LOVELY PROFESSIONAL UNIVERSITY

FINANCIAL DERIVATIVES

Edited By

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SYLLABUS

Financial Derivatives

Objectives: To make students aware of the concept of derivatives as a risk management instrument. The subject will give students a better understanding of complex financial product used for hedging. This subject will give students a better understanding of the stock indices around the world.

Sr. No.	Topic
1	**Introduction to derivatives:** Definition, Products, Participants and functions ,types of members to be included, types of derivatives, Exchange-traded vs. OTC derivatives markets, Derivatives market at NSE (including turnover)
2	**Introduction to futures:** Forward contracts, Limitations of forward markets, Introduction to futures, Distinction between futures and forwards contracts, Futures terminology.
3	**Introduction to options**: Option terminology, Distinction between Futures and options, Index derivatives. Valuation of options; Binomial Option Pricing Model; Black-Scholes model for Call Options.
4	**Application of Futures:** Payoff for derivatives contracts (futures and options), difference between trading securities and trading futures on individual securities, Use of Futures (Only simple strategies of hedging, speculation and arbitrage): Index futures, Stock futures.
5	**Application of Options:** Use of Options (Only simple strategies of hedging, speculation and arbitrage) : Index options, Stock options
6	**Trading:** Futures and options trading system, Entities in the trading system, Basis of trading, Corporate hierarchy, Order types and conditions
7	**The trader workstation**, The market watch window, Inquiry window, Placing orders on the trading system, Market spread/ combination order entry, Basket trading
8	**Clearing and settlement Marks:** Clearing entities, Clearing members, Clearing banks, Clearing mechanism, Settlement mechanism, Settlement of futures contracts, Settlement of options contracts, Special facility for settlement of institutional deals
9	**Risk Management Systems** (Volatility, types of margins & SPAN), Adjustments for corporate actions
10	**Regulatory framework:** Regulation for derivatives trading: L.C Gupta committee Report &J.R Varma committee report, Securities Contracts(Regulation) Act**,** Securities and Exchange Board of India Act, 1992

CONTENT

Unit 1:	Introduction to Derivatives *Rupesh Roshan Singh, Lovely Professional University*	1
Unit 2:	Derivatives Market in India *Mahesh Kumar Sarva, Lovely Professional University*	17
Unit 3:	Introduction to Forward Contracts *Rupesh Roshan Singh, Lovely Professional University*	34
Unit 4:	Introduction to Future Contracts *Mahesh Kumar Sarva, Lovely Professional University*	46
Unit 5:	Introduction to Options *Rupesh Roshan Singh, Lovely Professional University*	60
Unit 6:	Valuation and Pricing of Options *Mahesh Kumar Sarva, Lovely Professional University*	77
Unit 7:	Application of Futures Contracts *Rupesh Roshan Singh, Lovely Professional University*	100
Unit 8;	Application of Options *Mahesh Kumar Sarva, Lovely Professional University*	120
Unit 9:	Trading Futures and Option *Rupesh Roshan Singh, Lovely Professional University*	136
Unit 10:	The Trader Workstation *Mahesh Kumar Sarva, Lovely Professional University*	149
Unit 11:	Clearing and Settlement *Anand Thakur, Lovely Professional University*	167
Unit 12:	Risk Management of Financial Derivatives *Tanima Dutta, Lovely Professional University*	182
Unit 13:	Regulatory Framework *Anand Thakur, Lovely Professional University*	197
Unit 14:	Regulation and Securities Markets in India *Anand Thakur, Lovely Professional University*	216

Unit 1: Introduction to Derivatives

Notes

CONTENTS

Objectives

Introduction

1.1 Definitions of Derivatives

1.2 Products of Derivatives

1.2.1 Equity Derivatives

1.2.2 Interest Rate Derivatives

1.2.3 Commodity Derivatives

1.2.4 Foreign Exchange Derivatives

1.2.5 Credit Derivatives

1.3 Participants and Functions (Types of Members to be included)

1.3.1 Participants in a Derivative Market

1.3.2 Economic Function of the Derivative Market

1.4 Types of Derivatives

1.4.1 Popular Derivative Instruments

1.4.2 Other Types of Financial Derivatives

1.5 Exchange-traded vs. OTC Derivatives Markets

1.6 Summary

1.7 Keywords

1.8 Review Questions

1.9 Further Readings

Objectives

After studying this unit, you should be able to:

- State the definition and meaning of derivatives;
- Explain the various products of derivatives;
- Explain the participants and functions of derivatives;
- Identify the types of derivative;
- Discuss the difference in Exchange-traded vs. OTC derivatives markets.

Introduction

This unit will enable you to learn the basic concept of derivative as in recent decades, financial markets have been marked by excessive volatility. As foreign exchange rates, interest rates and commodity prices continue to experience sharp and unexpected movements, it has become increasingly important that corporations exposed to these risks be equipped to manage them effectively. Various sections and sub-sections of this unit cover the products, participants, functions and types of members to be included in mechanics of derivation. To make the learning easier, we will take the help of globally recognized best practices.

Notes

The word 'derivatives' originated in mathematics and refers to a variable that has been derived from another variable. For example, a measure of distance in kilometres could be derived from a measure of distance in miles by dividing by 1.61, or similarly a measure of temperature in Celsius could be derived from a measure of temperature in Fahrenheit. In financial sense, a derivative is a financial product which had been derived from a market for another product.

The first trade in derivatives was a culmination of legislative and legal efforts which had begun as early as 1995. In 1995, SEBI appointed a committee for exploring issues in introduction and creating a regulatory framework for a derivative market. After the committee report was tabled, the first action taken was to wet nurse the derivatives market by adopting the entire regulatory framework of securities. This was done simply by defining securities to include derivatives and removing certain prohibitions on forward and options trading. Thus, the entire framework of existing securities Regulations including anti-fraud and various disclosure obligations have become part of the regulations of derivatives in India. This is in sharp contrast to the introduction of futures on individual stocks in US. Their introduction took 20 years, endless bickering between the two regulators Securities Exchange Commission (SEC) and Commodity Futures Trading Commission (CFTC), a new Act which lays down several requirements for trading which should rightfully be in the bye-laws of the exchange/board of trade. By that standard, India managed to leapfrog as far as not just technology but also regulations. The introduction of new products has seen more of changes in the micro regulations like margining and default.

1.1 Definitions of Derivatives

The term "Derivative" indicates that it has no independent value, i.e., its value is entirely derived from the value of the underlying asset. The underlying asset can be securities, commodities, bullion currency, livestock or anything else. In other words, derivative means forward, futures, option or other hybrid contract of predetermined fixed duration, linked for the purpose of contract fulfilment to the value of a specified real or financial asset or to an index of securities.

The Securities Contracts (Regulation) Act 1956 defines "derivative" as under:

"Derivative" includes:

1. Security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or contract for differences or any other form of security.
2. A contract which derives its value from the prices, or index of prices of underlying securities.

The above definition conveys that:

1. The derivatives are financial products.
2. Derivative is derived from another financial instrument/contract called the underlying. In the case of Nifty futures, Nifty index is the underlying. A derivative derives its value from the underlying assets.
3. Accounting Standard SFAS 133 defines a derivative as, 'a derivative instrument financial derivative or other contract with all three of the following characteristics:
   (i) It has (1) one or more underlying, and (2) one or more notional amount or payments provisions or both. Those terms determine the amount of the settlement or settlements.
   (ii) It requires no initial net investment or an initial net investment that is smaller than would be required for other types of contract that would be expected to have a similar response to changes in market factors

Notes

(iii) Its terms require or permit net settlement. It can be readily settled net by means outside the contract or it provides for delivery of an asset that puts the recipients in a position not substantially different from net settlement.

The term "financial derivative" relates with a variety of financial instruments which include stocks, bonds, treasury bills, interest rate, foreign currencies and other hybrid securities. Financial derivatives include futures, forwards, options, swaps, etc. Futures contracts are the most important form of derivatives, which are in existence long before the term 'derivative' was coined. Financial derivatives can also be derived from a combination of cash market instruments or other financial derivative instruments. In fact, most of the financial derivatives are not revolutionary new instruments rather they are merely combinations of older generation derivatives and/or standard cash market instruments.

In the 1980s, the financial derivatives were also known as off-balance sheet instruments because no asset or liability underlying the contract was put on the balance sheet as such. Since the value of such derivatives depend upon the movement of market prices of the underlying assets, hence, they were treated as contingent asset or liabilities and such transactions and positions in derivatives were not recorded on the balance sheet. However, it is a matter of considerable debate whether off-balance sheet instruments should be included in the definition of derivatives. Which item or product given in the balance sheet should be considered for derivative is a debatable issue.

Did u know? The underlying securities for derivatives are:

(a) Commodities (Castor seed, Grain, Coffee Beans, Pepper, Potatoes)

(b) Precious Metals (Gold, Silver)

(c) Short-term Debt Securities (Treasury Bills)

(d) Interest Rate

(e) Common Shares/Stock

(f) Stock Index Value (NSE Nifty)

In brief, the term financial market derivative can be defined as a treasury or capital market instrument which is derived from, or bears a close relation to a cash instrument or another derivative instrument. Hence, financial derivatives are financial instruments whose prices are derived from the prices of other financial instruments.

Notes The subtle, but crucial, difference between derivatives and shares is that while shares are assets, derivatives are usually contracts (the major exception to this are warrants and convertible bonds, which are similar to shares in that they are assets). Well, we can define financial assets (e.g. shares, bonds) as: claims on another person or corporation; they will usually be fairly standardized and governed by the property or securities laws in an appropriate country. On the other hand, a contract is merely an agreement between two parties, where the contract details may not be standardized. Possibly because it is thought that investors may be wary of the woolly definition of derivatives, one frequently comes across references to "derivatives securities" or "derivatives products''. These "securities" and "products" sound fairly solid, tangible things. But in many cases there terms are rather inappropriately applied to what are really contracts.

Notes

Self Assessment

Fill in the blanks:

1. Derivatives are ……. whose value/price is dependent on the behaviour of the price of one or more basic underlying assets.
2. A derivative by itself does not constitute ……..... .
3. A …… is merely an agreement between two parties.

1.2 Products of Derivatives

In this section, we discuss a range of derivatives products that derive their values from the performance of five underlying asset classes: equity, fixed-income instrument, commodity, foreign currency and credit event. However, given the speed of financial innovation over the past two decades, the variety of derivatives products have grown substantially. Thus, a few key examples will be discussed below:

1.2.1 Equity Derivatives

Equity futures and options on broad equity indices are perhaps the most commonly cited equity derivatives securities. Way back in 1982, trading of futures based on S&P's composite index of 500 stocks began on the Chicago Mercantile Exchange (CME). Options on the S&P 500 futures began trading on the CME in the following year. Today, investors can buy futures based on benchmark stock indices in most international financial centres.

Index futures contract enable an investor to buy a stock index at a specified date for a certain price. It can be an extremely useful hedging tool.

Example: An investor with a stock portfolio that broadly matches the composition of the Hang Seng index (HSI), he will suffer losses should the HSI record a fall in market value in the near future. Since he means to hold the portfolio as a long term strategy, he is unwilling to liquidate the portfolio. Under such circumstances, he can protect his portfolio by selling HSI futures contracts so as to profit from any fall in price. Of course, if his expectations turned out to be wrong and the HSI rose instead, the loss on the hedge would have been compensated by the profit made on the portfolio.

Some investors prefer to purchase options on futures (or "futures options") instead of straight futures contracts. The option strike price is the specified futures price at which the future is traded if the option is exercised. For some market participants, the pricing of an option reveal valuable information about the likely future volatility of the returns of the underlying asset.

One commonly cited example is the Chicago Board Options Exchange Market Volatility Index (VIX index), which is calculated based on a range of options on the S&P 500 index. When investors are concerned about a potential drop in the US stock market, they buy the VIX index as an insurance against losses in the value of their portfolio. The more investors demand, the higher the price of the VIX. As such, the VIX can be viewed as an "investor fear gauge".

Other commonly traded equity derivatives are equity swaps. Under an equity swap contract, an investor pays the total return on a stock to his counterparty and receives in return a floating rate of interest. With this equity swap, the investor can hedge his equity position without giving up ownership of his share. At the same time, the party receiving equity return enjoys exposure without actually taking ownerships of shares.

Notes

1.2.2 Interest Rate Derivatives

One of the most popular interest rate derivatives is interest rate swap. In one form, it involves a bank agreeing to make payments to a counterparty based on a floating rate in exchange for receiving fixed interest rate payments. It provides an extremely useful tool for banks to manage interest rate risk. Given that banks' floating rate loans are usually tied closely to the market interest rates while their interest payments to depositors are adjusted less frequently, a decline in market interest rates would reduce their interest income but not their interest payments on deposits. By entering an interest rate swap contract and receiving fixed rate receipts from counterparty, banks would be less exposed to the interest rate risk. Meanwhile, interest rate futures contract allows a buyer to lock in a future investment rate.

Example: The Chicago Board of Trade offers federal funds futures contracts ranging from the current month to 24 months out. A by-product of these futures is that they provide useful information on the market expectations of future monetary policy decisions in the United States (Carlson, Craig, Higgins and Melick (2006)).

Caselet

Procter & Gamble entered into Interest Rate Swap

Procter & Gamble Co. is a Fortune 500, American global corporation based in Cincinnati, Ohio, that manufactures a wide range of consumer goods. In late 1993, Procter & Gamble financial managers, well known for actively managing their interest costs, expected interest rates to drop and went to Bankers Trust searching for aggressive interest rate swaps that would allow them to profit on these expectations. P&G told to Bankers Trust about ways of replacing a fixed-to-floating swap that was maturing. P&G's specific objective was to negotiate a new $100 million swap that would (a) again put it in the position of paying floating rates and (b) squeeze these to a minimum. Specifically, the company wanted to pay 40 basis points (0.4 of 1%) less than its standard, upper-crust commercial paper rate (then about 3.25% for six-month paper). Bankers Trust responded with a highly levered, extremely risky, and extremely complex five-year interest-rate swap agreement. In this the P&G had to pay 75 basis points less than rate of Commercial Paper, if the interest rates of 30 years and 5 years treasury bills will remain constant or go down. Five-year Treasury rates rose from 5% in early November 1993 to 6.7% on May 4, 1994. P&G's other benchmark, 30-year Treasury rates, went from about 6% to 7.3%. Because of large duration the effect of rise in interest rate on long term bonds was very high. When interest rates headed up, Procter & Gamble's treasurer realized the magnitude of the company's potential derivatives losses and decided to get out of the swap. Because of the intricate complexities and linked derivatives of the agreement, however, P&G lost $157 million to lock-in interest rates (which were 1,412 basis points (14.12%) above the commercial paper rate) in only six months of a five year contract. When interest rates headed up, Bankers' trust entered into another contract with P& G - a wedding band. When this strategy also failed, it led P& G to pay even higher rate of interest from 14.12% above Commercial Paper (CP) to 16.40% above CP. CEO Edwin Artzt, called the swaps "a violation of the company's policy against speculative financial transactions" and banned all leveraged swaps. As the Bankers Trust had suggested the contracts, P& G blamed them for the losses.

Source: http://www.iitk.ac.in/infocell/announce/convention/papers/Colloquium-03-Swati%20Khatkale%20final.pdf

Notes

1.2.3 Commodity Derivatives

The earliest derivatives markets have been associated with commodities, driven by the problems about storage, delivery and seasonal patterns. But modern day commodity derivatives markets only began to develop rapidly in the 1970s. During that time, the break-up of the market dominance of a few large commodity producers allowed price movements to better reflect the market supply and demand conditions. The resulting price volatility in the spot markets gave rise to demand of commodity traders for derivatives trading to hedge the associated price risks.

Example: Forwards contracts on Brent and other grades of crude became popular in the 1970s following the emergence of the Organisation of Petroleum Exporting Countries. Deregulations of the energy sector in the United States since the 1980s also stimulated the trading of natural gas and electrical power futures on the New York Mercantile Exchange (NYMEX) in the 1990s.

1.2.4 Foreign Exchange Derivatives

The increasing financial and trade integration across countries have led to a strong rise in demand for protection against exchange rate movements over the past few decades. A very popular hedging tool is forward exchange contract. It is a binding obligation to buy or sell a certain amount of foreign currency at a pre-agreed rate of exchange on a certain future date. Consider a Korean shipbuilder who expects to receive a $1 million payment from a US cruise company for a boat in 12 months. Suppose the spot exchange rate is 1,200 won per dollar today. Should the won appreciate by 10 per cent against the dollar over the next year, the Korean shipbuilder will receive only 1,090 million of won (some 109 million of won less than he would have received today). But if the shipbuilder can hedge against the exchange risk by locking in buying dollars forwards at the rate of say 1,100 won per dollar.

For thinly trade currencies or currencies of those countries with restrictions on capital account transactions, the profit or loss resulting from the forwards transaction can be settled in an international currency. This is the so-called non-deliverable forwards contract, and very often they are traded offshore.

Another type of foreign exchange derivatives are cross-currency swaps. This involves two parties exchanging payments of principal (based on the spot rate at inception) and interest in different currencies. According to many market participants, having a liquid cross-currency swap market is an important for local currency bond market developments. This is because such instruments allow foreign borrowers in local bond markets to swap back their proceeds to their own currencies while hedging against the interest rate risk.

1.2.5 Credit Derivatives

A credit derivative is a contract in which a party (the credit protection seller) promises a payment to another (the credit protection buyer) contingent upon the occurrence of a credit event with respect to a particular entity (the reference entity). A credit event in general refers to an incident that affects the cash flows of a financial instrument (the reference obligation). There is no precise definition, but in practice, it could be filing for bankruptcy, failing to pay, debt repudiation or moratorium.

The fastest growing type of credit derivatives over the past decade is credit default swap (CDS). In essence, it is an insurance policy that protects the buyer against the loss of principal on a bond in case of a default by the issuer. The buyer of CDS pays a periodic premium to the seller over the life of the contract. The premium reflects the buyer's assessment of the probability of default and the expected loss given default.

Notes

Caution In the event of a credit incident, the buyer has a right to demand compensation from the seller.

In its simplest form, the CDS is written with respect to one single reference entity, the so called single-name CDS. Some data providers compile indices of a basket of single-name CDSs of similar ratings (e.g., the S&P US Investment Grade CDS Index consists of 100 equally weighted investment grade US corporate credits). These index trenches give investors the opportunity to take on exposures to specific segments of the CDS index default loss distribution.

Self Assessment

State whether the following statements are true or false:

4. Index futures contract enable an investor to buy a stock index at a specified date for a certain price.
5. The option strike price is the specified futures price at which the future is traded if the option is exercised.
6. Interest rate futures contract doesn't permit a buyer to lock in a future investment rate.

1.3 Participants and Functions (Types of Members to be included)

Banks, financial institutions, corporate, brokers and individuals are the participants of the derivative market in India. It is observed that financial derivatives are those assets whose values are determined by the value of some other assets, called as the underlying. Presently, there are bewilderingly complex varieties of derivatives already in existence, and the markets are innovating newer and newer ones continuously. Now let us discuss the various participants and economic functions of derivative market in the following sub-sections:

1.3.1 Participants in a Derivative Market

The derivatives market is similar to any other financial market and has following three broad categories of participants:

- ***Hedgers:*** These are investors with a present or anticipated exposure to the underlying asset which is subject to price risks. Hedgers use the derivatives markets primarily for price risk management of assets and portfolios.

  Example: An importer has to pay US $ to buy goods and rupee is expected to fall to ₹ 50/$ from ₹ 48/$, then the importer can minimize his losses by buying a currency future at ₹ 49/$.

- ***Speculators:*** These are individuals who take a view on the future direction of the markets. They take a view whether prices would rise or fall in future and accordingly buy or sell futures and options to try and make a profit from the future price movements of the underlying asset.

  Example: If you will the stock price of Reliance is expected to go up to ₹ 400 in 1 month, one can buy a 1 month future of Reliance at ₹ 350 and make profits.

- ***Arbitragers:*** These are the third important participants in the derivatives market. They take positions in financial markets to earn risk less profits. The arbitragers take short and long positions in the same or different contracts at the same time to create a position which can generate a risk less profit.

Notes

Example: A futures price is simply the current price plus the interest cost. If there is any change in the interest, it presents an arbitrage opportunity.

1.3.2 Economic Function of the Derivative Market

The derivatives market performs a number of economic functions. In this section, we discuss some of them.

- ***Detection of Prices:*** Prices in an organized derivatives market reflect the perception of the market participants about the future and lead the prices of underlying to the perceived future level. The prices of derivatives converge with the prices of the underlying at the expiration of the derivative contract. Thus derivatives help in discovery of future as well as current prices.
- ***Transfer of Risk:*** The derivatives market helps to transfer risks from those who have them but do not like them to those who have an appetite for them.
- ***Liquidity and Volume Trading:*** Third, derivatives due to their inherent nature are linked to the underlying cash markets. With the introduction of derivatives, the underlying market witnesses higher trading volumes. This is because of participation by more players who would not otherwise participate for lack of an arrangement to transfer risk.
- ***Encourages participating more people:*** An important incidental benefit that flows from derivatives trading is that it acts as a catalyst for new entrepreneurial activity. The derivatives have a history of attracting many bright, creative, well-educated people with an entrepreneurial attitude. They often energize others to create new businesses, new products and new employment opportunities, the benefit of which are immense.

In a nut shell, derivatives markets help increase savings and investment in the long run. Transfer of risk enables market participants to expand their volume of activity.

Self Assessment

Fill in the blanks:

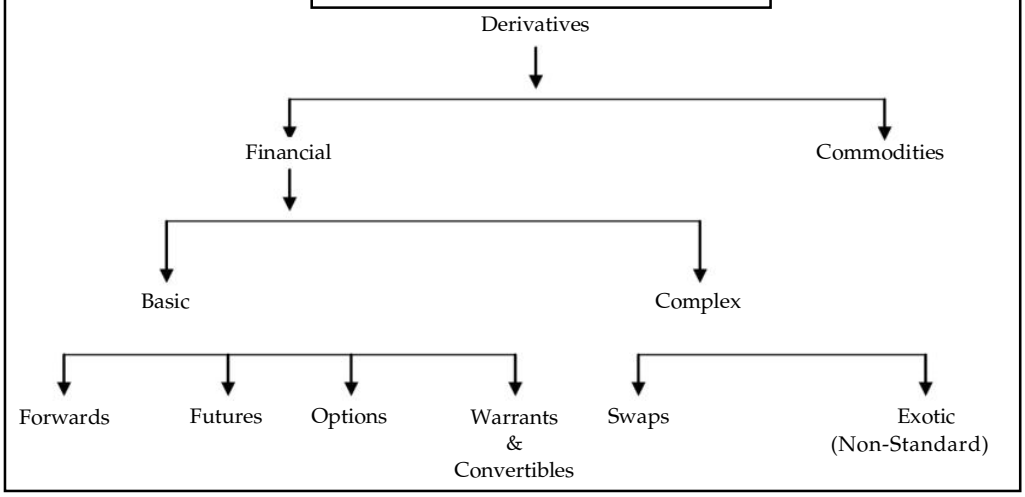
7. In a ……. derivatives, the underlying instrument is a commodity which may be wheat, cotton, pepper, sugar, jute, turmeric, corn, soybeans, crude oil, natural gas, gold, silver, copper and so on.
8. In a ……derivative, the underlying instrument may be treasury bills, stocks, bonds, foreign exchange, stock index, gilt-edged securities, cost of living index, etc.
9. A …….. 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.

1.4 Types of Derivatives

It is observed that financial derivatives are those assets whose values are determined by the value of some other assets, called as the underlying. Presently, there are bewilderingly complex varieties of derivatives already in existence, and the markets are innovating newer and newer ones continuously. For example, various types of financial derivatives based on their different properties like, plain, simple or straightforward, composite, joint or hybrid, synthetic, leveraged, mildly leveraged, customized or OTC traded, standardized or organized exchange traded, etc., are available in the market.

Notes

Figure 1.1: Classification of Derivatives



Due to complexity in nature, it is very difficult to classify the financial derivatives, so in the present context, the basic financial derivatives which are popular in the market have been described in brief. The details of their operations, mechanism and trading, will be discussed in the forthcoming respective units. In simple form, the derivatives can be classified into different categories which are shown in the Figure 1.1.

One form of classification of derivative instruments is between commodity derivatives and financial derivatives. The basic difference between these is the nature of the underlying instrument or asset. In a commodity derivatives, the underlying instrument is a commodity which may be wheat, cotton, pepper, sugar, jute, turmeric, corn, soybeans, crude oil, natural gas, gold, silver, copper and so on. In a financial derivative, the underlying instrument may be treasury bills, stocks, bonds, foreign exchange, stock index, gilt-edged securities, cost of living index, etc. It is to be noted that financial derivative is fairly standard and there are no quality issues whereas in commodity derivative, the quality may be the underlying matters. However, the distinction between these two from structure and functioning point of view, both are almost similar in nature.

Another way of classifying the financial derivatives is into basic and complex derivatives. In this, forward contracts, futures contracts and option contracts have been included in the basic derivatives whereas swaps and other complex derivatives are taken into complex category because they are built up from either forwards/futures or options contracts, or both. In fact, such derivatives are effectively derivatives of derivatives.

1.4.1 Popular Derivative Instruments

The most popularly used derivatives contracts are Forwards, Futures, Options and Swaps, which we shall discuss in detail later. Here we take a brief look at various derivatives contracts that have come to be used.

1. ***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. The rupee-dollar exchange rates is a big forward contract market in India with banks, financial institutions, corporate and exporters being the market participants.

Caution Forward contracts are generally traded on Over The Counter Exchange.

Notes

2. ***Futures:*** A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. Futures contracts are special types of forward contracts in the sense that the former are standardized exchange-traded contracts. Unlike forward contracts, the counterparty to a futures contract is the clearing corporation on the appropriate exchange. Futures often are settled in cash or cash equivalents, rather than requiring physical delivery of the underlying asset. Parties to a Futures contract may buy or write options on futures.

3. ***Options:*** An option represents the right (but not the obligation) to buy or sell a security or other asset during a given time for a specified price (the "strike price"). 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.

4. ***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. Swaps generally are traded OTC through swap dealers, which generally consist of large financial institution, or other large brokerage houses. There is a recent trend for swap dealers to mark to market the swap to reduce the risk of counterparty default. The two commonly used swaps are:

   (a) *Interest rate swaps:* These entail swapping only the interest related cash flows between the parties in the same currency.

   (b) *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. Swaps may involve cross-currency payments (U.S. Dollars vs. Mexican Pesos) and cross market payments, e.g., U.S. short-term rates vs. U.K. short-term rates.

1.4.2 Other Types of Financial Derivatives

1. ***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.

2. ***LEAPS:*** The acronym LEAPS means Long-term Equity Anticipation Securities. These are options having a maturity of up to three years.

3. ***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.

Self Assessment

Fill in the blanks:

10. A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a ……... .

11. An …….. represents the right (but not the obligation) to buy or sell a security or other asset during a given time for a specified price.

12. …… are private agreements between two parties to exchange cash flows in the future according to a prearranged formula.

13. Basket options are options on …… of underlying assets.

Notes

1.5 Exchange-traded vs. OTC Derivatives Markets

Derivatives that trade on an exchange are called exchange traded derivatives, whereas privately negotiated derivative contracts are called OTC contracts. The OTC derivatives markets have witnessed rather sharp growth over the last few years, which have accompanied the modernization of commercial and investment banking and globalization of financial activities. The recent developments in information technology have contributed to a great extent to these developments. While both exchange-traded and OTC derivative contracts offer many benefits, the former have rigid structures compared to the latter. It has been widely discussed that the highly leveraged institutions and their OTC derivative positions were the main cause of turbulence in financial markets in 1998. These episodes of turbulence revealed the risks posed to market stability originating in features of OTC derivative instruments and markets.

The first exchange-traded financial derivatives emerged in 1970's due to the collapse of fixed exchange rate system and adoption of floating exchange rate systems. As the system broke down currency volatility became a crucial problem for most countries. To help participants in foreign exchange markets hedge their risks under the new floating exchange rate system, foreign currency futures were introduced in 1972 at the Chicago Mercantile Exchange. In 1973, the Chicago Board of Trade (CBOT) created the Chicago Board Options Exchange (CBOE) to facilitate the trade of options on selected stocks. The first stock index futures contract was traded at Kansas City Board of Trade. Currently the most popular stock index futures contract in the world is based on S&P 500 index, traded on Chicago Mercantile Exchange. During the mid eighties, financial futures became the most active derivative instruments generating volumes many times more than the commodity futures. Index futures, futures on T-bills and EuroDollar futures are the three most popular futures contracts traded today. Other popular international exchanges that trade derivatives are LIFFE in England, DTB in Germany, SGX in Singapore, TIFFE in Japan, MATIF in France, Eurex etc.

Did u know? The OTC derivatives have grown faster than the exchange-traded contracts in the recent years.

Table 1.1 gives a bird's eye view of these contracts as available worldwide on several exchanges

Table 1.1: Spectrum of Derivative Contracts Worldwide

Underlying Asset	Exchange traded futures	Exchange traded options	OTC swap	OTC forward	OTC option
Equity	Index future Stock future	Index option Stock option	Equity swap	Back to back repo agreement	Stock options Warrants
Interest rate	Interest rate futures linked to MIBOR	Options on futures	Interest rate swaps	Forward rate agreement	Interest rate caps, floors & collars. Swaptions
Credit	Bond future	Option on Bond future	Credit default swap Total return swap	Repurchase agreement	Credit default option
Foreign exchange	Currency future	Option on currency future	Currency swap	Currency forward	Currency option

Notes

The above list is not exhaustive. Several new and innovative contracts have been launched over the past decade around the world including option contracts on volatility indices.

The OTC derivatives markets have the following features compared to exchange-traded derivatives:

1. The management of counter-party (credit) risk is decentralized and located within individual institutions,
2. There are no formal centralized limits on individual positions, leverage, or margining,
3. There are no formal rules for risk and burden-sharing,
4. There are no formal rules or mechanisms for ensuring market stability and integrity, and for safeguarding the collective interests of market participants, and
5. The OTC contracts are generally not regulated by a regulatory authority and the exchange's self-regulatory organization, although they are affected indirectly by national legal systems, banking supervision and market surveillance.

Some of the features of OTC derivatives markets embody risks to financial market stability. The following features of OTC derivatives markets can give rise to instability in institutions, markets, and the international financial system:

1. The dynamic nature of gross credit exposures;
2. Information asymmetries;
3. The effects of OTC derivative activities on available aggregate credit;
4. The high concentration of OTC derivative activities in major institutions; and
5. The central role of OTC derivatives markets in the global financial system.

Notes Over the Counter (OTC) Derivative Contracts Derivatives that trade on an exchange is called exchange traded derivatives, whereas privately negotiated derivative contracts are called OTC contracts. The OTC derivatives markets have the following features compared to exchange-traded derivatives: (i) The management of counter-party (credit) risk is decentralized and located within individual institutions, (ii) There are no formal centralized limits on individual positions, leverage, or margining, (iii) There are no formal rules for risk and burden-sharing, (iv) There are no formal rules or mechanisms for ensuring market stability and integrity, and for safeguarding the collective interests of market participants, and (v) The OTC contracts are generally not regulated by a regulatory authority and the exchange's self-regulatory organization. They are however, affected indirectly by national legal systems, banking supervision and market surveillance.

Instability arises when shocks, such as counter-party credit events and sharp movements in asset prices that underlie derivative contracts occur, which significantly alter the perceptions of current and potential future credit exposures. When asset prices change rapidly, the size and configuration of counter-party exposures can become unsustainably large and provoke a rapid unwinding of positions.

There has been some progress in addressing these risks and perceptions. However, the progress has been limited in implementing reforms in risk management, including counter-party, liquidity and operational risks, and OTC derivatives markets continue to pose a threat to international financial stability. The problem is more acute as heavy reliance on OTC derivatives

creates the possibility of systemic financial events, which fall outside the more formal clearing house structures. Moreover, those who provide OTC derivative products, hedge their risks through the use of exchange traded derivatives. In view of the inherent risks associated with OTC derivatives, and their dependence on exchange traded derivatives, Indian law considers them illegal.

Task Mr. Ramesh is speculating on SBI (currently trading at ₹ 850) and is holding one share of SBI. Three-month short futures on SBI are ₹ 840 while a put option at ₹ 842 is also available at premium of ₹ 3. What should Ramesh do? (For simplicity, there is no margin requirement under futures trading).

Self Assessment

State whether the following statements are true or false:

14. Privately negotiated derivative contracts are called exchange traded derivatives.

15. The OTC contracts are generally not regulated by a regulatory authority.

Case Study

Changing Trends of Derivatives

During the derivatives crisis of the early and mid-1990s, big firms like Gibson Greetings and Procter & Gamble had to bear immense losses as a result of derivatives speculation, while Orange County and Calif were forced to file for bankruptcy as their treasurer's failed in their derivatives bets. It was the time when many felt that corporate treasurers and others were lured in derivatives betting by Wall Street salesmen who had a little more understanding about these products than the customers. But these days, derivatives rarely make news.

According to Wharton accounting professor, Wayne Guay, the way derivatives are being used in the market has matured. He feels that twenty years ago derivatives were not at all common in the market, but today many derivatives contracts are standardised, well understood and economically priced. In order to understand the amount of risk faced by companies through their derivatives bets, Guay and SP Kothari, an accounting professor at MIT's Sloan School of Management examined the non-financial firms that used derivatives.

The result revealed that for most of the firms the quantity of derivatives that they used was quite insignificant when compared to how big these companies were.

Questions:

1. Comment on the changing trends of derivatives in the last decade.

2. 'The Indian derivatives market has witnessed a number of changes in the recent past. After the introduction of futures and options on individual stocks, the market is all set to get a face-lift with the introduction of currency options'. Comment.

Source: Madhu Vij. "International Financial Management". Excel Books (2010).

Notes

1.6 Summary

- Derivatives are the instruments which derive their values from the underlying assets.
- The underlying assets may be financial assets like individual stock, stock indices, interest rate, currencies, etc. or commodities like metals, cotton, coffee, etc.
- Common derivatives include options, forward contracts, futures contracts, and swaps.
- 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.
- A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price.
- An option represents the right (but not the obligation) to buy or sell a security or other asset during a given time for a specified price (the "Strike" price).
- Options are of two types-calls and puts.
- Swaps are private agreements between two parties to exchange cash flows in the future according to a prearranged formula.
- Derivatives that trade on an exchange are called exchange traded derivatives, whereas privately negotiated derivative contracts are called OTC contracts.
- The OTC derivatives markets have witnessed rather sharp growth over the last few years, which have accompanied the modernization of commercial and investment banking and globalization of financial activities.

1.7 Keywords

Basket Option: A type of option whose underlying asset is a basket of commodities, securities, or currencies.

Currency Swaps: An arrangement in which two parties exchange specific amounts of different currencies initially, and a series of interest payments on the initial cash flows are exchanged.

Derivative: A derivative security is a financial contract whose value is derived from the value of something else, such as a stock price, a commodity price, an exchange rate, an interest rate, or even an index of prices.

Exchange Traded Derivatives: Derivatives that trade on an exchange are called exchange traded derivatives.

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 at a certain time in the future at a certain price.

Interest Rate Swaps: An agreement between two parties (known as counter-parties) where one stream of future interest payments is exchanged for another based on a specified principal amount.

Options: An option represents the right (but not the obligation) to buy or sell a security or other asset during a given time for a specified price (the "strike "price).

OTC contracts: Privately negotiated derivative contracts are called OTC contracts.

Notes

Swaps: Swaps are private agreements between two parties to exchange cash flows in the future according to a prearranged formula.

1.8 Review Questions

1. Explain the term 'derivatives', using suitable examples.
2. What are the underlying assets for a derivative instrument?
3. What are the products of derivatives?
4. Discuss the participants of derivatives in the trading context.
5. Explain the different types of derivatives along with their features, in brief.
6. 'Derivatives are effective risk management tools'. Comment on the statement.
7. 'Future contracts are obligations, whereas options are rights'. Do you agree?
8. Bring out the similarities and dissimilarities between Forwards, Futures, Options and Swaps.
9. Can you think of a cash market in which options or futures could be useful but does not yet exist? Explain.
10. Highlight the various functions of derivatives.
11. What is Exchange-traded and over the contract derivatives?
12. Briefly, explain the Exchange-traded vs. OTC derivatives markets.

Answers: Self Assessment

1.	Financial contracts	2.	Ownership
3.	Contract	4.	True
5.	True	6.	False
7.	Commodity	8.	Financial
9.	Forward	10.	Certain price
11.	Option	12.	Swaps
13.	Portfolios	14.	False
15.	True		

1.9 Further Readings

Books

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Notes

Unit 2: Derivatives Market in India

CONTENTS

Objectives
Introduction
2.1 Indian Derivatives Market
2.1.1 Important Eligibility/Regulatory Conditions Specified by SEBI
2.2 Derivatives Market at NSE (including Turnover)
2.2.1 NEAT Trading System
2.2.2 Start of Derivative Trading (NSE)
2.2.3 Functioning of Derivative at NSE
2.2.4 Rules of Derivative Trading
2.3 BSE – Start of Derivative Trading
2.3.1 Functioning of Derivative at BSE
2.3.2 Comparison between NSE and BSE
2.4 NIFTY
2.5 SENSEX
2.5.1 Sensex Index
2.5.2 Trading in Sensex Futures
2.6 Application of Index
2.6.1 Index Derivatives
2.6.2 Index Funds
2.6.3 Exchange Traded Funds
2.7 Summary
2.8 Keywords
2.9 Review Questions
2.10 Further Readings

Objectives

After studying this unit, you should be able to:

- Discuss about the Indian derivatives market;
- Explain the derivatives market at NSE and BSE;
- Discuss about the NIFTY and SENSEX;
- Describe the application of index.

Introduction

In the previous unit, we dealt with the concept of derivatives. The unit also discussed about the products, participants, functions and types of members to be included in derivation mechanism. This unit will helps you to understand the derivatives market in India i.e. derivatives market at

Notes

NSE, BSE, NIFTY and SENSEX. The various section and sub-section of this units will also summarises the important eligibility/regulatory conditions specified by SEBI, comparison between NSE and BSE, Index derivatives and Exchange Traded Funds. To make the learning easier, we will take the help of globally recognised best practices.

Derivative products like futures and options on Indian stock markets have become important instruments of price discovery, portfolio diversification and risk hedging in recent times. The volumes in derivative markets, especially in the case of National Stock Exchange (NSE), have shown a tremendous increase and presently the turnover in derivative markets is much higher than the turnover in spot markets. At the NSE, the total turnover in the cash segment was ₹ 6,95,049 crore during April-September 2005. The turnover in the NSE's derivative segment continued to be higher than in the cash segment. It increased by 59.2 per cent to ₹ 17, 55,790 crore during April-September 2005. Hence, it becomes increasingly important to know its intricacies. The most notable of development in the history of secondary segment of the Indian stock market is the commencement of derivatives trading in June, 2000.

The SEBI approved derivatives trading based on futures contracts at National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) in accordance with the rules/bye-laws and regulations of the stock exchanges. To begin with, the SEBI permitted equity derivatives named stock index futures. The BSE introduced on 9 June, 2000 stock index futures based on the sensitive Index named BSX, and NSE started on June 12, 2000 stock index future based on its index S&P CNX NIFTY in the name of NFUTIDX NIFTY.

2.1 Indian Derivatives Market

The Indian Derivatives markets can be broadly categorised into two markets namely; financial derivatives markets and commodities futures markets. Financial derivatives markets deal with the financial futures instruments like stock futures, index futures, stock options, index options, interest rate futures, currency forwards and futures, financial swaps, etc. whereas commodity futures markets deal with commodity instruments like agricultural products; food grains, cotton and oil; metals like gold, silver, copper and steel and other assets like live stocks, vegetables and so on.

Financial derivatives markets in India are regulated and controlled by the Securities and Exchange Board of India (SEBI). The SEBI is authorised under the SEBI Act to frame rules and regulations for financial futures trading on the stock exchanges with the objective to protect the interest of the investors in the market.

Some of the other financial derivatives like currency options and futures and interest rate futures are controlled by the Reserve Bank of India (RBI). These are dealt on Over-the-Counter (OTC) markets. Financial futures on interest rate include both short-term interest rate and long-term interest rate forwards. Currencies include options and forwards. Since the RBI is the apex body to regulate currencies and interest rates in India, hence, financial derivatives relating to foreign currencies and interest rates are generally come under the RBI regulation.

Notes Major stock exchanges in India, under the regulation of the SEBI, trade in two kinds of futures products, namely equity and carry forwards.

Equity futures include stock futures, index futures, stock options and index options. Currently these are traded on National Stock Exchange and Bombay Stock Exchange.

Notes

Example: Companies on which options and futures are available are ACC, SBI, CIPLA, HPCL, TELCO, GRASIM, Dr. Reddy, Lab, HLL, HDFC, Hero Honda, etc.

Commodity futures markets are regulated in India by Forward Market Commission (FMC). The Commission is entrusted with to regulate commodities futures trading in India. Products like hessian, potatoes, pepper, cotton, etc. are traded on Coimbatore Commodity Exchange and Calcutta Commodity Exchange.

Did u know? Recently the Central Government has allowed futures trading on 54 new commodities of different categories to be eligible for trading on exchanges.

2.1.1 Important Eligibility/Regulatory Conditions Specified by SEBI

Following are important eligibility/regulatory conditions specified by SEBI:

- Derivative trading to take place through an on screen based trading system.
- The derivatives exchange/segment should have on-line surveillance capability to monitor positions, prices and volumes on a real time basis so as to deter market manipulation.
- The derivatives exchange/segment should have arrangements for dissemination of information about trades, quantities and quotes on a real time basis through at least two information vending networks, which are easily accessible to investors across the country.
- The derivatives exchange/segment should have arbitration and investor grievances redressal mechanism operative from all the four areas/regions of the country.
- The derivatives exchange/segment should have satisfactory system of monitoring investor com plaints and preventing irregularities in trading.
- The derivative segment of the exchange would have a separate Investor Protection Fund.
- The clearing corporation/house will perform full novation, i.e., the clearing corporation/house will interpose itself between both legs of every trade, becoming the legal counterparty to both or alternatively should provide an unconditional guarantee for settlement of all trades.
- The clearing corporation/house should have the capacity to monitor the overall position of members across both derivatives market and the underlying securities market for those members who are participating in both.
- The level of initial margin on index futures contracts will be related to the risk of loss on the position. The concept of value-at-risk will be used in calculating the required level of initial margins.

  Caution The initial margins should be large enough to cover the one-day loss that can be encountered on the position on 99 percent of the days.

- The clearing corporation/house will establish facilities for electronic funds transfer (EFT) for swift movement of margin payments.
- In the event of a member defaulting in meeting its liabilities, the clearing corporation/house shall transfer client positions and assets to another solvent member or close-out all open positions.

Notes

- The clearing corporation/house should have capabilities to segregate initial margins deposited by clearing members for trades on their own account and on account of his client. The clearing corporation/house will hold the clients' margin money in trust for the client purposes only and should not allow its diversion for any other purpose.
- The clearing corporation/house should have a separate Trade Guarantee Fund for the trades executed on derivative exchange/segment.

Self Assessment

Fill in the blanks:

1. Financial derivatives markets in India are regulated and controlled by the .....
2. Currencies include options and .....
3. Commodity futures markets are regulated in India by .....

2.2 Derivatives Market at NSE (including Turnover)

National Stock Exchange was established in 1993 to encourage stock exchange reform through system modernisation and competition. The reach of NSE has been extended to twenty one cities of which six cities do not have stock exchanges of their own. By end 1996, NSE planned to extend its network cities across the country. It is an electronic screen based system where members have equal access and equal opportunity of trade irrespective of their location in different parts of the country as they are connected through a satellite network.

The system helps to integrate the national market and provide a modem system with a complete audit trial of all transactions. Instantaneous matching of trades effectively prevents circular trading which has been one of the mechanisms of pre-rigging. A member's office located anywhere in the country is connected to the central computer through very small aperture terminals (VASTs). Today, all stock exchanges in India follow screen-based trading system.

NSE was the first stock exchange in the country to provide nation-wide order-driven, screen-based trading system. NSE model was gradually emulated by all other stock exchanges in the country.

Did u know? India's experience with the equity derivatives market has been extremely positive. The derivatives turnover on the NSE has surpassed the equity market turnover. The turnover of derivatives on the NSE increased from ₹ 23,654 million in 2000–2001 to ₹ 292,482,211 million in 2010–2011, and reached ₹ 157,585,925 million in the first half of 2011–2012. The average daily turnover in this market segment on the NSE was ₹ 1,151,505 million in 2010–2011 compared to ₹ 723,921 in 2009–2010.

2.2.1 NEAT Trading System

The trading system at NSE known as the National Exchange for Automated Trading (NEAT) system is an anonymous order-driven system and operates on a strict price/time priority. It enables members from across the country to trade simultaneously with enormous ease and efficiency. NEAT has lent considerable depth in the market by enabling large number of members all over the country to trade simultaneously and consequently narrowed the spreads significantly. A single consolidated order book 'for each stock displays, on a real time basis, buy and sell

Notes

orders originating from all over the country. The book stores only limit orders, which are orders to buy or sell shares at a stated quantity and stated price. The limit orders are executed only if the price quantity conditions match. Thus, the NEAT system provides an Open Electronic Consolidated Limit Order Book (OECLOB).

The trading system provides tremendous flexibility to the users in terms of kinds of orders that can be placed on the system. Several time-related (Good-till-Cancelled, Good-till-Day, Immediate-or-Cancel), price related (buy/sell limit and stop-loss orders) or volume-related (All-or-None, Minimum Fill, etc.) conditions can be easily built into an order. Orders are sorted and matched automatically by the computer keeping the system transparent, objective and fair. The trading system also provides complete market information on-line, which is updated on real time basis.

As of December 1996, there were roughly 1200 companies traded on the NSE, as against 5,999 companies listed on the BSE as on the same date. Of the 1,200 odd companies traded on the NSE, 535 were listed and the remaining was permitted securities.

As of January 1997, the market capitalisation of the NSE was ₹ 2 trillion. The total net turnover on the exchange was ₹ 2,16,483 crore in 1996. This was more than nine times higher than the ₹ 27,814 crore transacted during 1995. Since November 1995, trading volumes on the NSE have been consistently higher than those on the BSE. On average, trading volumes on the NSE are slightly more than twice of those on the BSE.

There were 541 companies listed on the National Stock Exchange in 1997 as against 407 in January 1996. When the NSE commenced trading in the equity segment in November 1994, there were no companies listed on the NSE. The segment then comprised of 200-odd permitted companies. During 1995-96, NSE relaxed its listing requirements to cater to wider population of companies' seeking listing on the exchange.

Caution As per the guidelines issued in August 1995, a company seeking listing on the NSE should have a minimum capital of ₹ 10 crore and a market capitalisation of at least ₹ 25 crore if it is listed on any other stock exchange.

The earlier requirement for a listed company seeking listing on the NSE was a minimum market capitalisation of ₹ 50 crore. Companies seeking listing on the NSE should have a minimum track record of profitability of three years.

The total number of VSATs (Very Small Aperture Terminals) installed by the NSE was 1,102 as on 31 December. The total number of cities spanned by these was 66, out of which 49 have no stock exchanges. Mumbai has the highest number of VSATs at 346, followed by Delhi with 273 and Calcutta (Kolkata) with 127.

Today, the NSE, since the commencement of its operations in Wholesale Debt Market (WDM) segment on June 30, 1994 and in Capital Market (CM) segment on November 3, 1994, has expanded its trade operations to more than 100 cities in India and has come to acquire the status of a premier stock exchange in the country. The trading activity on the WDM segment, which covers a variety of debt instrument, has gradually gone up.

Caution India's fiscal problems have implied a large volume of issuance of central government debt, which dominates the table. This has fuelled tremendous growth of turnover on the debt market.

Notes

2.2.2 Start of Derivative Trading (NSE)

The derivatives trading on the NSE commenced with S&P CNX Nifty index futures on June 12, 2000. The trading in index options commenced on June 4, 2001 and trading in options on individual securities commenced on July 2, 2001. Single stock futures were launched on November 9, 2001. Today, both in terms of volume and turnover, NSE is the largest derivatives exchange in India. Currently, the derivatives contracts have a maximum of 3-month expiration cycles. Three contracts are available for trading, with 1 month, 2 months and 3 months expiry. A new contract is introduced on the next trading day following the expiry of the near month contract.

NSE has the following derivative products given in table 2.1:

Table 2.1: Derivative Products at NSE

Products	Index Futures	Index Options	Futures on Individual Securities	Options on Individual Securities
Underlying Instrument	S&P CNX Nifty	S&P CNX Nifty	30 securities stipulated by SEBI	30 securities stipulated by SEBI
Type		European		American
Trading Cycle	Maximum of 3-month trading cycle. At any point in time, there will be 3 contract available: 1. near month 2. mid month 3. far month duration	Same as index futures	Same as index futures	Same as index futures
Expiry Day	Last Thursday of the expiry month	Same as index futures	Same as index futures	Same as index futures
Contract Size	Permitted lot size is 200 & multiples thereof	Same as index futures	As stipulated by NSE (not less than ₹ 2 lacs)	As stipulated by NSE (not less than ₹ 2 lacs)
Price Steps	₹ 0.05	₹ 0.05		
Base Price-First day of trading	Previous day closing Nifty value	Theoretical value of the options contract arrived at base on black-scholes models	Previous day closing value of underlying security	Same as index futures
Base Price-Subsequent	Daily settlement price	Daily close price	Daily settlement price	Same as index futures
Price Bonds	Operating ranges are kept at + 10%	Operating ranges for are kept at 99% of the base price	Operating ranges are kept at + 20%	Operating ranges for are kept at 99% of the base price
Quantity Freeze	20,000 units or greater	20,000 units or greater	Lower of 1% of marketwide position limit stipulated for open position of ₹ 5 cores	Same as individual futures

Task The introduction of index futures trading on NSE at the beginning of 2000 was described as India's derivatives explosion. Much of that hoopla has died now. Contrary to their initial promise, derivatives never really picked up in the country. What went wrong? Elucidate with examples.

Notes

2.2.3 Functioning of Derivative at NSE

NSE admits members on its derivatives segment in accordance with the rules and regulations of the exchange and the norms specified by SEBI.

Did u know? NSE follows 2-tier membership structure stipulated by SEBI to enable wider participation.

Those interested in taking membership on F&O segment are required to take membership of CM and F&O segment or CM, WDM and F&O segment. Trading and clearing members are admitted separately. Essentially, a clearing member (CM) does clearing for all his trading members (TMs), undertakes risk management and performs actual settlement. There are three types of CMs:

- ***Self Clearing Member:*** A SCM clears and settles trades executed by him only either on his own account or on account of his clients.
- ***Trading Member Clearing Member:*** TM—CM is a CM who is also a TM. TM—CM may clear and settle his own proprietary trades and client's trades as well as clear and settle for other TMs.
- ***Professional Clearing Member:*** PCM is a CM who is not a TM. Typically, banks or custodians could become a PCM and clear and settle for TMs.

Details of the eligibility criteria for membership on the F&O segment are provided in Tables 2.2. The TM—CM and the PCM are required to bring in additional security deposit in respect of every TM whose trades they undertake to clear and settle. Besides this, trading members are required to have qualified users and sales persons, who have passed a certification programme approved by SEBI.

Table 2.2: Business Growth of Futures and Options Market Turnover (₹ crore)

Month	Index futures	Index options	Stock options	Stock futures
Jun-00	35	–	–	–
Jun-01	590	195	–	–
Jun-02	2,123	389	4,642	16,178
Jun-03	9,348	1,942	15,042	46,505
Jun-04	64,017	8,473	7,424	78,392
Jun-05	77,218	14,799	14,799	163,096

2.2.4 Rules of Derivative Trading

The futures and options trading system of NSE, called NEAT-F&O trading system, provides a fully automated screen-based trading for Nifty futures & options and stock futures & options on a nationwide basis and an online monitoring and surveillance mechanism. It supports an anonymous order driven market which provides complete transparency of trading operations and operates on strict price—time priority. It is similar to that of trading of equities in the Cash Market (CM) segment. The NEAT-F&O trading system is accessed by two types of users. The Trading Members (TM) have access to functions such as order entry, order matching, order and trade management. It provides tremendous flexibility to users in terms of kinds of orders that

Notes

can be placed on the system. Various conditions like immediate or Cancel, Limit/Market price, Stop loss, etc. can be built into an order. The Clearing Members (CM) uses the trader workstation for the purpose of monitoring the trading member(s) for whom they clear the trades. Additionally, they can enter and set limits to positions, which a trading member can take.

Did u know? Exchanges in Asia grew especially rapidly in 2010, with growth rates of 42.8 percent, accounting for 39.8 percent of the global volume, compared to 32.2 percent for North America and 19.8 percent for Europe. Most of the increase in volume came from exchanges in China, India, and Korea. In India, the growth story was driven mainly by financial contracts, foreign exchange contracts in particular. In 2010, the dollar-rupee contract traded on the MCX-SX had a volume of 821.3 million contracts, making it the second most actively traded contract across all derivatives exchanges in the world. One of the most interesting stories in the Asia-Pacific region is the growth of equity index futures and options. These products are traded all across the regions, with some being relatively new to the market and others being very well-established.

Self Assessment

State whether the following statements are true or false:

4. NSE was the, first stock exchange in the country to provide nation-wide order-driven, screen-based trading system.
5. National Exchange for Automated Trading (NEAT) system is an anonymous order-driven system and operates on a strict volume/time priority.
6. The Trading Members (TM) have access to functions such as order entry, order matching, order and trade management.

2.3 BSE – Start of Derivative Trading

BSE created history on June 9, 2000 by launching the first Exchange-traded Index Derivative Contract i.e. futures on the capital market benchmark index - the BSE Sensex. The inauguration of trading was done by Prof. J.R. Varma, member of SEBI and Chairman of the committee which formulated the risk containment measures for the derivatives market. The first historical trade of 5 contracts of June series was done that day between the Members Kaji & Maulik Securities Pvt. Ltd. and Emkay Share & Stock Brokers Ltd. at the rate of 4755.

In sequence of product innovation, BSE commenced trading in Index Options on Sensex on June 1, 2001, Stock Options were introduced on 31 stocks on July 9, 2001 and Single Stock Futures were launched on November 9, 2002.

September 13, 2004 marked another milestone in the history of the Indian capital market, when BSE launched Weekly Options, a unique product unparalleled worldwide in the derivatives markets. BSE permitted trading in weekly contracts in options in the shares of four leading companies namely Reliance Industries, Satyam, State Bank of India, and TISCO (now Tata Steel) in addition to the flagship index-Sensex.

Chhota SENSEX was launched on January 1, 2008. With a small or 'mini' market lot of 5, it allows for comparatively lower capital outlay, lower trading costs, more precise hedging and flexible trading. It is a step to encourage and enable small investors to mitigate risk and enable easy access to India's most popular index, SENSEX, through futures & options. The Security Symbol for SENSEX Mini Contracts is MSX. The contract is available for one, two and three months along with weekly options.

Notes

2.3.1 Functioning of Derivative at BSE

The Derivatives Trading at BSE takes place through a fully automated screen-based trading platform called Derivatives Trading and Settlement System (DTSS).The DTSS is designed to allow trading on a real-time basis. In addition to generating trades by matching opposite orders, the DTSS also generates various reports for the member participants.

Order Matching Rules

Order Matching takes place after order acceptance wherein the system searches for an opposite matching order. If a match is found, a trade is generated. The order against which the trade has been generated is removed from the system. In case the order is not exhausted further matching orders are searched for and trades generated till the order gets exhausted or no more match-able orders are found. If the order is not entirely exhausted, the system retains the order in the pending order book. Matching of the orders is in the priority of price and timestamp. A unique trade-id is generated for each trade and the entire information of the trade is sent to the relevant Members.

Order Conditions

The derivatives market is order driven i.e. the traders can place only orders in the system. Following are the order types allowed for the derivative products. These order types have characteristics similar to the ones in the cash market.

- ***Limit Order:*** An order for buying or selling at a limit price or better, if possible. Any unexecuted portion of the order remains as a pending order till it is matched or its duration expires.
- ***Market Order:*** An order for buying or selling at the best price prevailing in the market at the time of submission of the order.

  There are two types of Market Orders:

  - *Partial Fill Rest Kill (PF):* This execute the available quantity and kill any unexecuted portion.
  - *Partial Fill Rest Convert (PC):* This execute the available quantity and convert any unexecuted portion into a limit order at the traded price.
- ***Stop Loss:*** An order that becomes a limit order only when the market trades at a specified price.

All orders have the following attributes:

- Order Type (Limit/Market PF/Market PC/Stop Loss)
- Asset Code, Product Type, Maturity, Call/Put and Strike Price
- Buy/Sell Indicator
- Order Quantity
- Price
- Client Type (Proprietary/Institutional/Normal)
- Client Code

Notes

- Order Retention Type (GFD/GTD/GTC):
  - *Good For Day (GFD):* The lifetime of the order is that trading session.
  - *Good Till Date (GTD):* The life of the order is till the number of days as specified by the Order Retention Period.
  - *Good Till Cancelled (GTC):* The order if not traded will remain in the system till it is cancelled or the series expires, whichever is earlier.
- ***Order Retention Period (in calendar days):*** This field is enabled only if the value of the previous attribute is GTD. It specifies the number of days the order is to be retained.
- ***Protection Points:*** This is a field relevant in Market Orders and Stop Loss orders. The value enterable will be in absolute underlying points and specifies the band from the touchline price or the trigger price within which the market order or the stop loss order respectively can be traded.
- ***Risk Reducing Orders (Y/N):*** When a Member's collateral falls below 50 lacs, he will be allowed to put only risk reducing orders and will not be allowed to take any fresh positions. It is not essentially a type of order but a mode into which the Member is put into when he violates his collateral limit.

Caution A Member who has entered the risk-reducing mode will be allowed to put only one risk reducing order at a time.

2.3.2 Comparison between NSE and BSE

There are two camps of thought with regard to preference of either the BSE or NSE:

1. One which had brokers highly recommending the NSE and
2. The other which had brokers taking a neutral stance.

Essentially, those brokers who have started business over the past few years tend to enthusiastically praise the NSE for its transparency, decent risk controls and simple settlement mechanism. They also claim that since the NSE is never and not bound by traditions or vested interests, it has brighter prospects for the future, especially with regard to quicker and further technological advancements.

Self Assessment

Fill in the blanks:

7. The Security Symbol for SENSEX Mini Contracts is…….
8. The DTSS is designed to allow trading on a ……..basis.
9. …….is an order that becomes a limit order only when the market trades at a specified price.

2.4 NIFTY

The S & P CNX Nifty is a market capitalisation index based upon solid economic research. It was designed not only as a barometer of market movement but also to be a foundation of the new

Notes

world like index futures, index options and index funds. A trillion calculations were expended to evolve the rules inside the S&P CNX Nifty index. The results of this work are remarkably simple:

(a) The correct size to use is 50,

(b) Stocks considered for the S&P CNX Nifty must be liquid by the 'impact cost' criterion,

(c) The largest 50 stocks that meet the criterion go into the index.

S & P CNX Nifty is a contrast to the adhoc methods that have gone into index construction in the preceding years, where indexes were made out of intuition and lacked a scientific basis. The research that led up to S& P CNX Nifty is well respected internationally as a pioneering effort in better understanding how to make a stock market index.

The Nifty is uniquely equipped as an index for the index derivatives market owing to its:

(a) Low market impact cost; and

(b) High hedging effectiveness.

The good diversification of Nifty generates low initial thus making it easier to do arbitrage for index derivatives.

2.5 SENSEX

The Stock Exchange, Mumbai created history by launching the first exchange traded financial derivatives product in India, the Sensex Futures.

2.5.1 Sensex Index

An Index is an indicator of the broad market. For instance, tracking the changes in the Sensex enables one to effectively gauge market movements. The BSE Sensex, first compiled in 1986, is a market capitalisation weighted index of 30 scripts. It represents 30 large well-established and financially sound companies. The Sensex also has the largest social recall attached with it. It was the first index to be launched by any Exchange in India and has acquired a unique place in the collective memory of investors. It facilitates investors to relate to the market.

The most important advantage is that, as one of the oldest and reliable barometers of the Indian Stock Market, it provides time series data over a fairly long period of time. The primary consideration in, minimising changes in the composition of the BSE 30 has been for historical purposes. However, the structural and market driven changes are taken into consideration.

Caution While an index must represent the current state of an evolving market, it should concurrently maintain the track record of changes in the Indian capital markets.

The Sensex represents a broad spectrum of companies in a variety of industries. It represents 14 major industry groups, which are large enough to be used for effective hedging.

2.5.2 Trading in Sensex Futures

Given the lower cost structure and the overwhelming popularity of the Sensex, Sensex futures are expected gamer large volumes. The Sensex futures are expected to become the most liquid contract in the country. This is because institutional investors in India and abroad, money managers and small investors use the Sensex when it comes to describing the mood of the Indian

Notes

Stock Markets. Thus is has been observed that the Sensex is an effective proxy for the Indian stock markets. Higher liquidity in the product essentially translates to lower impact cost of trading in Sensex futures. The arbitrage between the futures and the equity market is further expected to reduce impact cost. Immense retail participation to the extent of 80-90 percent is expected in India based on following factors:

1. Stock index futures will require lower capital adequacy and margin requirements as compared to margins carry forward of individual scrips.
2. The brokerage costs on index futures will be much lower.
3. Savings in cost is possible through reduced bid-ask spreads where stocks are traded in packaged forms.
4. The impact cost will be much lower in case of stock index futures as opposed to dealing in individual scrips.

The market is conditioned to think in terms of the index and therefore, would prefer to trade in stock index futures. Further, the chances of manipulation are much lesser.

The stock index futures are expected to be extremely liquid given the speculative nature of our markets the overwhelming retail participation expected to be fairly high. It is poised to become the most liquid contract in the world in terms of number of contracts traded, if not in terms of notional value. The advantage to the equity or cash market is in the fact that they would become less volatile as most of the speculative activity would shift to stock index futures. The stock index futures market should ideally have more depth, volumes, and act as a stabilising factor for the cash market. However, it is too early to base any conclusions on the volume or to form any firm trend.

Self Assessment

Fill in the blanks:

10. …… was designed not only as a barometer of market movement but also to be a foundation of the new world like index futures, index options and index funds.
11. An …… is an indicator of the broad market.
12. The ……. are expected to become the most liquid contract in the country.

Task Like our stock markets, the Indian derivatives markets are also becoming heavily dependent on a few instruments. For instance, futures in three blue-chip companies such as Satyam Computers, Reliance Industries and Infosys Technologies, have accounted for as much as 42% of the total turnover in the derivatives segment of the National Stock Exchange in June, 2002. Stock futures of Satyam Computers, Infosys Technologies and HPCL accounted for 37% of the total turnover in May 2002, 35% in April 2002 and 34% in March 2002. Comment.

2.6 Application of Index

Besides serving as a barometer of the economy/market, the index also has other applications in finance.

Notes

2.6.1 Index Derivatives

Index derivatives are derivative contracts which have the index as the underlying. The most popular index derivatives contract the world over is index futures and index options. NSE's market index, the S&P CNX Nifty was scientifically designed to enable the launch of index—based products like index derivatives and index funds.

Did u know? The first derivative contract to be traded on NSE's market was the index futures contract with the Nifty as the underlying. This was followed by Nifty options and thereafter by sectoral indexes, CNX IT and BANK Nifty contracts.

2.6.2 Index Funds

An index fund is a fund that tries to replicate the index returns. It does so by investing in index stocks in the proportions in which these stocks exist in the index. The goal of the index fund is to achieve the same performance as the index it tracks.

Example: A Nifty index fund would seek to get the same return as the Nifty index. Since the Nifty has 50 stocks, the fund would buy all 50 stocks in the proportion in which they exist in the Nifty. Once invested, the fund will track the index, i.e. if the Nifty goes up; the value of the fund will go up to the same extent as the Nifty. If the Nifty falls, the value of the index fund will fall to the same extent as the Nifty.

The most useful kind of market index is one where the weight attached to a stock is proportional to its market capitalisation, as in the case of Nifty. Index funds are easy to construct for this kind of index since the index fund does not need to trade in response to price fluctuations. Trading is only required in response to issuance of shares, mergers, etc.

Caselet

Use of Futures Market by Index Funds

Futures market can be used for creating sympathetic index funds. Synthetic index funds created using futures contracts have advantage of simplicity and low costs. The simplicity stems from the fact that index futures automatically track the index. The cost advantages stem from the fact that the costs of establishing and re-balancing the fund are substantially reduced because commissions and bid-ask spread's are lower in the futures markets than in the equity markets.

The methodology for creating a synthetic index fund is to combine index futures contracts with bank deposits be treasury bills. The index fund uses part its money as margin on the futures market and the rest is invested at the risk-free rate of return. This methodology however does require frequent roll-over as futures contracts expire.

Index funds can also use the futures market for the purpose of spreading index sales or purchases over a period of time. Take the case of an index fund which has risen ₹ 100 crore from the market. To reduce the tracking error, this money must be invested in the index immediately. However large trades large impact costs. What they found can do is, the moment it receives the subscriptions it can buy index futures. Then gradually over a period of say a month, it can keep acquiring the underlying index stocks, it should unwind its position on the futures market by selling futures to the extent of stock period acquired. This should continue till the fund is fully invested in the index.

Source: Derivative Products and Valuation, by Subba Rao.

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2.6.3 Exchange Traded Funds

Exchange Traded Funds (ETFs) are innovative products, which first came into existence in the USA in 1993. They have gained prominence over the last few years with over $300 billion invested as of end 2001 in about 360 ETFs globally.

Did u know? About 60% of trading volume on the American Stock Exchange is from ETFs. Among the popular ones are SPDRs (Spiders) based on the S&P 500 Index, QQQs (Cubes) based on the Nasdaq-l00 Index, iSHARES based on MSCI Indices and TRAHK(Tracks) based on the Hang Seng Index.

ETFs provide exposure to an index or a basket of securities that trade on the exchange like a single stock. They have a number of advantages over traditional open-ended funds as they can be bought and sold on the exchange at prices that are usually close to the actual intra-day NAV of the scheme. They are an innovation to traditional mutual funds as they provide investors a fund that closely tracks the performance of an index with the ability to buy/sell on an intra-day basis. Unlike listed closed-ended funds, which trade at substantial premia or frequently at discounts to NAV, ETFs are structured in a manner which allows creating new units and redeeming outstanding units directly with the fund, thereby ensuring that ETFs trade close to their actual NAVs.

The first ETF in India, "Nifty BEES" (Nifty Benchmark Exchange Traded Scheme) based on S&P CNX Nifty, was launched in December 2001 by Benchmark Mutual Fund. It is bought and sold like any other stock on NSE and has all characteristics of an index fund. It would provide returns that closely correspond to the total return of stocks included in Nifty.

Self Assessment

State whether the following statements are true or false:

13. Index derivatives are derivative contracts which have the index as the underlying.
14. An index fund is a fund that tries to replicate the index returns.
15. The first ETF in India, "Nifty BEES" (Nifty Benchmark Exchange Traded Scheme) based on S&P CNX Nifty, was launched in December 2001 by SEBI.

Case Study

Foreign Exchange

The Foreign Exchange Market is all set to welcome the FX portals that are sure to revolutionise the way Forex trading would take place in future. Their viability would depend on the way participants would embrace them and on the competition that would ensue. The two portals that have hit the market amid great fanfare are FX all and Atriax. By providing a sufficient range of currencies to the players to allow ease of execution and by giving access to a range of prices from different sources at all times, these portals are aiming to garner liquidity. Instead of being in a win-lose situation, a win-win scenario could emerge if both the systems would work in tandem and manage to capture a large enough portion of the growing Foreign Exchange Market pie. Forex trading itself is expected to zoom because of growing B2B transactions over internet as the investors are going global and holding greater foreign securities in their portfolios. Therefore, a more

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price sensitive and web-enabled Foreign Exchange Market would emerge, which in turn would result in transactions that are complex to liquidate and time consuming to settle. For the automated marketplace where information need looms large, lies the answer in the form of such portals.

The success of these platforms would depend on a host of factors such as their automatic execution, the method of providing prices to the users, the number of partnership agreements that the portal has the number of banks it caters to, etc. The other important feature will be their pricing engines. The quality of the pricing engine, its ability to handle huge volume of transactions and the quality of transaction services, such as ease of settlement, pre-trade information etc. will all determine their fate.

However, from the user's point, the problem that emerges is would the cost of settling with multiple counter parties (as opposed to just using one or two lead banks for FX trading) come in the way of using a multiple price service? But the customers have been working on integration with a single bank for long, these FX platforms should be attractive, as they will only have to make one investment to access multitude of dealers.

However, for such electronic trading to gather momentum, users need to shift from telephone-based to screen-based trading which would be a tough task. Then they are to be persuaded to move to a single-dealer channel from the multi-dealer channel, which would not be very difficult once the initial step is taken.

When the traditional and clerical jobs are automated by these electronic exchanges, sales desk officers/client relationship managers would be left with more time to spend on value added activities–delivering advice and information. Hence, these platforms could go a long way in lowering cost and improving service quality.

Question:

Do you think that a web-enabled Foreign Exchange Market would revolutionise the forex trading practices in the future? Elucidate with examples.

Source: Madhu Vij. "International Financial Management". Excel Books (2010).

2.7 Summary

- Derivatives markets in India can be broadly categorised into two markets namely; financial derivatives markets and commodities futures markets.
- The SEBI is authorised under the SEBI Act to frame rules and regulations for financial futures trading on the stock exchanges with the objective to protect the interest of the investors in the market.
- NSE was the, first stock exchange in the country to provide nation-wide order-driven, screen-based trading system.
- The futures and options trading system of NSE, called NEAT-F&O trading system, provides a fully automated screen-based trading for Nifty futures & options and stock futures & options on a nationwide basis and an online monitoring and surveillance mechanism.
- The Derivatives Trading at BSE takes place through a fully automated screen-based trading platform called DTSS (Derivatives Trading and Settlement System).
- The S & P CNX Nifty is a market capitalisation index based upon solid economic research. It was designed not only as a barometer of market movement but also to be a foundation of the new world like index futures, index options and index funds.

Notes

- The Stock Exchange, Mumbai created history by launching the first exchange traded financial derivatives product in India, the Sensex Futures.
- Index derivatives are derivative contracts which have the index as the underlying. The most popular index derivatives contract the world over is index futures and index options.
- Exchange Traded Funds (ETFs) are innovative products, which first came into existence in the USA in 1993. They have gained prominence over the last few years with over $300 billion invested as of end 2001 in about 360 ETFs globally.

2.8 Keywords

Chhota SENSEX: With a small or 'mini' market lot of 5, it allows for comparatively lower capital outlay, lower trading costs, more precise hedging and flexible trading.

Derivatives trading and Settlement System: The Derivatives Trading at BSE takes place through a fully automated screen-based trading platform called Derivatives Trading and Settlement System (DTSS).

Index Derivatives: Index derivatives are derivative contracts which have the index as the underlying.

Index Funds: An index fund is a fund that tries to replicate the index returns.

Limit Order: An order for buying or selling at a limit price or better, if possible.

Market Order: An order for buying or selling at the best price prevailing in the market at the time of submission of the order.

National Exchange for Automated Trading (NEAT): National Exchange for Automated Trading (NEAT) system is an anonymous order-driven system and operates on a strict price/time priority.

NIFTY: It was designed not only as a barometer of market movement but also to be a foundation of the new world like index futures, index options and index funds.

Sensex Index: An Index is an indicator of the broad market.

Stop Loss: An order that becomes a limit order only when the market trades at a specified price.

2.9 Review Questions

1. Explain the derivatives market in India. Also discuss the important eligibility/regulatory conditions specified by SEBI.
2. Explain the functioning of derivatives trading in BSE and NSE.
3. What are the rules of derivative trading?
4. Explain the functioning of derivatives trading in NIFTY and SENSEX. Also discuss the NEAT Trading System.
5. Provide a comparison between NSE and BSE.
6. What are the major stock indices in India? Discuss in detail about the Sensex and S& P CNX Nifty Indices?
7. "Besides serving as a barometer of the economy/market, the index also has other applications in finance." Elaborate the application of index.
8. Write down the meaning of Sensex Index.

Notes

9. Explain the meaning of Index funds.
10. What are Exchange Traded Funds?

Answers: Self Assessment

1. Securities and Exchange Board of India (SEBI)

2.	Forwards	3.	Forward Market Commission (FMC)
4.	True	5.	False
6.	True	7.	MSX
8.	Real-time	9.	Stop loss
10.	S & P CNX Nifty	11.	Index
12.	Sensex futures	13.	True
14.	True	15.	False

2.10 Further Readings

Books

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Notes

Unit 3: Introduction to Forward Contracts

CONTENTS

Objectives

Introduction

3.1 Forward Contracts

3.1.1 Definitions

3.1.2 Features of a Forward Contract

3.1.3 Classification of Forward Contracts

3.1.4 Forward Contract Mechanism

3.2 Forward Terminologies

3.3 Benefits and Limitations of Forward Markets

3.4 Summary

3.5 Keywords

3.6 Review Questions

3.7 Further Readings

Objectives

After studying this unit, you should be able to:

- State the definition and concept of forward contracts;
- Describe the terminologies used in forward contracts;
- Discuss the salient features of forward contracts;
- Discuss the classification of Forward Contracts;
- Explain the benefits and limitations of Forward Markets.

Introduction

In the previous unit, we studied about the derivatives market in India i.e. derivatives market at NSE, BSE, NIFTY and SENSEX. We also discussed about the important eligibility/regulatory conditions specified by SEBI, comparison between NSE and BSE, Index derivatives and Exchange Traded Funds in the last unit. This unit will helps you to understand the concept of forward contracts and the terminologies used in it. We will also learn the various features, classification, benefits and limitations of forward contracts in the various sections and sub section of this unit. To make the learning easier, we will take the help of globally recognised best practices.

A Forward Contract is a contract made today for delivery of an asset at a pre-specified time in the future at a price agreed upon today. The buyer of a forward contract agrees to take delivery of an underlying asset at a future time (T), at a price agreed upon today. No money changes hands until time T. The seller agrees to deliver the underlying asset at a future time T, at a price agreed upon today. Again, no money changes hands until time T. A forward contract, therefore, simply amounts to setting a price today for a trade that will occur in the future. In other words, a forward contract is a contract between two parties who agree to buy/sell a specified quantity of a financial instrument/commodity at a certain price at a certain date in future.

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3.1 Forward Contracts

A forward contract is a simple customised contract between two parties to buy or sell an asset at a certain time in the future for a certain price. Unlike future contracts, they are not traded on an exchange, rather traded in the over-the-counter market, usually between two financial institutions or between a financial institution and one of its clients.

Example: An Indian company buys Automobile parts from USA with payment of one million dollar due in 90 days. The importer, thus, is short of dollar that is; it owes dollars for future delivery. Suppose present price of dollar is ₹ 48. Over the next 90 days, however, dollar might rise against ₹ 48. The importer can hedge this exchange risk by negotiating a 90 days forward contract with a bank at a price ₹ 50. According to forward contract in 90 days the bank will give importer one million dollar and importer will give the bank 50 million rupees hedging a future payment with forward contract. On the due date importer will make a payment of ₹ 50 million to bank and the bank will pay one million dollar to importer, whatever rate of the dollar is after 90 days. So this is a typical example of forward contract on currency.

A forward contract is an agreement between two parties to buy or sell underlying assets at a pre-determined future date at a price agreed when the contract is entered into. Forward contracts are not standardised products. They are over-the-counter (not traded in recognised stock exchanges) derivatives that are tailored to meet specific user needs. The underlying assets of this contract include:

1. Traditional agricultural or physical commodities
2. Currencies (foreign exchange forwards)
3. Interest rates (forward rate agreements or FRAs)

Example: Suppose you decide to subscribe to cable TV. As the buyer, you enter into an agreement with the cable company to receive a specific number of cable channels at a certain price every month for the next year. This contract made with the cable company is similar to a futures contract, in that you have agreed to receive a product at a future date, with the price and terms for delivery already set. You have secured your price for now and the next year-even if the price of cable rises during that time. By entering into this agreement with the cable company, you have reduced your risk of higher prices.

At the time the forward contract is written, a specified price is fixed at which the asset is purchased or sold. This delivery price is referred to as the delivery price. This delivery price is set such that the either a long (buyer) or a short (seller) position. This is done by convention so that no cash is exchanged between the parties entering into the contracts. In this way, the delivery price yields a 'fair' price for the future delivery of the underlying asset. One of the parties to a forward contract agrees to buy the underlying asset is aid to have a 'long' position. On the other hand, the party that agrees to sell the same underlying asset is said to have a 'short' position.

3.1.1 Definitions

A forward contract is an agreement between two parties to buyer sells, as the case may be, a commodity (or financial instrument or currency) at a predetermined future date at a price agreed when the contract is entered into.

The key elements are:

1. The date on which the commodity will be bought/sold is determined in advance.
2. The price to be paid/received at that future date is determined at present.

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Example: In the month of August, a rice mill agrees to buy one tonne of paddy from a farmer in the following February at a price of ₹ 3000. This is a forward contract. Note that the farmer will receive ₹ 3000 in February irrespective of whether the market price in February is ₹ 2000 or ₹ 4000.

Legal definitions of forward contracts

Under the Forward Contracts (Regulation) Act, 1952 forward contracts are classified into:

- ***Hedge contracts:*** These are freely transferable and do not specify any particular lot, consignment or variety for delivery. Delivery in such contracts (which may be of any of the approved deliverable varieties) is unnecessary except in a residual or optional sense, Hedge contracts are subject to the regulatory provisions of the forward Contracts (Regulation) Act.
- ***Transferable Specific Delivery (TSD) contracts:*** These are contracts, which, though freely transferable from one party to another, are concerned with a specific and predetermined consignment or variety of the commodity. Delivery, of the agreed variety, is mandatory. Such contracts are normally subject to the regulatory provisions of the Act but may be exempted from regulation (in specified cases) by the Central Government.
- ***Non-transferable Specific Delivery (NTSD) contracts:*** These are concerned with a specific variety or consignment and are not transferable at all. Contract terms are highly specific. Delivery is mandatory. NTSD contract are normally exempt from the regulatory provisions of the Act, but may be brought under regulation by the Central Government, wherever felt necessary (in practice, NTSD contracts in most items have been brought under regulation).

As will be obvious, the legal definition of hedge contracts corresponds to the analytical definition of futures contracts, while the latter two categories are not 'futures' contracts or hedge contracts does not specify precisely which variety or consignment will actually be delivered because the limits are set by the rules of the exchange on which types can or cannot be delivered. Where a variety superior or inferior to the basis variety is tendered for delivery, prices are adjusted by means of premia or discounts, as they may be, these are commonly known as tendering differences.

Caution Every futures contract is a forward contract, not every forward contract is a future contract.

3.1.2 Features of a Forward Contract

The salient features of forward contracts are:

1. Forward contracts are bilateral contracts, and hence, they are exposed to counter party risk. There is risk of non-performance of obligation either of the parties, so these are riskier than to futures contracts.

   Example: Trade takes place between party A and party B for X kgs. of a commodity. The pre-specified delivery price is ₹ 100 per kg., and the maturity is 1 month. After 1 month, the commodity is trading at ₹ 120 per kg. If A was the buyer, he would gain ₹ 20 and B suffer have a loss of ₹ 20. In case B defaults (refuses to sell at ₹ 100 per kg. as

promised), party A is exposed to counter-party risk i.e. risk of foregoing the deserving gain of ₹ 20 per kg. In case of future contracts, the stock/commodity exchange (through a clearing house) gives a guarantee even if the counter party defaults. This is done through a system of daily margins.

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

3. In forward contract, one of the parties takes a long position by agreeing to buy the asset at a certain specified future date. The other party assumes a short position by agreeing to sell the same asset at the same date for the same specified price. A party with no obligation offsetting the forward contract is said to have an open position.

Notes A party with a closed position is, sometimes, called a hedger.

4. The specified price in a forward contract is referred to as the delivery price. The forward price for a particular forward contract at a particular time is the delivery price that would apply if the contract were entered into at that time. It is important to differentiate between the forward price and the delivery price. Both are equal at the time the contract is entered into.

Caution As time passes, the forward price is likely to change whereas the delivery price remains the same.

5. In the forward contract, derivative assets can often be contracted from the combination of underlying assets, such assets are generally known as synthetic assets in the forward market.

6. In the forward market, the contract has to be settled by delivery of the asset on expiration date. In case the party wishes to reverse the contract, it has to compulsory go to the same counter party, which may dominate and command the price it wants as being in a monopoly situation.

7. In the forward contract, covered parity or cost-of-carry relations are relation between the prices of forward and underlying assets. Such relations further assist in determining the arbitrage-based forward asset prices.

8. Forward contracts are very popular in foreign exchange market as well as interest rate bearing instruments. Most of the large and international banks quoted the forward rate through their 'forward desk' lying within their foreign exchange trading room. Forward foreign exchange quotes by these banks are displayed with the spot rates.

9. As per the Indian Forward Contract Act 1952, different kinds of forward contracts can be done like hedge contracts, transferable specific delivery (TSD) contracts and non-transferable specify delivery (NTSD) contracts. Hedge contracts are freely transferable and do not specific, any particular lot, consignment or variety for delivery. Transferable specific delivery contracts are though freely transferable from one party to another, but are concerned with a specific and predetermined consignment. Delivery is mandatory. Non-transferable specific delivery contracts, as the name indicates, are not transferable at all, and as such, they are highly specific.

In brief, a forward contract is an agreement between the counter parties to buy or sell a specified quantity of an asset at a specified price, with delivery at a specified time (future) and place.

Notes

Caution These contracts are not standardised; each one is usually being customised to its owner's specifications.

Did u know? In essence, a forward transaction typically involves a contract, most often with a bank, under which both the buyer and holder of the contract and the seller (or writer) of the contract are obligated to execute a transaction at a specified price on a pre-specified date. This means that the seller is 'obligated' to deliver a specified asset to the buyer on a specified date in the future, and the buyer is 'obligated' to pay the seller a specified price upon delivery. This specified price is known as the 'forward price'.

At the inception of the contract, the contract value is zero in the eyes of both the buyer and the seller. But the value of the underlying asset changes throughout the life of the contract, and as such there is a change in the value of the contract vis-à-vis the buyer and the seller. The value changes for the benefit of one party and at the expense of the other. This property of the forward contract makes it a "zero-sum-game" for the buyer and seller.

This zero-sum characteristic can be better understood through an example.

Example: Consider a forward contract written on a specified asset with a forward exercise price for the asset of ₹ 50. If there is a sudden upswing in the asset's price to ₹ 55, how will it affect both parties' views of the value of the contract? The seller of the forward contract views the contract to have lost value because the price at which he is obligated to sell the asset (₹ 50) is lesser than that which could be received in the spot market (₹ 55). On the other hand; the buyer of the contract views the contact as having gained value. As the spot price of the asset increases, there is a better chance that the forward exercise price will be below the prevailing spot market price in the future when the forward contract matures and the asset is delivered. If this market condition prevails until the specified delivery date, the seller's loss equals the buyer's gain.

3.1.3 Classification of Forward Contracts

Forward contracts in India are broadly governed by the Forward Contracts (Regulation) Act, 1952. According to this Act, forward contracts are of the following three major categories.

1. ***Hedge Contracts:*** These are freely transferable contracts which do not require specification of a particular lot size, quality or delivery standards for the underlying assets. Most of these are necessary to be settled through delivery of underlying assets.
2. ***Transferable Specific Delivery Forward Contracts:*** Apart from being freely transferable between parties concerned, these forward contracts refer to a specific and predetermined lot size and variety of the underlying asset. It is compulsory for delivery of the underlying assets to take place at expiration of contract.
3. ***Non-transferable Specific Delivery Forward Contracts:*** These contracts are normally exempted from the provision of regulation under Forward Contract Act, 1952 but the Central Government reserves the right to bring them back under the Act when it feels necessary. These are contracts which cannot be transferred to another party. The contracts, the consignment lot size, and quality of underlying asset are required to be settled at expiration through delivery of the assets.

Notes

Caselet

Mr. X (Short Position) Wishes to Offset his Position

Suppose Mr. X, the wholesale dealer of sugar wishes to get out of his initial short forward position (of delivering 50 kgs. sugar to Mr. Y at ₹ 25 per kg on 1st July, 2011) before the maturity. Let us say, on 1st May, 2011, Mr. X decided to get out of his position and hence enters into forward another contract with Mr. W in which he agrees to buy (offsetting position, since Mr. X initial position was to sell) from Mr. W 50 kgs. of sugar at ₹ 24 and this contract expires on 1st July, 2011.

Let us consider the Time Line of Mr. X

Procter & Gamble Co.

1st April, 2011	1st May, 2011	1st July, 2011
Enters into Short Forward with Mr.Y (expiry on 1st July, 2011	Enters another Long Forward with Mr.W (expiry on 1st July, 2011	Long Forward and Short Forward Expires

Profit/Loss position of Mr. X (on 1st July, 2011) after offsetting his initial forward position is as follows:

Buying 50 kgs. at ₹ 24 to Mr. W, and cash outflow (payment)	- ₹ 1,200
Selling 50 kgs. at ₹ 25 to Mr. Y, and cash inflow (receive)	+ ₹ 1,250
Total Gain	+ ₹ 50

A strong reason for Mr. X to offset his position could be that he is in short supply of sugar and in order to fulfil his short position of delivering 50 kgs. to Mr. Y, he enters into a long forward (promise to buy) with Mr. W.

Source: Bishnupriya M., Sathya S. D. "Financial Derivatives". Excel Books (2007).

3.1.4 Forward Contract Mechanism

A forward contract is an effective hedging mechanism similar to an insurance policy, as it protects a trader from unfavourable exchange rate movements. The trading mechanism of forward contracts can be better understood through the following example.

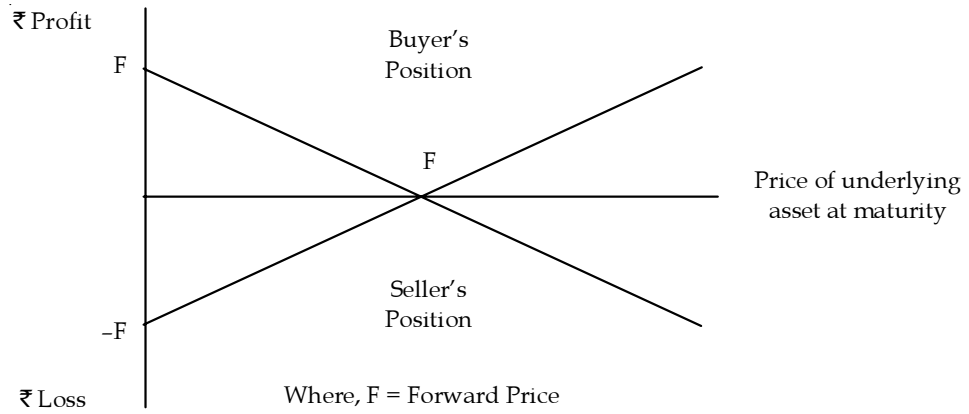
Example: Suppose Mr. X is a wholesale sugar dealer and Mr. Y is the prospective buyer. The current price (on 1st April, 2011) of sugar per kg. is ₹ 23. Mr. Y agrees to buy 50 kgs. of sugar at ₹ 25 per kg after three months (1st July, 2011).

The price is arrived at on the basis of prevailing market conditions and future perceptions about the price of sugar. If on 1st July, 2011). The market price of sugar is ₹ 30 per kg, then Mr. Y is a gainer by ₹ 5 per kg and if the price of sugar is ₹ 20 per kg, then Mr. X is a gainer by ₹ 5 per kg. One party's gain is another part's loss by the same amount.

Notes

The profit/loss payoff is symmetrical as shown in Figure 3.1.

Figure 3.1: Pay-Off of forward Contracts



Notes No party loses in this type of contract because by limiting the losses, its better control the business. Let us understand this from the perspective of both Mr. X and Mr. Y. Mr. X will gain even if the price of sugar is ₹ 20 a kg because at the time of entering the contract with Mr. Y, Mr. X did not know what exactly the price of sugar would be after three months (i.e., on 1st July, 2011). So, by agreeing to sell sugar at ₹ 25 a kg, Mr. X are assured of a certain earning based on which he can now plan the financial needs of his business. Similarly, Mr. Y also knows that he will have to sell out a fixed amount, based on which he too can take care of the financial needs of his business. It will help Mr. Y to control his cost.

Did u know? How does the mark to market mechanism work?

Mark to market is a mechanism devised by the stock exchange to minimise risk. In case you start making losses in your position, exchange collects money to the extent of the losses up front. For example, if you buy futures at ₹ 300 and its price falls to ₹ 295 then you have to pay a mark to market margin of ₹ 5. This is over and above the margin money that you pay to take a position in the future.

Self Assessment

Fill in the blanks:

1. A ……..... contract is an agreement between two parties to buy or sell underlying assets at a pre-determined future date at a price agreed when the contract is entered into.
2. Forward contracts are not ……..... products.
3. Forward contracts are bilateral negotiated contract between two parties and hence exposed to …….....

3.2 Forward Terminologies

Notes

The important terminologies used in forward contracts are described below:

1. ***Underlying Asset:*** This refers to the asset on which forward contract is made i.e., the long position holder buys this asset in future and the short position holder sells this asset in future. The various underlying assets are equity shares, stock indices, commodity, currency, interest rate, etc. For example, in the above case, sugar (a commodity) is the underlying asset.

2. ***Long Position:*** The party that agrees to buy an underlying asset (e.g. stock, commodity, stock index, etc.) in a future date is said to have a long position. For example, in the above case, Mr. Y is said to hold a long position. The long position holder on the contract agrees to buy the underlying asset on the future date because they are betting the price will go up.

3. ***Short Position:*** The party that agrees to sell an underlying asset (e.g. stock, commodity, indices, etc.) in future date is said to have a short position.

   Example: In the above case, Mr. X is said to hold a short position. The short position on the contract agrees to sell the security on the future date because they are betting the price will go down.

4. ***Spot Position:*** This is the quoted price of the underlying asset for buying and selling at the spot time or immediate delivery.

   Example: In the above case, the spot price of sugar (underlying asset) is ₹ 23 per kg.

5. ***Future Spot Price:*** This is the spot price of the underlying asset on the date the forward contract expires and it depends on the market condition prevailing at the expiration date.

   Example: In the above case, we have considered two situations for futures spot price i.e., ₹ 30 and ₹ 20.

6. ***Expiration Date:*** This is the date on which the forward contract expires or also referred to as maturity date of the contract. For example, in the above case, the expiry date is 1st July, 2011.

7. ***Delivery Price:*** The pre-specified price of the underlying assets at which the forward contract is settled on expiration is said to be delivery price.

   Example: In the above case, the delivery price is ₹ 25 per kg. of sugar.

Self Assessment

Fill in the blanks:

4. According to ……. ..... the value changes for the benefit of one party and at the expense of the other.

5. Forward contracts can be worth less than ……. .....

Notes

3.3 Benefits and Limitations of Forward Markets

The following are some of the benefits of the forward markets:

1. Forward contracts can be used to hedge or lock-in the price of purchase or sale of commodity or financial asset on the future commitment date.
2. On forward contracts, generally, margins are not paid and there is also no upfront premium. So, it does not involve initial cost.
3. Since forwards are tailor-made, price risk exposure can be hedged up to 100%, which may not be possible in futures or options.

The following are some of the limitations of the forward markets worldwide:

1. Lack of centralisation of trading,
2. Illiquidity, and
3. Counterparty risk

In the first of these two, 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 standardised contracts, and hence avoid the problem of illiquidity, the counterparty risk still remains a very serious issue.

However, following are some other disadvantages of forward contracts:

1. Counterparty risk is very much present in a forward contract since there is no performance guarantee. On due date, the possibility of counterparty's failure to perform his obligation creates another risk exposure.
2. Forward contracts do not allow the investor to derive any gain from favourable price movement or to unwind the transactions once the contract is made. At the most, the contract can be cancelled on the terms agreed upon by the counterparty.
3. Since forwards are not exchange-traded, they have no ready liquidity. Further, it is difficult to get counterparty on one's terms.
4. One of the counterparties of these contracts is generally a bank or trader who square up their position by entering into reverse contract. These transactions do not take place simultaneously, so these parties normally keep large bid-ask spread to avoid any loss due to price fluctuations. This increases the cost of hedging.

Task Collect the data of forward agreements for 2012 and analyse the growth of forward contracts in India in comparison to other developing countries.

Self Assessment

State whether the following statements are true or false:

6. Counterparty risk arises from the possibility of default by both the party to the transaction.

Notes

7. The party that agrees to buy an underlying asset (e.g. stock, commodity, stock index, etc.) in a future date is said to have a short position.
8. Spot position is the quoted price of the underlying asset for buying and selling at the spot time or immediate delivery.
9. The pre-specified price of the underlying assets at which the forward contract is settled on expiration is said to be delivery price.
10. The party that agrees to sell an underlying asset (e.g. stock, commodity, indices, etc.) in future date is said to have a short position.

Case Study

Bruin Herbal Products – Forward Hedge

Bruin Herbal Products located in India is an old-line producer of herbal teas, seasoning and medicines. Their products are marketed all over India and in many parts of Europe as well.

Bruin Herbal generally invoices in rupees when it sells to foreign customers in order to guard against exchange rate changes. However, the company has received an order from a large wholesaler in France for ₹ 40,00,000 of its products. The condition is that the delivery should be made in 3 months time and the order invoiced in French francs.

The manager of Bruin herbal is concerned – what if the rupee appreciates versus the franc over the next three months thus eliminating most of the profit when the French franc receivable is paid. The manager decides to contact the firm's banker for suggestions about hedging the exchange rate exposure.

The banker informs the company that the current Spot exchange rate is 1FFr = ₹ 6.60, thus the invoice amount should be FFr 264,00,000. The 90 day forward rate for the rupee and the French franc versus the US dollar are 1FFr = ₹ 6.50 and 1$ = ₹ 42.0283. The banker offers to set up a forward hedge for selling the franc receivable for rupees based on the cross forward exchange rate implicit in the forward rate against the dollar.

Question:

What would be your decision if you were the manager of Bruin Herbal Products? Show the relevant calculations. Interest rate in India = 9%, Interest rate in France = 12%.

Source: Madhu Vij. "International Financial Management". Excel Books (2010).

3.4 Summary

- A Forward Contract is a contract made today for delivery of an asset at a pre-specified time in the future at a price agreed upon today.
- Unlike future contracts, they are not traded on an exchange, rather traded in the over-the-counter market, usually between two financial institutions or between a financial institution and one of its clients.
- They are over-the-counter (not traded in recognised stock exchanges) derivatives that are tailored to meet specific user needs.
- Forward contracts are bilateral contracts, and hence, they are exposed to counter party risk.

Notes

- Also, since the contracts are not exchange-traded, there is no marking to market requirement, which allows a buyer to avoid almost all capital outflows initially (though some counterparties might set collateral requirements).
- Given the lack of standardisation in these contracts, there is very little scope for a secondary market in forwards.
- The price specified in a forward contract for a specific commodity.
- The forward price makes the forward contract have no value when the contract is written.
- 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.

3.5 Keywords

Delivery Price: The pre-specified price of the underlying assets at which the forward contract is settled on expiration is said to be delivery price.

Economic exposure: Economic exposure refers to the impact of fluctuations in financial prices on the core business of the firm.

Forward Contract: A forward contract is one to one bi-partite contract, to be performed in the future, at the terms decided today. (E.g. forward currency market in India).

Future Spot Price: This is the spot price of the underlying asset on the date the forward contract expires and it depends on the market condition prevailing at the expiration date.

Long Position: The party that agrees to buy an underlying asset (e.g. stock, commodity, stock index, etc.) in a future date is said to have a long position.

Short Position: The party that agrees to sell an underlying asset (e.g. stock, commodity, indices, etc.) in future date is said to have a short position.

Transactional risks: Transactional risks reflect the pejorative impact of fluctuations in financial prices on the cash flows that come from purchases or sales.

Transferable Specific Delivery (TSD) contracts: These are contracts, which, though freely transferable from one party to another, are concerned with a specific and predetermined consignment or variety of the commodity.

Translation risks: Translation risks describe the changes in the value of a foreign asset due to changes in financial prices, such as the foreign exchange rate.

3.6 Review Questions

1. What do you mean by a Forward Contract? Explain using a suitable example.
2. Define the concept forward contract and explain its features.
3. "Forward contracts act as fore-runners of futures market". Critically evaluate the statement in the light of growth of forward market worldwide.
4. Write a detailed note on classification of forward contracts with examples.
5. Briefly discuss the trading mechanism of the forward market.

Notes

6. What are important terms used in trading forward contract? Explain.
7. List the major features of forward contracts.
8. Explain the main benefits and limitation of forward contracts.
9. Explain the statement: "Forwards are zero-sum games".
10. Explain the various uses of forward contract with suitable examples.

Answers: Self Assessment

1.	Forward	2.	Standardised
3.	Counter party risk	4.	Zero-sum-game
5.	Zero	6.	False
7.	False	8.	True
9.	True	10.	True

3.7 Further Readings

Books

Apte, P.G., *International Financial Management*, Tata McGraw-Hill Publishing

Baghri and Vora, *Options and Futures*, Tata McGraw Hill

Gupta S.L., *Financial Derivatives*, 2005, PHI

Patwari D. C and Anshul Bhargava, *Options and Futures*, Jaico Books.

Online links

www.managementstudyguide.com

www.nse.org

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http://www.nseindia.com/content/ncfm/ncfm_modules.htm

Notes

Unit 4: Introduction to Future Contracts

CONTENTS

Objectives

Introduction

4.1 Futures Contracts

4.1.1 Nature of Futures Contracts

4.1.2 Characteristics of Futures Contracts

4.1.3 Standardisation of Futures Contracts

4.1.4 Categories of Futures Contracts

4.2 Distinction between Futures and Forwards Contracts

4.3 Futures Terminology

4.4 Types of Future Contracts

4.4.1 Stock Index Futures

4.4.2 Commodity Futures

4.4.3 Currency Futures

4.5 Summary

4.6 Keywords

4.7 Review Questions

4.8 Further Readings

Objectives

After studying this unit, you should be able to:

- State the meaning and concept of futures contracts;
- Discuss the nature, characteristics, and standardisation of futures contracts;
- Identify the distinction between Futures and Forwards Contracts;
- Explain the futures terminology;
- Explain the types of Future Contracts.

Introduction

In the previous unit, we studied about the concept of forward contracts and the terminologies used in it. We also discussed about the various features, classification, benefits and limitations of forward contracts. This unit will help you to understand the concept of future contracts and the terminologies used in it. We will also identify the distinction between futures and forwards contracts.

A futures contract is a type of derivative instrument, or financial contract, in which two parties agree to transact a set of financial instruments or physical commodities for future delivery at a particular price. If you buy a future contract, you are basically agreeing to buy something that a seller has not yet produced for a set price. But participating in the futures market does not necessarily mean that you will be responsible for receiving or delivering large inventories of physical commodities remember, buyers and sellers in the futures market primarily enter into

futures contracts to hedge risk or speculate rather than to exchange physical goods (which is the primary activity of the cash/spot market). That is why futures are used as financial instruments by not only producers and consumers but also by speculators.

4.1 Futures Contracts

A future contract is a standardised agreement between the seller (short position) of the contract and the buyer (long position), traded on a futures exchange, to buy or sell a certain underlying instrument at a certain date in future, at a pre-set price. The future date is called the delivery date or final settlement date. The pre-set price is called the futures price.

Notes The price of the underlying asset on the delivery date is called the settlement price.

Thus, futures is a standard contract in which the seller is obligated to deliver a specified asset (security, commodity or foreign exchange) to the buyer on a specified date in future and the buyer is obligated to pay the seller the then prevailing futures price upon delivery. Pricing can be based on an open outcry system, or bids and offers can be matched electronically. The futures contract will state the price that will be paid and the date of delivery.

Did u know? Pricing can be based on an open outcry system, or bids and offers can be matched electronically. The futures contract will state the price that will be paid and the date of delivery.

Financial futures are not different from commodity futures except of the underlying asset, for example, in commodity futures, a particular commodity like food grains, metals, vegetables, etc. are traded whereas in financial futures, various particular financial instruments like equity shares, debentures, bond, treasury securities, currencies, etc. trades. There are now a large variety of financial futures contracts available at the various markets (centres) like Chicago, London, and Tokyo and so on.

Did u know? The first derivative product to be introduced in the Indian securities market is going to be "INDEX FUTURES". In the world, first index futures were traded in U.S. on Kansas City Board of Trade (KCBT) on Value Line Arithmetic Index (VLAI) in 1982.

4.1.1 Nature of Futures Contracts

A futures contract gives the holder the right and the obligation to buy or sell. Contrast this with an options contract, which gives the buyer the right, but not the obligation, and the writer (seller) the obligation, but not the right. In other words, an option buyer can choose not to exercise when it would be uneconomical for him/her. The holder of a futures contract and the writer of an option, do not have a choice. To exit the commitment, the holder of a future position has to sell his long position or buy back his short position, effectively closing the position. Futures contracts or simply futures are exchange-traded derivatives. The exchange acts as counterparty on all contracts, sets margin requirements, etc.

Futures contracts, unlike forwards, are traded on organised exchanges. They are traded in three primary areas:

- Agricultural Commodities

Notes

- Metals and Petroleum, and
- Financial Assets (individual stocks, indices, interest rate, currency).

4.1.2 Characteristics of Futures Contracts

Following are the salient features of futures contracts:

1. Futures are highly standardised contracts that provide for performance of contracts through either deferred delivery of asset or final cash settlement;
2. These contracts trade on organised futures exchanges with a clearing association that acts as a middleman between the contracting parties;
3. Contract seller is called 'short' and purchaser 'long'. Both parties pay margin to the clearing association. This is used as performance bond by contracting parties;
4. Margins paid are generally marked to market-price everyday;
5. Each futures contract has an associated month that represents the month of contract delivery or final settlement. These contracts are identified with their delivery months like July-Treasury bill, December $/DM etc.;
6. Every futures contract represents a specific quantity. It is not negotiated by the parties to the contract. One can buy or sell a number of futures contracts to match one's required quantity. Because of this feature, 100% hedging is not possible. There may be over or under-hedging to some extent.

4.1.3 Standardisation of Futures Contracts

Thus, futures contracts are highly standardised, to ensure that they are liquid. The standardisation usually involves specifying:

- The underlying this can be anything from a barrel of crude oil to a short-term interest rate;
- The type of settlement, either cash settlement or physical settlement;
- The amount and units of the underlying asset per contract. This can be the notional amount of bonds, a fixed number of barrels of oil, units of foreign currency, the notional amount of the deposit over which the short term interest rate is traded, etc.;
- The currency in which the futures contract is quoted;
- The grade of the deliverable. In the case of bonds, this specifies which bonds can be delivered. In the case of physical commodities, this specifies not only the quality of the underlying goods but also the manner and location of delivery;
- The delivery month;
- The last trading date;
- Other details such as commodity tick, the minimum permissible price fluctuation.

4.1.4 Categories of Futures Contracts

Futures contracts are of two major categories:

1. Financial Futures
2. Commodity Futures

Notes

Today, there are financial futures on debt instruments called interest rate futures, foreign exchange rate called currency futures and stock market averages called stock index futures. Financial futures are different from commodity futures in several ways. The most important difference is that many financial futures are not deliverable. The fact that very few contracts are actually delivered led many exchanges to consider eliminating the delivery feature all together. Till date this has not happened in commodity futures, but many financial futures are created as non-deliverable instruments. Stock index futures and interest rate futures are such futures. In place of delivery these contracts are cash settled on specific final delivery dates.

Caution The profit or loss from a futures contract that is settled at delivery is the difference between the value of the index at delivery and the value when originally purchased or sold. It is important to emphasise that the delivery at settlement cannot be in the underlying stocks but must be in cash. The futures index at expiration is set equal to the cash index on that day.

Self Assessment

Fill in the blanks:

1. If you buy a ……..... contract, you are basically agreeing to buy something that a seller has not yet produced for a set price.
2. The future date is called the ……..... date or final settlement date.
3. Futures contracts, unlike forwards, are traded on …….....
4. ……..... paid are generally marked to market-price everyday.
5. Contract seller is called ……..... and purchaser …….....

4.2 Distinction between Futures and Forwards Contracts

The basic form of the futures contract mirrors that of the forward contract: both parties are obligated under the terms of the contract either to deliver a specified asset or pay the specified price of the asset on the contract maturity date. Added to this, the futures contract entails the following two obligations, both of which help to minimise the default (or credit) risk inherent in forward contracts.

Did u know?

1. The value of the futures contract is 'settled' (i.e., paid or received) at the end of each trading day. In the language of the futures markets, the futures contract is 'cash settled', or 'mark/marked-to-market' daily. The marked-to-market provision effectively reduces the performance period of the contract to a day, thereby minimising the risk of default.
2. Both buyers and sellers are required to post a performance bond called 'margin'. At the end of each trading day, gains and losses are added to and taken away from the margin account, respectively. The margin account must remain above an agreed upon minimum or the account will be closed. The margin provision prevents the depletion of accounts, which, in turn, largely eliminates the risk of default.

The following are the distinguishing features between forwards and futures:

1. Delivery of the underlying is the hallmark of a forward contract. To the contrary the vast majority of futures contracts even though they provide for delivery are satisfied by entering

Notes

into an offsetting contract or selling the contract on the exchange namely, no delivery. This is the primary distinguishing feature of the forwards as given by the CFTC. Forwards also typically have been described by reference to the commercial natures of the counterparties which have the capacity to make or take delivery.

2. A forward contract is entered into for commercial purposes related to the business of the party wanting to enter into the forward. The producer, processor, fabricator, refiner, or merchandiser may want to purchase or sell a commodity for deferred shipment or delivery as part of the conduct of its business. In contrast, futures contracts are undertaken principally to assume or shift price risk without transferring the underlying commodity.

3. A forward contract is privately and individually negotiated between two principals. A futures contract is an exchange-traded contract, with standardised provisions including: commodity units; margin requirements related to price movements; clearing organisations that guarantee counterparty performance; open and competitive trading on exchanges; and public dissemination of price.

4. A forward contract generally is not assignable without the consent of the contracting parties and does not provide for an exchange-style offset. A futures contract is fungible, because of its standardised form, and hence can be traded on an exchange.

5. With a forward contract, no clearing house, no settlement system, and — according to CFTC—no variation margining is involved. All of these features apply to a futures contract.

Caselet

Hedging-Long Security, Sell Futures

Take the case of an investor who holds the shares of a company and gets uncomfortable with market movements in the short run. He sees the value of his security falling from ₹ 450 to ₹ 390. In the absence of stock futures, he would either suffer the discomfort of a price fall or sell the security in anticipation of a market upheaval. With security futures he can minimise his price risk. All he need do is enter into an offsetting stock futures position, in this case, take on a short futures position. Assume that the spot price of the security he holds is ₹ 390. Two-month futures cost him ₹ 402. For this he pays an initial margin. Now if the price of the security falls any further, he will suffer losses on the security he holds. However, the losses he suffers on the security will be offset by the profits he makes on his short futures position. Take for instance that the price of his security falls to ₹ 350. The fall in the price of the security will result in a fall in the price of futures. Futures will now trade at a price lower than the price at which he entered into a short futures position. Hence his short futures position will start making profits. The loss of ₹ 40 incurred on the security he holds, will be made up by the profits on his short futures position.

Source: Bishnupriya M., Sathya S. D. "*Financial Derivatives*". Excel Books (2007).

Futures contracts are standardised contracts that are traded on organised futures markets. Because contract sizes and maturities are standardised, all participants in the market are familiar with the types of contracts available, and trading is facilitated. Forward contracts, on the other hand, are private deals between two individuals who can sign any type of contract they agree on.

The organisation of futures trading with a clearing house reduces the default risks of trading. The exchange members, in effect, guarantee both sides of a contract. In contrast, a forward contract is a private deal between two parties and is subject to the risk that either side may default on the terms of the agreement.

Notes

Profits and losses of futures contracts are settled everyday at the end of trading, a practice called 'marking the market'. Daily settlements reduce the default risk of futures contracts relative to forward contracts. On a daily basis, futures investors must pay over any losses or receive any gains from the day's price movements. An insolvent investor with an unprofitable position would be forced into default after only one day's trading, rather than being allowed to build up huge losses that lead to one large default at the time the contract matures (as could occur with a forward contract). Futures contracts can also be closed out easily with an 'offsetting trade'.

Example: If a company's long position in $ futures has proved to be profitable, it need not literally take delivery of the $ at the time the contract matures. Rather, the company can sell futures contracts on a like amount of $ just prior to the maturity of the long position. The two positions cancel on the books of the futures exchange and the company receives its profit in cash.

These and other differences between forwards and futures are summarised below in Table 4.1:

Table 4.1: Distinction between Forwards and Futures

Criteria / Factors		Forwards	Futures
1.	Trading	Traded by telephone or telex (OTC)	Traded in a competitive arena (recognised exchange)
2.	Size of contracts	Decided between buyer and seller	Standardised in each futures market
3.	Price of contract	Remains fixed till maturity	Changes everyday
4.	Mark to Market	Not done	Marketed to market everyday
5.	Margin	No margin required	Margins are to be paid by both buyer and sellers
6.	Counter Party Risk	Present	Not present
7.	Number of contracts in a year	There can be any number of contracts	Number of contracts in a year is fixed.
8.	Frequency of Delivery	90% of all forward contracts are settled by actual delivery.	Very few future contracts are settled by actual delivery
9.	Hedging	These are tailor-made for specific date and quantity. So, it is perfect	Hedging is by nearest month and quantity contracts. So, it is not perfect.
10.	Liquidity	Not liquidity	Highly liquid
11.	Nature of Market	Over the Counter	Exchange traded
12.	Mode of Delivery	Specifically decided. Most of the contracts result in delivery	Standardised. Most of the contracts are cash-settled.
13.	Transactional Costs	Costs are based on bid-ask spread	Include brokerage fees for buy and sell others

Notes

Task Do you think that a web-enabled foreign exchange market would revolutionise the forex trading practices in the future? Elucidate with examples.

Self Assessment

State whether the following statements are true or false:

6. The value of the futures contract is 'settled' (i.e., paid or received) at the end of each trading day.
7. A forward contract is an exchange-traded contract.
8. The organisation of futures trading with a clearing house reduces the default risks of trading.

4.3 Futures Terminology

The important terminologies used in future contracts are described below:

- ***Spot price:*** The price at which an underlying asset trades in the spot market.
- ***Futures price:*** The price that is agreed upon at the time of the contract for the delivery of an asset at a specific future date.
- ***Contract cycle:*** It is the period over which a contract trades.

Caution The index futures contracts on the NSE have one-month, two-month and three-month expiry cycles which expire on the last Thursday of the month.

Thus, a January expiration contract expires on the last Thursday of January and a February expiration contract ceases trading on the last Thursday of February. On the Friday following the last Thursday, a new contract having a three-month expiry is introduced for trading:

- ***Expiry date:*** It is the date on which the final settlement of the contract takes place.
- ***Contract size:*** The amount of asset that has to be delivered for one contract. This is also called as the lot size.
- ***Basis:*** Basis is defined as the futures price minus the spot price. There will be a different basis for each delivery month for each contract. In a normal market, basis will be positive. This reflects that futures prices normally exceed spot prices.
- ***Cost of carry:*** Measures the storage cost plus the interest that is paid to finance the asset less the income earned on the asset.
- ***Initial margin:*** The amount that must be deposited in the margin account at the time a futures contract is first entered into is known as initial margin.
- ***Marking-to-market:*** In the futures market, at the end of each trading day, the margin account is adjusted to reflect the investor's gain or loss depending upon the futures closing price. This is called marking-to-market.

Self Assessment

Notes

Fill in the blanks:

9. …….is the price at which an underlying asset trades in the spot market.
10. ……...is the date on which the final settlement of the contract takes place.
11. …….is defined as the futures price minus the spot price.

4.4 Types of Future Contracts

Futures contracts are of three major categories. These are explained in the following sub-sections:

4.4.1 Stock Index Futures

These futures contract without actual delivery were introduced only in 1982 and are the most recent major futures contract to emerge. In the United States, these contracts trade on several market indices like Standard and Poor's 500, a major market index, the NYSE Index and the Value Line Index. Numerous contracts on industry indices are now trading as well.

A stock index futures contract is a contract to buy or sell the face value of the underlying stock index where the face value is defined as being the value of index multiplied by the specified monetary amount.

This device makes it possible to equate the value of the stock index with that of a specific basket of shares with the following specifications:

1. The total value of shares must match the monetary value of the index.
2. The shares selected must correspond to the set of shares used to create the index.
3. The amount of each holding must be in proportion to the market capitalisation of the companies.

Caution The profit or loss from a futures contract that is settled at delivery is the difference between the value of the index at delivery and the value when originally purchased or sold. It is important to emphasise that the delivery at settlement cannot be in the underlying stocks but must be in cash. The futures index at expiration is set equal to the cash index on that day.

4.4.2 Commodity Futures

The commodity futures include:

1. ***Agricultural futures contracts:*** These contracts are traded in grains, oil and meal, livestock, forest products, textiles and foodstuff. Several different contracts and months for delivery are available for different grades or types of commodities in question. The contract months depend on the seasonality and trading activity.
2. ***Metallurgical futures contract:*** This category includes genuine metal and petroleum contracts. Among the metals, contracts are traded on gold, silver, platinum and copper. Of the petroleum products, only heating oil, crude oil and gasoline are traded.

Notes

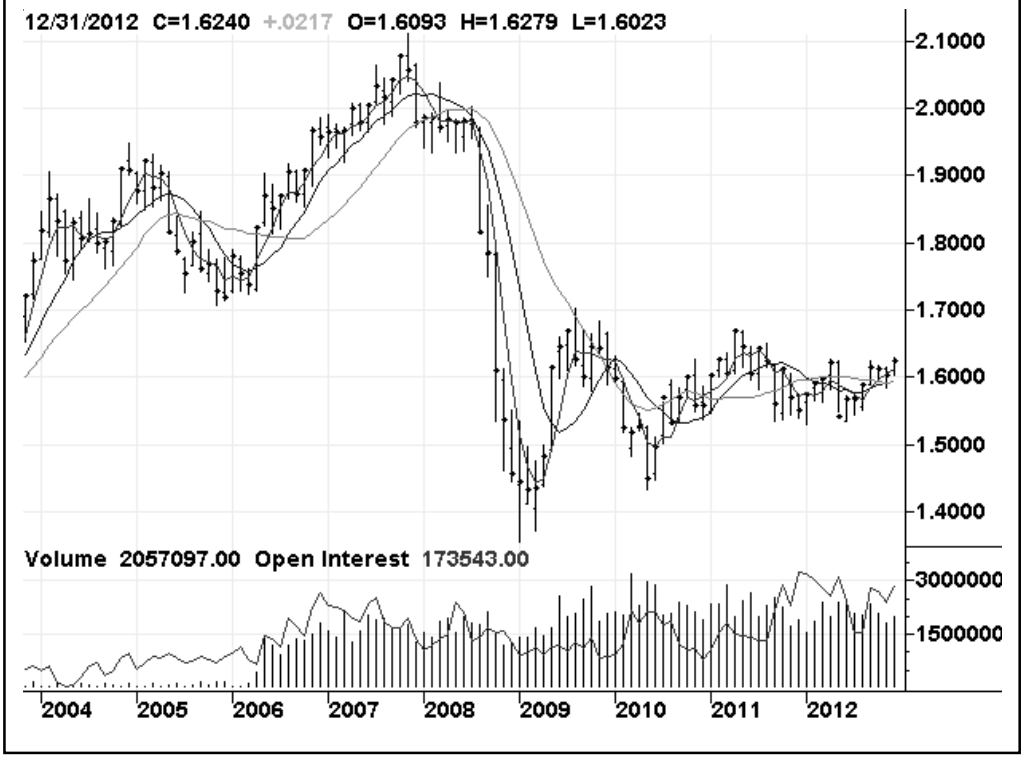
4.4.3 Currency Futures

Currency future is the price of a particular currency for settlement at a specified future date. Currency futures are traded on future exchanges and the exchanges where the contracts are fungible (or transferable freely) are very popular. The two most popular future exchanges are the Singapore International Monetary Exchange (SIMEX) and the International Money Market, Chicago (IMM). Other exchanges are in London, Sydney, Frankfurt, New York, Philadelphia, etc.

The first exchange-traded foreign currency futures contracts were launched on the International Monetary Market (IMM) – now part of the Chicago Mercantile Exchange (CME) – in 1972. Seven currencies were traded and others have since been added. The CME remains the most active market in these contracts to this day, though a number of other exchanges have launched their own contracts. The figure 4.1 shows the monthly price chart of CME British Pound.

Today, there are financial futures on debt instruments called interest rate futures, foreign exchange rate called currency futures and stock market averages called stock index futures. Financial futures are different from commodity futures in several ways. The most important difference is that many financial futures are not deliverable. The fact that very few contracts are actually delivered led many exchanges to consider eliminating the delivery feature all together. Till date this has not happened in commodity futures, but many financial futures are created as non-deliverable instruments. Stock index futures and interest rate futures are such futures. In place of delivery, these contracts are cash settled on specific final delivery dates. Badla trading in India was the predecessor of futures and forwards trading.

Figure 4.1: The Monthly price chart of CME British Pound



Source: http://futures.tradingcharts.com/chart/BP/

Notes

Did u know? Interest rate futures contract allows the buyer of the contract to lock in a future investment rate; not a borrowing rate as many believe. Interest rate futures are based off an underlying security which is a debt obligation and moves in value as interest rates change.

When interest rates move higher, the buyer of the futures contract will pay the seller in an amount equal to that of the benefit received by investing at a higher rate versus that of the rate specified in the futures contract. Conversely, when interest rates move lower, the seller of the futures contract will compensate the buyer for the lower interest rate at the time of expiration.

Self Assessment

Fill in the blanks:

12. A ..... futures contract is a contract to buy or sell the face value of the underlying stock index.
13. The first exchange-traded foreign currency futures contracts were launched on the .....
14. The futures index at expiration is set equal to the ..... on that day.
15. ..... trading in India was the predecessor of futures and forwards trading.

Case Study

Currency Hedging at HCL Tech

"In this quarter (Apr-Jun 2009), we have cancelled some hedges that were to mature by December 2009. These were the same hedges that were taken in late 2007 and early 2008 before the global meltdown took place. But the forex losses are already reflected in the P&L account to the extent these are marked-to-market and the rest are reflected in the balance sheet. They will flow through the P&L over the next seven quarters, irrespective of the cancellation of these hedges."

Anil Chanana, EVP, Finance, HCL Technologies Limited, May 2009.

On May 16, 2009, one of the leading global IT players in India, HCL Technologies Limited (HCL Tech), announced the cancellation of currency hedging contracts worth US$ 600 million or around ₹ 29.70 billion. The announcement came in the wake of an unexpected rise in the value of the US dollar against the Indian rupee which touched the level of ₹ 52.5 in March 2009. According to industry analysts, the company had taken these contracts during 2007-08 when the rupee was at approximately ₹ 41 against the dollar. Analysts estimated that the cancellation of the hedges would lead to a loss of ₹ 4,000 million to ₹ 5,000 million for the company in the next few quarters, which would subsequently affect the dividend payout.

HCL Tech, which was known to hedge heavily, had a forward hedge cover of US$ 1.30 billion at the end of the third quarter of FY 09. However, this went down to US$ 813 million at the end of the fourth quarter of FY 09. Canceling of forward cover was not new to the company - in FY 08, it unwound a US$ 540 million cover, incurring a cash loss of US$ 9 million in the process.

Contd...

Notes

Experts were divided over HCL Tech's decision to cancel its currency forward hedge. According to an analyst, "It's a one-time act that the company is taking to clean up the balance sheet. After this, the numbers can focus on its operations rather than get impacted by currency fluctuations. Of course, this will impact the company's surplus cash reserve as well, as in the next few quarters the dividend payout might get negatively impacted." According to an ICICI Securities report, the loss on account of cancellation of these contracts would be ₹ 5,200 million at the spot rate of ₹ 49.69 against the hedge rate of ₹ 41. However, according to the management, the cancellation was likely to be spread out.

The report also mentioned that the loss due to cancellation would be debited in the respective quarters of maturity as against the earlier policy of booking losses in the quarter of cancellation. The report expressed the view that the new policy was fair and in accordance with the US GAAP and that it reduced earnings volatility.

Some analysts held the opposite view. HCL Tech had unwound the covers for the currency forward, putting them in an un-hedge position, as company inflows would be converted at the spot rate. This fundamentally defeated the very purpose of the company's hedging policy, they said. With the cancellation of the currency hedge, the company might benefit if the rupee continued to further depreciate. Analysts expressed concern about the company's position should the rupee appreciate further against the US dollar. They even opined that this cancellation raised the basic question of how HCL Tech could hedge or manage the currency exposure as most of the revenue came in foreign currency terms.

HCL Tech, a leading global IT player, had a presence in 18 countries at 60 locations all over the world. It was the fifth largest Indian IT player as of 2008 with a 3% contribution in the IT-ITES sector. It provided a wide range of IT-related products and services to mid- and large size enterprises all over the world with the help of more than 50,000 employees.

As a major part of HCL Tech's revenue was generated from outside India, the cash flows of the company were influenced by currency movements. The company therefore used derivative financial instruments like foreign currency forwards to hedge its currency risk for a certain forecasted period.

The Indian Rupee (INR) recorded its strongest mark against the US Dollar (USD) in November 2007 at ₹ 39, having strengthened by around 11% from ₹ 44 per dollar at the beginning of the year 2007. The strengthening of the Indian Rupee was mainly due to the depreciation in the USD. The depreciation was mainly due to the slowdown in the US economy, high spending on wars, and the negative balance of payment in the US. In the same year, foreign capital investment in India increased.

HCL Tech took the forward hedge covers for the next coming 7 to 10 quarters, depending upon the earnings visibility and forex market. As the rupee appreciated from ₹ 44.27 per dollar in January 2007 to ₹ 39.45 per dollar in November 2007, HCL Tech reported a huge forex gain as it had already covered its revenues at around ₹ 44 per dollar.

As the company reported on a mark-to-market basis, the gains or losses occurring from the forward hedge covers of future quarter revenues caused huge fluctuations in its reported profits. This also created a mismatch between the reported revenues and the forex losses/ gains.

With the cancellation of currency hedges, industry analysts opined that the company's move toward unhedged currency forwards reflected its expectations that the rupee would depreciate against the dollar and sustain at ₹ 47 to ₹ 50 in the short to medium term. But they wondered what the company's position would be if the rupee appreciated above ₹ 47 against the dollar.

Contd...

Notes

Questions:

1. Find out the HCL Tech's foreign exchange hedge accounting policy.
2. What are the currencies hedging strategies adopted by HCL Tech in accordance with Rupee Fluctuations?
3. Find out the forward cover cancellations of HCL Tech.

Source: http://www.icmrindia.org

4.5 Summary

- The futures market is a global market place, initially created as a place for farmers and merchants to buy and sell commodities for either spot or future delivery.
- This was done to lessen the risk of both waste and scarcity.
- Rather than trade in physical commodities, futures markets buy and sell futures contracts, which state the price per unit, type, value, quality and quantity of the commodity in question, as well as the month the contract expires.
- The players in the futures market are hedgers and speculators.
- A hedger tries to minimise risk by buying or selling now in an effort to avoid rising or declining prices.
- Conversely, the speculator will try to profit from the risks by buying or selling now in anticipation of rising or declining prices.
- Futures accounts are credited or debited daily, depending on profits or losses incurred.
- Daily settlements reduce the default risk of futures contracts relative to forward contracts.
- Currency future is the price of a particular currency for settlement at a specified future date.
- Today, there are financial futures on debt instruments called interest rate futures, foreign exchange rate called currency futures and stock market averages called stock index futures.

4.6 Keywords

Agricultural futures contracts: These contracts are traded in grains, oil and meal, livestock, forest products, textiles and foodstuff.

Commodity Future Contract: An agreement to buy or sell a set amount of a commodity at a predetermined price and date.

Contract size: The amount of asset that has to be delivered for one contract. This is also called as the lot size.

Currency Future: Currency future is the price of a particular currency for settlement at a specified future date.

Mark to Market: The accounting act of recording the price or value of a security, portfolio or account to reflect its current market value rather than its book value.

Metallurgical futures contract: This contract includes genuine metal and petroleum contracts. Among the metals, contracts are traded on gold, silver, platinum and copper.

Notes

Offset: Elimination or reduction of a current long or short position by making an opposite transaction of the same security.

Portfolio: The group of assets - such as stocks, bonds and mutual funds - held by an investor.

Stock index futures: These futures contract without actual delivery were introduced only in 1982 and are the most recent major futures contract to emerge.

4.7 Review Questions

1. What is a futures contract? Explain with examples.
2. Discuss the types of financial futures contracts and explain its uses.
3. Discuss the types of traders in futures markets with suitable examples.
4. Discuss the statement: 'The basic function of futures contract is hedging'.
5. Briefly highlight the various methods of settling future contracts.
6. Compare and contrast between forward contracts and futures contracts with suitable examples.
7. The payoff for a person who buys a futures contract is similar to the payoff for a person who holds an asset. Discuss with suitable example.
8. If the index goes down, his futures position starts making profit. If the index rises, his futures start showing losses. Discuss.
9. Write down the various types of future contracts.

Answers: Self Assessment

1.	Futures	2.	Delivery
3.	Organised exchanges	4.	Margins
5.	Short, long	6.	True
7.	False	8.	True
9.	Spot Price	10.	Expiry Date
11.	Basis	12.	Stock index
13.	International Monetary Market (IMM)	14.	Cash index
15.	Badla		

4.8 Further Readings

Books

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Notes

Unit 5: Introduction to Options

CONTENTS

Objectives

Introduction

5.1 Options Contracts

5.1.1 Features of the Options Contracts

5.1.2 Options that are Currently Traded in the Market

5.2 Option Terminology

5.3 Types of Options

5.3.1 Call Option

5.3.2 Put Option

5.4 Distinction between Futures and Options

5.4.1 Comparison between Futures and Options

5.5 Index Derivatives

5.5.1 Features of Index Derivatives

5.5.2 Contract Specification for Index Options

5.5.3 Contract Specifications for Stock Futures

5.6 Summary

5.7 Keywords

5.8 Review Questions

5.9 Further Readings

Objectives

After studying this unit, you should be able to:

- Discuss the meaning and features of options contracts;
- Define the key terms used in options;
- Describe the basic types of options;
- Distinguish between futures and options;
- Explain the meaning and features of index derivatives.

Introduction

In the previous unit, we studied about the concept of future contracts and the terminologies used in it. We also discussed about the distinction between futures and forwards contracts. This unit will helps you to understand the concept of and features of options contracts. We will also discuss the key terms used in options. The various sections and sub section of this unit will also summarise the basic types of options, distinction between futures and options and concept of index derivatives.

As seen earlier, futures are derivative instruments where one can take a position for an asset to be delivered at a future date. But there is also an obligation as the seller has to make delivery and

Notes

buyer has to take delivery. Options are one better than futures. In option, as the name indicates, gives one party the option to take or make delivery. But this option is given to only one party in the transaction while the other party has an obligation to take or make delivery. The asset can be a stock, bond, index, currency or a commodity. But since the other party has an obligation and a risk associated with making good the obligation, he receives a payment for that. This payment is called as premium.

In April 1973, the options on stocks were first traded on an organised exchange, i.e., Chicago Board Options Exchange. Since then, there has been a dramatic growth in options markets. Options are now traded on various exchanges in various countries all over the world. Options are now traded both on organised exchanges and over-the-counter (OTC). The option trading mechanism on both are quite different and which leads to important differences in market conventions. Recently, options contracts on OTC are getting popular because they are more liquid. Further, most of the banks and other financial institutions now prefer the OTC options market because of the ease and customised nature of contract.

5.1 Options Contracts

Options are the most important group of derivative securities. Option may be defined as a contract, between two parties whereby one party obtains the right, but not the obligation, to buy or sell a particular asset, at a specified price, on or before a specified date. The person who acquires the right is known as the option buyer or option holder, while the other person (who confers the right) is known as option seller or option writer. The seller of the option for giving such option to the buyer charges an amount which is known as the option premium.

Example: Suppose the current price of CIPLA share is ₹ 750 per share. X owns 1000 shares of CIPLA Ltd. and apprehends in the decline in price of share. The option (put) contract available at BSE is of ₹ 800, in next two-month delivery. Premium cost is ₹ 10 per share. X will buy a put option at 10 per share at a strike price of ₹ 800. In this way X has hedged his risk of price fall of stock. X will exercise the put option if the price of stock goes down below ₹ 790 and will not exercise the option if price is more than ₹ 800, on the exercise date. In case of options, buyer has a limited loss and unlimited profit potential unlike in case of forward and futures.

Options can be divided into two types: calls and puts. A call option gives the holder the right to buy an asset at a specified date for a specified price whereas in put option, the holder gets the right to sell an asset at the specified price and time. The specified price in such contract is known as the exercise price or the strike price and the date in the contract is known as the expiration date or the exercise date or the maturity date. The asset or security instrument or commodity covered under the contract is called as the underlying asset. They include shares, stocks, stock indices, foreign currencies, bonds, commodities, futures contracts, etc. Further options can be American or European. A European option can be exercised on the expiration date only whereas an American option can be exercised at any time before the maturity date.

Example: You discover a house that you would love to purchase. Unfortunately, you do not have the cash to buy it for another three months. You talk to the owner and negotiate a deal that gives you an option to buy the house in three months for a price of ₹ 200,000. The owner agrees, but for this option, you pay a price of ₹ 3,000.

Now, consider two theoretical situations that might arise:

1. It has been discovered that the house is of historical importance and as a result, the market value of the house skyrockets to ₹ 10,00,000. Because the owner sold you the option, he is obligated to sell you the house for ₹ 200,000. In the end, you stand to make a profit of ₹ 7,97,000 (₹ 10,00,000 – ₹ 2,00,000 – ₹ 3,000).

Notes

2. While touring the house, you discover that the house is not in proper living conditions. Though you originally thought you had found the house of your dreams, you now consider it worthless. On the upside, because you bought an option, you are under no obligation to go through with the sale. Of course, you still lose the ₹ 3,000 price of the option that is non-refundable.

This example demonstrates two very important points.

First, when you buy an option, you have a right but not an obligation to do something. You can always let the expiration date go by, at which point the option becomes worthless.

Caution If this happens, you lose 100% of your investment (option premium), which is the money you used to pay for the option.

Second, an option is merely a contract that deals with an underlying asset. For this reason, options are called derivatives, which mean an option derives its value from something else. In our example, the house is the underlying asset.

5.1.1 Features of the Options Contracts

Following are the features of the options contracts:

- Option contract gives the holder the right to do something.
- The holder may exercise his option or may not.
- The holder can make a reassessment of the situation and seek either the execution of the contracts or its non-execution as be profitable to him.
- He is not under obligation to exercise the option.
- So, this fact distinguishes options from forward contracts and futures con-tracts, where the holder is under obligation to buy or sell the underlying asset. Recently in India, the banks are allowed to write cross-currency options after obtaining the permission from the Reserve Bank of India.

5.1.2 Options that are Currently Traded in the Market

The options that are currently traded in the market are index options and stock options on the 30 stocks. The index options are European options. They are settled on the last day. The stock options are American options. There are 3 options: 1, 2, 3 month options. There can be a series of option within the above time span at different strike prices. Another lingo in option is *Near and Far options*. A near option means the option is closer to expiration date. A Far option means the option is farther from expiration date.

Notes

(a) A 1 month option is a near option while a 3 month option is a far option.

(b) In option trading, what gets quoted in the exchange is the premium and all that people buy and sell is the premium.

Self Assessment

Notes

Fill in the blanks:

1. Options can be divided into two types: …….. and ……..
2. A …….. option can be exercised on the expiration date only whereas an …….. option can be exercised at any time before the maturity date.
3. The options that are currently traded in the market are …… options and …….. options on the 30 stocks.

5.2 Option Terminology

The following are the key terms used in options:

1. ***Buyer of an option:*** The option buyer is the person who acquires the rights conveyed by the option: the right to purchase the underlying futures contract if the option is a call or the right to sell the underlying futures contract if the option is a put.

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

2. ***Writer of an option:*** The option seller (also known as the option writer or option grantor) is the party that conveys the option rights to the option buyer. In other words, the writer of a call/put option is the one who receives the option premium and is thereby obliged to sell/buy the asset if the buyer exercises on him.
3. ***Option Class:*** All calls and puts on a given underlying security or index represent an "option class." In other words, all calls and puts on XYZ stock are one class of options, while all calls and puts on ZYX index are another class.
4. ***Option Series:*** All options of a given type (calls or puts) with the same strike price and expiration date are classified as an "option series."

   Example: All XYZ June 110 calls would be an individual series, while all XYZ June 110 puts would be another series.

5. ***Contract Size of Equity Options:*** The contract size of an option refers to the amount of the underlying asset covered by the options contract. For each unadjusted equity call or put option, 100 shares of stock (usually, but this may differ from stocks to stocks) will change hands when one contract is exercised by its owner. These 100 shares of underlying stock are also referred to as the contract's "unit of trade."
6. ***Contract Size of Index Options:*** The contract size of a cash-settled index option is determined by its multiplier. The multiplier determines the aggregate value of each point of the difference between the exercise price of the option and the exercise settlement value of the underlying interest.

   Example: A multiplier of 100 means that for each point by which a cash-settled option is in the money upon exercise, there is a $100 increase in the cash settlement amount.

7. ***Option price:*** Option price is the price which the option buyer pays to the option seller. It is also referred to as the option premium.

Notes

8. ***Expiration date:*** The date specified in the options contract is known as the expiration date, the exercise date, the strike date or the maturity.

9. ***Strike Price (K):*** Also known as the "exercise price," this is the stated price at which the buyer of a call has the right to purchase a specific futures contract or at which the buyer of a put has the right to sell a specific futures contract. The exchanges decide the strike price at which call and put options are traded. Generally, to simplify matters, the exchanges specify the strike price interval for different levels of underlying prices, meaning the difference between one strike price and the next strike price over and below it.

   Illustration: The strike price interval for Bharat Heavy Electricals is ₹ 10. This means that there would be strike prices available with an interval of ₹ 10. Typically, the investor can see options on Bharat Heavy Electricals with strike prices of ₹ 150, ₹ 160, ₹ 170, ₹ 180, ₹ 190 etc.

   As the price of underlying moves up or down, the exchanges introduce more strike prices in keeping with the strike price interval rules. At any point in time, there are at least five strike prices (one near the stock price, two above the stock price and two below the stock price) available for trading in one-, two- and three-month contracts.

   Following (Table 5.1) are the strike price intervals specified by exchanges:

Table 5.1: Strike Price Intervals for Options

Price level of Underlying	Strike Price Interval (In ₹)
Less than or equal to 50	2.5
Above 50 to 250	5.0
Above 250 to 500	10.0
Above 500 to 1000	20.0
Above 1000 to 2500	30.0
Above 2500	50.0

10. ***American options:*** American options are options that can be exercised at any time up to the expiration date. Most exchange-traded options are American.

11. ***European options:*** European options are options that can be exercised only on the expiration date itself. European options are easier to analyse than American options, and properties of an American option are frequently deduced from those of its European counterpart.

12. ***Index options:*** These options have the index as the underlying. Some options are European while others are American. Like index futures contracts, index options contracts are also cash settled.

13. ***Stock options:*** Stock options are options on individual stocks. Options currently trade on over 500 stocks in the United States. A contract gives the holder the right to buy or sell shares at the specified price.

14. ***Option Premium:*** The "price" an option buyer pays and an option writer receives is known as the premium. Premiums are arrived at through open competition between buyers and sellers according to the rules of the exchange where the options are traded. A basic knowledge of the factors that influence option premiums is important for anyone considering options trading. The premium cost can significantly affect whether the investor realise a profit or incur a loss.

Notes

Did u know? Option premium is the price at which an option trades, and is paid by the buyer to the writer (seller) of the contract. The premium paid by the buyer is non-refundable payment for the rights inherent in the long contract. The writer (seller) of an option contract keeps the premium received, whether assigned or not, and is in turn obligated to fulfil the short contract's obligations if assignment is received. The two components of an option's total premium are intrinsic value and time value.

15. ***Moneyness:*** In finance, moneyness is a measure of the degree to which a derivative is likely to have positive monetary value at its expiration, in the risk-neutral measure. There are three positions in options: In-the-money; At-the-money; and Out-of-the-money.

    (a) ***In-the-money option:*** An in-the-money (ITM) option is an option that would lead to a positive cash flow to the holder if it were exercised immediately. A call option on the index is said to be in-the-money when the current index stands at a level higher than the strike price (i.e. spot price >strike price). If the index is much higher than the strike price, the call is said to be deep ITM. In the case of a put, the put is ITM if the index is below the strike price.

    (b) ***Out-of-the-money option:*** An out-of-the-money (OTM) option is an option that 'leads to a negative cash flow if it were exercised immediately. A call option on the index is out-of-the-money when the current index stands at a level which is less than the strike price (i.e. spot price < strike price). If the index is much lower than the strike price, the call is said to be deep OTM. In the case of a put, the put is OTM if the index is above the strike price.

    An out-of-the-money option currently has no intrinsic value e.g. a call option is out-the-money if the strike price ("the strike") is higher than the current underlying price. An in-the-money option conversely does have intrinsic value.

    Caution The strike price of an in-the-money call option is lower than the current underlying price.

    (c) ***At-the-money option:*** An at-the-money (ATM) option is an option that would lead to zero cash flow if it were exercised immediately. An option on the index is at-the-money when the current index equals the strike price (i.e. spot price = strike price). In other words, an option is at-the-money if the strike price, i.e., the price the option holder must pay to exercise the option, is the same as the current price of the underlying security on which the option is written.

    Example: Suppose the current stock price of SBI is ₹ 1,000. A call or put option with a strike of ₹ 1,000 is at-the-money. A call option with a strike of ₹ 800 is in-the-money (1000 - 800 = 200 > 0). A put option with a strike at ₹ 800 is out-of-the-money (800 - 1000 = -200 < 0). Conversely, a call option with a ₹ 1200 strike is out-of-the-money and a put option with a ₹ 1,200 strike is in-the-money.

16. ***Intrinsic value of an option:*** The option premium can be broken down into two components — intrinsic value and time value. The intrinsic value of a call is the amount the option is ITM, if it is ITM. If the call is OTM, its intrinsic value is zero. Putting it another way, the intrinsic value of a call is Max [0, (S_t- K)] which means the intrinsic value of a call is the greater of 0 or (S_t- K). Similarly, the intrinsic value of a put is, Max [0, (K- S)} i.e. the greater value of 0 or (K- S_t). St is the spot price at time t; K is the strike price.

Notes

17. ***Time value of an option:*** The time value of an option is the difference between option's time values, all else being equal. At expiration, an option should have no time value.

Self Assessment

Fill in the blanks:

4. ..... is also referred to as the option premium.
5. ..... options are options that can be exercised at any time up to the expiration date.
6. ..... options is options that can be exercised only on the expiration date itself.
7. The option premium can be broken down into two components - intrinsic value and .....
8. A call option on the index is out-of-the-money when the current index stands at a level which is less than the .....

5.3 Types of Options

There are two basic types of options-call options and put options:

1. ***Call option:*** A call option gives the holder the right but not the obligation to buy an asset by a certain date for a certain price.
2. ***Put option:*** A put option gives the holder the right but not the obligation to sell an asset by a certain date for a certain price.

Did u know? The money made in an option is called as the option pay off. There can be two pay off for options, for put and call option

The price of options is decided between the buyers and sellers on the trading screens of the exchanges in a transparent manner. The investor can see the best five orders by price and quantity. The investor can place a market limit order, stop loss order, etc. The investor can modify or delete his pending orders. The whole process is similar to that of trading in shares.

In simple words, a call option gives the holder the right to buy an asset at a certain price within or at the end of a specific period of time. Calls are similar to having a long position on a stock. Buyers of calls hope that the stock will increase substantially before the option expires.

Similarly, a put option gives the holder the right to sell an asset at a certain price within or at the end of a specific period of time. Puts are similar to having a short position on a stock. Buyers of put options hope that the stock will decrease substantially before the option expires.

An investor with a long equity call or put position may exercise that contract at any time before the contract expires, up to and including the Friday (in the Indian stock market) before its expiration. To do so, the investor must notify his brokerage firm of intent to exercise in a manner, and by the deadline specified by that particular firm.

Any investor with an open short position in a call or put option may nullify the obligations inherent in that short (or written) contract by making an offsetting closing purchase transaction of a similar option (same series) in the marketplace. This transaction must be made before the assignment is received, regardless of whether you have been notified by your brokerage firm to this effect or not.

Notes

Notes Various other types of options are listed below:

Real options: A real option is a choice that an investor has when investing in the real economy (i.e. in the production of goods or services, rather than in financial contracts). This option may be something as simple as the opportunity to expand production, or to change production inputs. Real options are an increasingly influential tool in corporate finance. The liquidity of this kind of exchange-traded options is relatively lower.

Traded options - (Exchange-Traded Options): Traded Options are, Exchange-traded derivatives, as the name implies. As for other classes of exchange traded derivatives, they have: standardised contracts; quick systematic pricing and are settled through a clearing house (ensuring fulfilment).

Vanilla and exotic options: Generally speaking, a vanilla option is a 'simple' or well understood option, whereas an exotic option is more complex, or less easily understood (hybrid options). European options and American options on stock and bonds are usually considered to be "plain vanilla". Asian options, look back options, barrier options are often considered to be exotic, especially if the underlying instrument is more complex than simple equity or debt.

5.3.1 Call Option

A call option gives the holder a right to buy shares. The option holder will make money if the spot price is higher than the strike price. The pay off assumes that the option holder will buy at the strike price and sell immediately at the spot price. But if the spot price is lower than the strike, the option holder can simply ignore the option. It will be cheaper to buy from the market. The option holder loss is to the extent of premium he has paid. But if the spot price increases dramatically then he can make wind fall profits. Thus the profits for an option holder in a call option are unlimited while losses are capped to the extent of the premium. Conversely, for the writer, the maximum profit he can make is the premium amount. But the losses he can make are unlimited.

5.3.2 Put Option

The put option gives the right to sell. The option holder will make money if the spot price is lower than the strike price. The pay off assumes that the option holder will buy at spot price and sell at the strike price But if the spot price is higher than the strike, the option holder can simply ignore the option. It will be beneficial to sell to the market.

The option holder loss is to the extent of premium he has paid. But if the spot prices fall dramatically then he can make wind fall profits. Thus the profits for an option holder in a put option are unlimited while losses are capped to the extent of the premium. This is a theoretical fallacy as the maximum fall a stock can have is till zero, and hence the profit of an option holder in a put option is capped.

Conversely, the maximum profit that an option writer can make in this case is the premium amount. But in the above pay off, we had ignored certain costs like premium and brokerage. These are also important, especially the premium. So, in a call option for the option holder to make money, the spot price has to be more than the strike price plus the premium amount. If the spot is more than the strike price but less than the sum of strike price and premium, the option holder can minimise losses but cannot make profits by exercising the option.

Similarly, for a put option, the option holder makes money if spot is less than the strike price less the premium amount. If the spot is less than the strike price but more than the strike price less premium, the option holder can minimise losses but cannot make profits by exercising the option.

Notes

Illustration: The call option for Reliance is selling at ₹ 10 for a strike price of ₹ 330. What will be the profit for the option holder if the spot price touches (a) ₹ 350 (b) ₹ 337?

Solution:

(a) The option holder can buy Reliance at a price of ₹ 330.

He has also paid a premium of ₹ 10 for the same. So his cost of a share of

Reliance is ₹ 340.

He can sell the same in the spot market for ₹ 350.

He makes a profit of ₹ 10

(b) The option holder can buy Reliance at a price of ₹ 330.

He has also paid a premium of ₹ 10 for the same. So his cost of a share of Reliance is ₹ 340.

He can sell the same in the spot market for ₹ 337

He makes a loss of ₹ 3.

But he has reduced his losses by exercising the option. Had he not exercised the option, he would have made a loss of ₹ 10, which is the premium that he paid for the option.

Caselet

Trading in Stocks

Company XYZ in trading at ₹ 25 per share and Shraddha believe the stock is headed up. Shraddha could buy shares of the stock or she could buy a call option. Say a call option that gives her the right, but not the obligation, to buy 100 shares of XYZ anytime in the next 90 days for ₹ 26 per share could be purchased for ₹ 100.

If she is right and the stock rises to ₹ 30 per share before option expires, she could exercise her option and buy 100 shares at ₹ 26 per share and sell them for an immediate profit of ₹ 3 per share (₹ 30 - ₹ 26 = ₹ 4 - ₹ 1 for the option = ₹ 3 per share profit).

Shraddha could also simply trade the option for a profit without actually buying the shares of stock.

If Shraddha had figured wrong and the stock went nowhere or fell from the original ₹ 26 per share to ₹ 24 per share, she would simply let the option expire and suffer only a ₹ 100 loss (the cost of the option).

If Shraddha felt the stock was about to tank from ₹ 25 per share, the only way to profit would be to short the stock, which can be a risky move if she is wrong.

She could purchase a put option at ₹ 24 per share for ₹ 100 (or ₹ 1 per share), which would give her the right to sell 100 shares of XYZ at ₹ 24 per share.

If the stock drops to ₹ 19 per share, she could, in theory buy 100 shares on the open market for ₹ 19 per share, then exercise she put option giving her the right to sell the stock at ₹ 24 per share – making a ₹ 5 per share profit, minus the option cost.

Option cost

As a practical matter, she would trade her put option, which would now be worth something close to ₹ 5 per share or ₹ 500.

Source: http://futures.quote.com/education/

Self Assessment

Notes

State whether the following statements are true or false:

9. A put option gives the holder the right but not the obligation to buy an asset by a certain date for a certain price.
10. A call option gives the holder the right but not the obligation to sell an asset by a certain date for a certain price.
11. European options and American options on stock and bonds are usually considered to be "plain vanilla".
12. Asian options, look back options, barrier options are often considered to be exotic, especially if the underlying instrument is more complex than simple equity or debt.
13. The price of options is decided between the buyers and sellers on the trading screens of the exchanges in a transparent manner.

5.4 Distinction between Futures and Options

In case of futures, both the buyer and the seller are under obligation to fulfil the contract. They have unlimited potential to gain if the price of the underlying moves in their favour. On the contrary, they are subject to unlimited risk of losing if the price of the underlying moves against their views. In case of options, however, the buyer of the option has the right and not the obligation. Thus he enjoys an asymmetric risk profile. He has unlimited potential to profit if the price of the underlying moves in his favour. But a limited potential to lose, to the extent of the premium paid, in case the price of the underlying moves against the view taken. Similarly, the seller of the option is under obligation. He has limited potential to profit, to the extent of the premium received, in case the price of the underlying moves in his favour, but an unlimited risk of losing in case the price of the underlying moves against the view taken.

Further with regards to behaviour of prices, trading in futures is one-dimensional as the price of futures depends upon the price of the underlying only.

Did u know? Trading in options is two- dimensional as the price of an option depends upon both the price and the volatility of the underlying.

5.4.1 Comparison between Futures and Options

Options are different from futures in several interesting senses. At a practical level, the option buyer faces an interesting situation. He pays for the option in full at the time it is purchased. After this, he only has an upside. There is no possibility of the options position generating any further losses to him (other than the funds already paid for the option). This is different from futures, which is free to enter into, but can generate very large losses. This characteristic makes options attractive to many occasional market participants, who cannot put in the time to closely monitor their futures positions. Table 5.2 presents the comparison between the futures and options. Buying put options is buying insurance. To buy a put option on Nifty is to buy insurance which reimburses the full extent to which Nifty drops below the strike price of the put option. This is attractive to many people, and to mutual funds creating "guaranteed return products".

Notes

Table 5.2: Comparison between Futures and Options

Futures	Options
Exchange traded, with novation	Same as futures
Exchange defines the product	Same as futures
Price is zero, strike price moves	Strike price is fixed, price moves
Price is zero	Price is always positive
Linear payoff	Nonlinear payoff
Both long and short at risk	Only short at risk

More generally, options offer "nonlinear payoffs" whereas futures only have "linear payoffs". By combining futures and options, a wide variety of innovative and useful payoff structures can be created.

Task Consider a put option on 200 ounces of gold struck at USD 400. What will be the put's USD expiration value, if the market price of gold is USD 380 when the option expires?

Self Assessment

State whether the following statements are true or false:

14. In case of forward, both the buyer and the seller are under obligation to fulfil the contract.
15. Buying put options is buying insurance.
16. Trading in options is two- dimensional as the price of an option depends upon both the price and the volatility of the underlying.

5.5 Index Derivatives

Index derivatives are derivative contracts which derive their value from an underlying index. The two most popular index derivatives are index futures and index options. Index derivatives have become very popular worldwide. Index derivatives offer various advantages and hence have become very popular. Institutional and large equity-holders need portfolio-hedging facility. Index-derivatives are more suited to them and more cost-effective than derivatives based on individual stocks. Pension funds in the US are known to use stock index futures for risk hedging purposes.

Index derivatives are a powerful tool for risk management for anyone who has portfolios composed of positions in equity. Using index futures and index options, investors and portfolio managers can hedge themselves against the risk of a downturn in the market when they should so desire.

Example: For many investors the volatility associated with the budget might not be a ride that they wish to bear. Today, in the absence of index derivatives, the investor has only one alternative: to sell off equity, and move into cash or debentures, prior to the budget. Roughly a month after the budget, once the budget-related volatility has subsided, these transactions could be reversed, and the person would be back to the original equity exposure.

Notes

Index derivatives offer ease of use for hedging any portfolio irrespective of its composition. Stock index is difficult to manipulate as compared to individual stock prices, more so in India, and the possibility of cornering is reduced. This is partly because an individual stock has a limited supply, which can be concerned. Stock index, being an average, is much less volatile than individual stock prices. This implies much lower capital adequacy and margin requirements.

Index derivatives are cash settled, and hence do not suffer from settlement delays and problems related to bad delivery, forged/fake certificates.

Caution Index derivatives are cash settled, and hence do not suffer from settlement delays and problems related to bad delivery, forged/fake certificates.

5.5.1 Features of Index Derivatives

Following are the features of Index derivatives:

1. ***The index is hard to manipulate:*** Derivatives in individual securities are vulnerable to market manipulation.

   Example: A person might first buy all options on ACC and then try to manipulate the price of ACC to make it go up.

   This is, in principle, possible for the index also. However, the index is a large, well-diversified portfolio, and manipulation of the index is much harder, and requires much larger resources. The market capitalisation of the NSE-50 index today is around ₹ 200,000 crore. It is more difficult to manipulate it today as compared with any individual security in the country.

2. ***Index derivatives go along with interesting investment strategies:*** Index funds have now started appearing in India; internationally, it is common to see 30-40% of all professionally managed funds being in index funds. Index futures are an invaluable tool for running index funds: when index futures markets exist, it becomes easier to run index funds, which yield returns that are highly close to the returns of the actual index.

   Similarly, index options are useful for interesting new products like "guaranteed return funds'' (e.g. an index fund bundled with portfolio insurance in the form of a put option on the index) or "equity-linked bonds'' (e.g. an instrument which is 95% invested in a straight bond, while 5% is invested in a call option which sharply benefits from the upside potential of the market index).

3. ***Index derivatives support index forecasting:*** Today, a good deal of trading volume on the market is composed of people who are taking a view on the index – this is implemented using portfolios of two or three stocks. E.g. portfolios of Reliance, TISCO and SBI are often used to be a proxy for the index. Index derivatives will directly give people a mechanism through which a view on the index can be implemented on the market. This will be a spur for research and analysis devoted to understanding and anticipating movements of the market index.

4. ***Index derivatives are cash settled:*** Index derivatives are cash – settled, which means that no delivery of securities is made. In an environment where the depository has not yet come to dominate all settlement, this is a considerable advantage over any transactions involving securities.

Notes

5.5.2 Contract Specification for Index Options

On NSE's index options market; there are one-month, two-month and three-month expiry contracts with minimum nine different strikes available for trading. Hence, if there are three serial month contracts available and the scheme of strikes is 6-1-6, then there are minimum $3 \times 13 \times 2$ (call and put options) i.e. 78 options contracts available on an index. Option contracts are specified as follows: DATE-EXPIRYMONTH-YEAR-CALL/PUT-AMERICAN/ EUROPEAN- STRIKE. For example the European style call option contract on the Nifty index with a strike price of 5000 expiring on the 26th November 2009 is specified as '26NOV2009 5000 CE'. Just as in the case of futures contracts, each option product (for instance, the 26 NOV 2009 5000 CE) has its own order book and its own prices. All index options contracts are cash settled and expire on the last Thursday of the month. The clearing corporation does the novation. The minimum tick for an index options contract is 0.05 paise.

5.5.3 Contract Specifications for Stock Futures

Trading in stock futures commenced on the NSE from November 2001. These contracts are cash settled on a T+1 basis. The expiration cycle for stock futures is the same as for index futures, index options and stock options. A new contract is introduced on the trading day following the expiry of the near month contract.

Self Assessment

Fill in the blanks:

17. ……are derivative contracts which derive their value from an underlying index.
18. Index derivatives are ……settled.
19. The index is a large, well-diversified portfolio, and …….of the index is much harder, and requires much larger resources.
20. Index derivatives are cash-settled, which means that ……of securities is made.

Case Study

Real Estate Option Strategy

Let's use a land option example where Ramesh know of a farm that has a current value of ₹ 100,000, but there is a chance of it increasing drastically within the next year because he know that a hotel chain is thinking of buying the property for ₹ 200,000 to build a huge hotel there. So, he approaches the owner of the land, a farmer, and tells him that Ramesh want the option to buy the land from him within the next year for ₹ 120,000 and Ramesh pay him ₹ 5,000 for this right or option. The ₹ 5,000 or premium, he give to the owner is his compensation for giving up the right to sell the property over the next year to someone else and requiring him to sell it to Ramesh for ₹ 120,000 if he chooses so. A couple of months later the hotel chain approaches the farmer and tell him they will buy the property for ₹ 200,000. Unfortunately, for the farmer he must inform them that he cannot sell it to them because he has sold the option to Ramesh. The hotel chain then approaches Ramesh and says that they want him to sell them the land for ₹ 200,000. Since, Ramesh now have the rights to the property's sale, Ramesh now have two choices to make money. In the first choice he can exercise option and buy the property for ₹ 120,000 from the farmer and turn around and sell it to the hotel chain for ₹ 200,000 for a profit of ₹ 75,000.

Contd....

Notes

₹ 200,000 from the hotel chain

—₹ 120,000 to the farmer

—₹ 5,000 for the price of the option

₹ 75,000

Unfortunately, Ramesh do not have ₹ 120,000 to buy the property so Ramesh is left with the second choice.

The second choice allows Ramesh to just sell the option directly to the hotel chain for a handsome profit and then they can exercise the option and buy the land from the farmer. If the option allows the holder to buy the property for ₹ 120,000 and the property is now worth ₹ 200,000 then the option must be worth at least ₹ 80,000, which is exactly what the hotel chain is willing to pay Ramesh for it. In this scenario Ramesh will still make ₹ 75,000.

₹ 80,000 from the hotel chain

—₹ 5,000 paid for the option

₹ 75,000 profit

In this example everyone is happy. The farmer got ₹ 20,000 more than he thought the land was worth plus ₹ 5,000 for the option netting him a ₹ 25,000 profit. The hotel chain gets the property for the price they were willing to pay and can now build a new hotel. Ramesh made ₹ 75,000 on a limited risk investment of ₹ 5,000 because of his insight. This is the same choice Ramesh will be making in the commodity and futures options markets he trade. He will typically not exercise option and buy the underlying commodity because then he will have to come up with the money for the margin on the futures position just as he would have had to come up with the ₹ 120,000 to buy the property. Instead he would sell the option in the market for profit. Had the hotel chain decided not to buy the property then he would have had to let the option expire and would have lost the ₹ 5,000.

Now, let's pretend the hotel chain knows that the land on which the hotel will be built is only zoned for farming use and that the local government may not allow them to have it rezoned for commercial property use. If it is not rezoned for hotel use the value will drastically reduce since it can only be used as a farm again. This would drop it back to its original value of ₹ 100,000 before all of these deals had happened. In order to protect themselves and profit from the possible misfortune of this scenario the hotel chain approaches a real estate investor and tells him they would like to buy a Put option from them for ₹ 5,000. With this Put option the investor promises to allow the hotel chain to "put" or sell the property to them for ₹ 150,000. As far as the investor knows the property is worth ₹ 200,000 right now, so he is willing to receive ₹ 5,000 for this option's possible obligation to buy the property for ₹ 150,000 if the hotel so chooses to do so in the next 6 months before the option expires. A couple of months later the hotel chain finds out that the local government will not allow the property to be rezoned, so they can no longer build the hotel there. Therefore, they tell the investor they want to exercise their right to sell him the property for ₹ 150,000. The investor is forced to pay ₹ 150,000 to the hotel chain to own the property which means it cost him ₹ 145,000 because he received ₹ 5,000 a couple of months ago for the option he sold. The hotel chain then limits their losses by selling a property for ₹ 150,000 that was only worth ₹ 100,000 now that it can only be used as a farm. By buying the option for ₹ 5,000, they were able to make ₹ 45,000 they would not have been otherwise able to make.

₹ 150,000 from investor

—₹ 5,000 cost of option

Contd....

Notes

– ₹ 100,000 true value of property

₹ 45,000 profit from Put option

Had the government allowed them to build the hotel they would have let the option expire worthless and lost ₹ 5,000 for the cost of the option. This is how money can be made with Put options when an underlying asset falls in price.

Questions:

1. Analyse the case and find out the factors that affect the value of an option (premium) of land?
2. Why it is not possible to exercise the option and buy the underlying commodity?

Source: www.apexfutures.com/trading-tools/options/what-are-puts/

5.6 Summary

- An option is a contract that gives the buyer the right, but not the obligation, to buy or sell an underlying asset at a specific price on or before a certain date.
- An option, just like a stock or bond, is a security. There are two basic types of options – call options and put options.
- There are three main categories of options: European, American and Bermudan.
- There are four types of participants in options markets namely, Buyers of calls, Sellers of calls, Buyers of puts and Sellers of puts.
- The Options Clearing Corporation is the sole issuer of all options listed at the Chicago Board of Options Exchange (CBOE) and other U.S. options exchanges.
- In India, NSE has an associated clearing house attached to it for futures and options trading. Some of the important terms used in option trading are: Option Class, Option price, Strike Price, Expiration date and others.
- There are three positions in an option – In-the-money; At-the-money; and Out-of-the-money.
- The option premium can be broken down into two components – intrinsic value and time value.
- Index derivatives are derivative contracts which derive their value from an underlying index. The two most popular index derivatives are index futures and index options.
- Index derivatives are a powerful tool for risk management for anyone who has portfolios composed of positions in equity.

5.7 Keywords

American Options: American options are options that can be exercised at any time up to the expiration date. Most exchange-traded options are American.

At-the-money option: An at-the-money (ATM) option is an option that would lead to zero cash flow if it were exercised immediately.

Call option: A call option gives the holder the right but not the obligation to buy an asset by a certain date for a certain price.

Notes

European options: European options are options that can be exercised only on the expiration date itself.

Expiration date: The date specified in the options contract is known as the expiration date, the exercise date, the strike date or the maturity.

Index derivatives: Index derivatives are derivative contracts which derive their value from an underlying index.

Option Premium: The "price" an option buyer pays and an option writer receives is known as the premium.

Option: An option is a contract that gives the buyer the right, but not the obligation, to buy or sell an underlying asset at a specific price on or before a certain date.

Put option: A put option gives the holder the right but not the obligation to sell an asset by a certain date for a certain price.

5.8 Review Questions

1. What do you mean by options and option market? Discuss with suitable examples.
2. Discuss in detail the historical background and uses of option market.
3. Discuss the difference between futures and option contract with suitable examples.
4. Write a detailed note on the important terms and trading mechanism of option market.
5. Distinguish between American Options and European Options.
6. List and explain the role of market players in option trading.
7. "Options contracts are relatively more safe derivative instruments". Explain this statement.
8. Illustrate 'in-the-money' and 'out-of-the-money' positions in both call option and put option.
9. Write short notes on:
   (a) Option premium
   (b) Vanilla Options
   (c) Real Options
10. What do you understand by option value? Discuss the concept of time value and intrinsic value.

Answers: Self Assessment

1.	Calls, puts	2.	European, American
3.	Index, stock	4.	Option price
5.	American	6.	European
7.	Time value	8.	Strike price
9.	False	10.	False
11.	True	12.	True
13.	True	14.	False

Notes

15. True
16. True
17. Index derivatives
18. Cash
19. Manipulation
20. No delivery

5.9 Further Readings

Books

Chance, Don M. *An Introduction to Derivatives*. Dryden Press, International Edition

Chew, Lilian: *Managing Derivative Risk*. John Wiley. New Jersey.

Das, Satyajit. *Swap & Derivative Financing*. Probus.

Derivatives Market NCFM Module, NSE India Publications

Online links

http://faculty.washington.edu/ezivot/econ422/Options%20EZ.pdf

http://srikant.org/thesis/node6.html

www.nse.org

http://www.nseindia.com/content/ncfm/ncfm_modules.htm

Notes

Unit 6: Valuation and Pricing of Options

CONTENTS

Objectives
Introduction
6.1 Valuation of Options
6.1.1 Basic Principles of Option Valuation
6.1.2 Put-Call Parity
6.2 Option Pricing
6.2.1 Primary Option Pricing Factors
6.3 Options Pricing Models
6.3.1 Binomial Options Pricing Model (BOPM)
6.3.2 Single Period Binomial Model
6.3.3 Binomial Option Pricing Model (BOPM) for PUTS
6.4 Black-Scholes Model for Call Options
6.4.1 Assumptions Underlying Black-Scholes Model
6.4.2 Black-Scholes European Model
6.4.3 Black-Scholes American Model
6.5 Summary
6.6 Keywords
6.7 Review Questions
6.8 Further Readings

Objectives

After studying this unit, you should be able to:

- Discuss the valuation of options and some basic principles;
- Explain the pricing of option;
- List the primary option pricing factors;
- Describe the options pricing models;
- Explain the Binomial options Pricing Model (BOPM) and Black-Scholes model for Call Options.

Introduction

In the previous unit, we studied about the concept and features of options contracts. We also discussed about the key terms used in options, basic types of options, distinction between futures and options and concept of index derivatives. This unit will helps you to understand the basic principles and concept of valuation of options. We will also learn the pricing of option. The various sections and sub section of this unit will also summarise the primary option pricing factors, options pricing models including Binomial options Pricing Model (BOPM) and Black-Scholes model for Call Options.

Notes

Modern option pricing techniques are often considered among the most mathematically complex of all applied areas of finance. Financial analysts have reached the point where they are able to calculate, with alarming accuracy, the value of a stock option. Most of the models and techniques employed by today's analysts are rooted in a model developed by Fischer Black and Myron Scholes in 1973.

The price of an option contract is that amount which is paid by the option buyer to the option seller. This is otherwise, known as option premium. Like, other price mechanism the premium (option price) on a particular option contract is computed by the demand and supply of the underlying asset (option). There are two types of option price i.e., intrinsic value and time value. The intrinsic value of a call option is that amount by which stock price exceeds the strike price, whenever the option is in-the-money. This intrinsic value will be zero when the stock price is less than the option strike price. On the other hand, the intrinsic value of put option is that amount by which strike price exceeds the stock price, whenever the option is in-the-money. This intrinsic value of put option will be zero when the strike price is less than the stock price. Time value of an option is the excess of option price over the intrinsic value.

Options trading have been done for many centuries by traders using their instincts to guide the choice of prices. At the dawn of modern financial economics, researchers faced the challenge of finding a scientific theory which would yield an explicit solution to the question of how options can be priced. The identity of the underlying asset impinges upon option pricing via the volatility of returns on the asset. Options on more volatile assets are more valuable e.g. the insurance premium would be higher if there was more uncertainty about an outcome. When the volatility of an asset goes up, options on that asset become more valuable. To understand better the significance and option pricing techniques, we discuss the two important models of option valuation like Black-Scholes model and the Binomial model.

6.1 Valuation of Options

In order to understand how options work in practice it is necessary to go back to the most fundamental financial dynamic: the balance between expected return and risk. The problem for all investors is that it is only possible to receive a higher expected return if one also is prepared to take on more risk. But what is acceptable risk – and how should it be managed?

For a financial player the risk is that one a position never guarantees a return. This uncertainty about the future value of an asset is a central issue within all investment decisions. A measure of an asset's risk in this context is price movements or volatility, which refers to the average deviation from the asset's historical average value change. In other words, the risk of a stock is dependent on how much and how fast the price moves on the exchange. The problem is that risk is not entirely uniform. A stock portfolio is usually connected to three different types of risks; company risk, industry risk and market risk. The company and industry specific risks – basically all those factors that can affect the unique company or its whole industry negatively – can be eliminated through diversification, achieved mainly by including stocks from several companies from different industries in the portfolio. The third risk, the market risk, is common for all assets on the market and cannot be diversified away.

For options the situation is different, since options do not imply the purchasing of assets. Instead, one invests in the opportunity to share the future price change of a stock. Thereby completely new rules are introduced in comparison with trading stocks only – rules that for an outsider just may seem risky and complicated, but which the initiated find as logical as any other mathematical dynamics.

The value of an option is determined by its chance to be exercised with profit on the expiry day. This consists of two parts: the real value and the time value. The real value is the value that is possible to 'touch'. A call option has a real value if the underlying stock's price exceeds the

Notes

option's strike price. For put options it is the other way around, in that they have real value if the strike price instead exceeds the value of the stock. Conversely the time value is the value of the possibility that good news will occur during the time to maturity in order for an option to have a real value on the expiry day. Time value changes during the maturity period and will always be zero on the expiry day. Options that have a real value are said to be 'in the money' and are called plus options by professionals, while options that completely miss real value are 'out-of-the-money' and are referred to as minus options. Options where the strike price and stock price corresponds are 'at-the-money' and are called "pari" options.

The value of the option can be estimated with a mathematical formula named Black & Scholes after its inventors. In the formula the price is calculated as a function of the underlying stock value, the strike price, the time to maturity and the level of the risk free interest rate, among others. All terms in the equation can be determined relatively easy except one: the stock's volatility. The risk measure that is interesting when one deal with options is the so called 'implied volatility', which contains the premium that the market has set on the option. Contrary to historical volatility, implied volatility measures the market's expectations on the future changes in the stock price. This is crucial, as it is when an investor has a different opinion to the general market about the future risk of a stock that it becomes possible to enter and make money from an option, since its premium then will be different than what it 'should' be.

There are a large number of strategies that one can use in order to profit from the possibilities of options. Learning the differences and advantages between different options is critical to success, as options can appear superficially similar. It is seldom enough just to look at the option's premium and the strike price. Real professionals also look at how sensitive the options are for the market climate.

Did u know? By using Black & Scholes' formula one can derive several important sensitivity measures – commonly mentioned as 'the Greeks' since they have been provided with Greek letters – that can clearly tell how an option will react from different market conditions.

6.1.1 Basic Principles of Option Valuation

The two basic principles/rules of option valuation are as follows:

1. If one portfolio of securities gives a higher future payoff than another portfolio in every possible circumstance, then the first portfolio must have a higher current value than the second portfolio.
2. If two portfolios of securities give the same future payoff in every possible circumstance, then they must have the same current value.

If (1) and (2) did not hold, then it would be possible for a professional trader to make an arbitrage profit by simultaneously selling the relatively overpriced portfolio and buying the relatively under priced portfolio. We will use these rules to construct positions that offer the identical payoff as the option. If we can price the position with the same payoff as the option, then we have the price of the option.

Notes Another point to note is that the modern valuation of exchange-traded options ignores margin requirements, transactions costs, and taxes because it focuses on market pricing relations that are enforced by the arbitrage activities of professional traders. The margin requirements and transactions costs of these traders are very low. Furthermore, taxes usually reduce the level of arbitrage profits but do not change the circumstances in which they occur.

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A major advance in option pricing was accomplished by Hans Stoll in 1969, when he used the no arbitrage argument to link up the price of a call option and a put option. This principle is called put-call parity. Let us understand the put-call parity in details.

6.1.2 Put-Call Parity

Put-call is nothing but a relationship that must exist between the prices of European put and call options having same underlying assets, strike price and expiration date. That relationship is derived by the help of arbitrage arguments. Put-call parity is a classic application of arbitrage-based pricing – it does not instruct us on how to price either put or call options, but it gives us an iron law linking the two prices. Hence, if call options can be somehow priced, then the price of the put option is immediately known.

Since put-call parity is a canonical arbitrage argument, we will spell it out in detail here.

Suppose a person has one share of Reliance and buys a put option at ₹ 300 which can be exercised T years in the future. In this case, the person faces no future downside risk below ₹ 300, since the put option gives him the right to sell Reliance at ₹ 300. Suppose, in addition, the person sells a call option on Reliance at ₹ 300. In this case, if the price goes above ₹ 300, the call holder will exercise the call option and take away the share at ₹ 300. The sale of the call eliminates upside risk above ₹ 300.

Hence, the following portfolio {one share, plus a put option at ₹ 300, minus a call option at ₹ 300} risklessly obtains ₹ 300 on date T. This payoff is identical to a simple bond which yields ₹ 300 on date T.

Suppose the interest rate in the economy is r, then this bond has the present price $300/ (1 + r)^T$. This is a situation to which the law of one price applies: we have two portfolios which yield the identical payoff:

1. $300 / (1 + r)^T$ invested in a simple bond, which turns into ₹ 300 on date T for sure, and
2. A portfolio formed of S + P – C, which turns into ₹ 300 on date T for sure.

By the law of one price, if two portfolios yield the identical payoffs then they must cost the same. Hence we get the formula: $S + P - C = X/ (1 + r)^T$, where S is the spot price, P is the put price, C is the call price, X is the exercise price and T is the time to expiration.

If prices in any economy ever violate this formula, then risk less profits can be obtained by a suitable combination of puts, calls and shares. In summary, put-call parity links up the price of a call and the price of a put. If one is known, then we can infer the other.

The put-call parity states that the difference in price between a call-option and a put-option with the same terms should equal the price of the underlying asset less the present discounted value of the exercise price. A put and call option written on the same stock with the same exercise price and maturity date must sustain, if there are to be no risk less arbitrage opportunities. This condition is known as the 'put-call parity' (Kester and Backstrand, 1995). This relationship can be expressed as follows:

$$V_c - V_p = P_a - X$$

where,

V_c = the price of a call option,

V_p = the price of a put option,

P_a = the price of the underlying asset,

X = present discounted value of the exercise price.

Notes

Caution If call or put option prices deviated substantially then, transactions in them would drive prices up or down until the arbitrage is eliminated.

Below we discuss put-call parity under two different cases i.e., with no dividends and with dividends.

Put-Call Parity (no Dividends)

The price of a call and a put are linked via the put-call parity relationship. The idea here is that holding the stock and buying a put is going to deliver the exact same payoffs as buying one call and investing the present value of the exercise price. Let's demonstrate this. Consider the payoffs of two portfolios. Portfolio A contains the stock and a put. Portfolio B contains a call and an investment of the present value of the exercise price. The value of Portfolio A on expiration date is shown in Table 6.1 and that of Portfolio B is shown in Table 6.2.

Table 6.1: Portfolio A

	Value on the Expiration Date	
Action Today	$S^*<=k$	$S^*>k$
Buy one share	S^*	S^*
Buy one put	$k - S^*$	0
Total	**k**	**S^***

Table 6.2: Portfolio B

	Value on the Expiration Date	
Action Today	$S^*<=k$	$S^*>k$
Buy one call	0	S^*-k
Invest of PV of k	k	k
Total	**k**	**S^***

Put-Call Parity (with Dividends)

We can also use the put-call parity theory for a stock that pays dividends. The idea is very similar to the no dividend case. The value of the call will be exactly equal to the value of a portfolio that includes the stock, a put, and borrowing the present value of the dividend and the present value of the exercise price. Consider the payoffs of two portfolios. Portfolio A just contains the call option. Portfolio B contains the stock, a put and borrowing equal to the present value of the exercise price and the present value of the dividend.

The value of Portfolio A on expiration date is shown in Table 6.3 and that of Portfolio B is shown in Table 6.4.

Table 6.3: Portfolio A

	Value on the Expiration Date	
Action Today	$S^*<=k$	$S^*>k$
Buy one call	0	S^*-k
Total	**0**	**S^*-k**

Notes

Table 6.4: Portfolio B

	Value on the Expiration Date	
Action Today	$S^*<=k$	$S^*>k$
Buy one share	S^*	S^*
Buy one put	$k- S^*$	0
Borrow the PV of k and d	-k	-k
Total	**0**	**S^*-k**

Since the portfolios always have the same final value, they must have the same current value. Again, this is the rule of no arbitrage.

Notes Note that this arrangement of the portfolios is slightly different from the case with no dividends. In the no dividends case, we had the stock and a put in portfolio A. In the dividends case, we have just the call in portfolio A. But clearly, we could have constructed the no dividends case with just a call in the portfolio A – it would have no impact on the result.

Further note, that as the result of borrowing the present value of both the dividend and the exercise price we only payoff the exercise price. The reason for this is that if you get the dividend payment before expiration, then you use it to reduce your total debt. In fact, you use it to exactly pay off that part of the debt that is related to the dividend part of the borrowing.

We can express the put-call parity relation as:

$$c = S + p - PV(k) - PV(d)$$

where PV(k) is the present value of the exercise price and PV(d) is the present value of the dividend.

Before discussing the details of various option pricing models, we must understand the upper and lower limits of both call and put options. These are discussed below.

This put-call parity can be further explained by the help of suitable diagrams by comparing the expiration value of two portfolios i.e., (1) The call option and an amount of cash equal to the present value of the strike price; and (2) The put option and the underlying assets.

Self Assessment

Fill in the blanks:

1. Put-call is nothing but a relationship that must exist between the prices of ……..... put and call options having same underlying assets, strike price and expiration date.
2. Put-call parity is a classic application of …….....
3. The put-call parity states that the difference in price between a call-option and a put-option with the same terms should equal the price of the underlying asset less the present ……..... value of the exercise price.
4. If call or put option prices deviated substantially then, transactions in them would drive prices up or down until the ……..... is eliminated.
5. ……..... links up the price of a call and the price of a put.

Notes

6.2 Option Pricing

Modern option pricing techniques are often considered among the most mathematically complex of all applied areas of finance. Financial analysts have reached the point where they are able to calculate, with alarming accuracy, the value of a stock option. Most of the models and techniques employed by today's analysts are rooted in a model developed by Fischer Black and Myron Scholes in 1973.

The price of an option contract is that amount which is paid by the option buyer to the option seller. This is otherwise, known as option premium. Like, other price mechanism the premium (option price) on a particular option contract is computed by the demand and supply of the underlying asset (option). There are two types of option price i.e., intrinsic value and time value. The intrinsic value of a call option is that amount by which stock price exceeds the strike price, whenever the option is in-the-money. This intrinsic value will be zero when the stock price is less than the option strike price. On the other hand, the intrinsic value of put option is that amount by which strike price exceeds the stock price, whenever the option is in-the-money. This intrinsic value of put option will be zero when the strike price is less than the stock price.

Did u know? Time value of an option is the excess of option price over the intrinsic value.

6.2.1 Primary Option Pricing Factors

Various factors affect the price of options on stocks. We shall look at the impact of changes in each of these factors on option prices one at a time, assuming that all other factors remain the same. For a given type and style of option contract, there are six primary factors affecting its price. They are:

1. ***Current Stock Price:*** The option price changes as per changing stock price. In case of a call option the payoff for the buyer is Max (S – Xt, 0) therefore, more the spot price, more is the payoff and it is favourable for the buyer.

   Example: For a call option the option price rises as the stock price increases and vice-versa. As the current stock price goes up, the higher is the probability that the call will be in the money. As a result, the call price will increase. The effect will be in the opposite direction for a put. As the stock price goes up, there is a lower probability that the put will be in the money. So the put price will decrease.

2. ***Exercise Price:*** In the case of a call, as the exercise price increases, the stock price has to make a larger upward move for the option to go in-the-money. Therefore, for a call option, as the exercise price increases, options become less valuable and as the strike price decreases they become more valuable. The higher the exercise price, the lower the probability that the call will be in the money. So for call options that have the same maturity, the call with the price that is closest (and greater than) the current price will have the highest value. The call prices will decrease as the exercise prices increase. For the put, the effect runs in the opposite direction. A higher exercise price means that there is higher probability that the put will be in the money. So the put price increases as the exercise price increases.

3. ***Volatility:*** The volatility of a stock price represents the uncertainty attached to its future movement. This measures the degree to which the price of the underlying instruments tends to fluctuate over time. Both the call and put option will increase in price as the underlying asset becomes more volatile. As volatility increases, the likelihood that the stock will do very well or very poorly increases. The value of both calls and puts therefore

Notes

increase as volatility increases. The buyer of the option receives full benefit of favourable outcomes but avoids the unfavourable ones (option price value has zero value).

4. ***Risk free Interest Rates:*** The risk-free interest rate is the interest rate that may be obtained in the marketplace with virtually no risk. The affect of the risk-free interest rate is less clear-cut. It is found that put option prices decline as the risk-free rate increases whereas the prices of calls always increase as the risk-free interest rate increases. The higher the interest rate, the lower the present value of the exercise price. As a result, the value of the call will increase. The opposite is true for puts. The decrease in the present value of the exercise price will adversely affect the price of the put option. All other factors remaining constant, the higher the interest rate the greater the cost of buying the underlying asset and carrying it to the expiration date of the call option. Hence, the higher the short risk free interest rate, the greater the price of a call option.

5. ***Cash Dividends:*** Dividends have the effect of reducing the stock price on the ex-dividend date. This has a negative effect on the value of call options and a positive effect on the value of put options. When dividends are announced then the stock prices on ex-dividend are reduced. This is favourable for the put option and unfavourable for the call option. On ex-dividend dates, the stock price will fall by the amount of the dividend. So, the higher the dividends, the lower the value of a call relative to the stock. This effect will work in the opposite direction for puts. As more dividends are paid out, the stock price will jump down on the ex-date which is exactly what you are looking for with a put.

6. ***Time to Expiration:*** Generally, both calls and puts will benefit from increased time to expiration. The reason is that there is more time for a big move in the stock price. Consider the case of two options that differ only as far as their expiration date is concerned. The owner of the long-life option has all the exercise opportunities open to the owner of the short-life option and more. The long-life option must therefore always be worth at least as much as the short life option. As the time to expiration increases, the present value of the exercise price decreases. This will increase the value of the call and decrease the value of the put. Also, as the time to expiration increases, there is a greater amount of time for the stock price to be reduced by a cash dividend.

Notes This reduces the call value but increases the put value.

Let's summarise these effects in Table 6.5 as given below. The table shows all effects on the buyer side of the contract.

Table 6.5: Determinants of Option Value

S. No.	Factors	Effect of Increase on	
		Value of Call Option	Value of Put Option
1	Current Stock/Spot Price	Increase	Decrease
2	Exercise Price	Decrease	Increase
3	Volatility	Increase	Increase
4	Risk-free Interest Rate	Increase	Decrease
5	Dividends	Decrease	Increase
6	Time to Expiration	Increase	Increase

Notes

Notes Basic principles of Option valuation.

The two basic principles/rules of option valuation are as follows:

1. If one portfolio of securities gives a higher future payoff than another portfolio in every possible circumstance, then the first portfolio must have a higher current value than the second portfolio.
2. If two portfolios of securities give the same future payoff in every possible circumstance, then they must have the same current value.

Self Assessment

Fill in the blanks:

6. The …… of an option contract is that amount which is paid by the option buyer to the option seller.
7. The option price is also known as ……
8. The option price changes as per changing …… price.
9. The …… interest rate is the interest rate that may be obtained in the marketplace with virtually no risk.
10. The higher the interest rate, the lower the …… of the exercise price.

6.3 Options Pricing Models

Option pricing theory also called Black-Scholes theory or derivatives pricing theory – traces its roots to Bachelier (1900) who invented Brownian motion to model options on French government bonds. This work anticipated Einstein's independent use of the Brownian motion in physics by five years.

The following are the key option pricing models:

6.3.1 Binomial Options Pricing Model (BOPM)

In finance, the binomial options pricing model provides a generalisable numerical method for the valuation of options. The binomial model was first proposed by Cox, Ross and Rubinstein (1979). This model is an important technique of pricing a stock option by constructing a binomial tree. The binomial tree represents different possible paths that may be followed by the stock price over the life of the option. At the end of the tree i.e., at the expiration of the option, the final possible stock prices are simply equal to their intrinsic values. This model will consider the time to expiry of an option as being one-period, two-periods and multiple periods.

The Binomial model is used by the help of probabilities of a stock moving up or down, the risk-free rate and the time interval of each step (in the binomial tree) till expiry. By use of these probabilities, a binomial tree is to be constructed and evaluated to finally find the price of a call option.

Essentially, the model uses a "discrete-time" model of the varying price over time of the underlying financial instrument. Option valuation is then via application of the risk neutrality assumption over the life of the option, as the price of the underlying instrument evolves.

Notes

Assumptions

1. The current selling price of the stock (S) can only take two possible values i.e., an upper value (S_u) and a lower value (S_d).
2. We are operating in a perfect and competitive market, i.e.
   (a) There are no transaction costs, taxes or margin requirements.
   (b) The investors can lend or borrow at the riskless rate of interest, r, which is the only interest rate prevailing.
   (c) The securities are tradable in fractions, i.e. they are divisible infinitely.
   (d) The interest rate (r) and the upswings/downswings in the stock prices are predictable.
3. The value of (1+r) is greater than d, but smaller than u i.e., u<1+r<d. This condition or assumption ensures that there is no arbitrage opportunity.
4. The investors are prone to wealth maximisation and lose no time in exploiting the arbitrage opportunities.

6.3.2 Single Period Binomial Model

The single period binomial model is also known as a one-step binomial model. We shall assume a unit period of option's life, while BOPM can be used for deriving the value of multi-period options also. 'Unit period' of option's life is implied that the option's stock price will move either up or down by the date of expiration of the option. On the other hand, in the multi-period model, the stock price may move many times between a given date and the expiration date of the option. Logically the unit period case is unrealistic and the multi-period case is more likely to happen in real situation.

Caution However, for the purpose of simplicity and understanding, we shall restrict ourselves to the Unit (single) period model.

Although BOMP can be used for dividend paying stocks, however, again for simplicity we shall be assuming non-dividend stocks.

Use of the Model

The Binomial options pricing model approach is widely used as it is able to handle a variety of conditions for which other models cannot easily be applied. This is largely because the BOPM models the underlying instrument over time — as opposed to at a particular point. For example, the model is used to value American options which can be exercised at any point and Bermudan options which can be exercised at various points. The model is also relatively simple, mathematical, and can therefore be readily implemented in a software (or even spreadsheet) environment.

Although slower than the Black-Scholes model (to be discussed later in this chapter), it is considered more accurate, particularly for longer-dated options, and options on securities with dividend payments. For these reasons, various versions of the binomial model are widely used by practitioners in the options markets.

For options with several sources of uncertainty (e.g. real options), or for options with complicated features (e.g. Asian options), lattice methods face several difficulties and are not practical.

Notes

Did u know? Monte Carlo option models are generally used in these cases. Monte Carlo simulation is, however, time-consuming in terms of computation.

The notations which we shall use in the derivation are as follows:

t- Option's expiration date.

t-1 - A unit period prior to the expiration date.

S - Stock price at time t-1.

u - Probable upswing in the rate of return on underlying asset expressed in percentage.

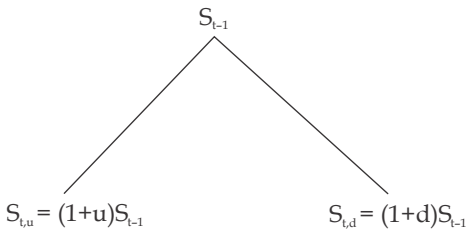
d - Probable downswing in the rate of return on underlying asset, expressed in percentage.

$S_{t,u}$ - Stock price at time t, if there is an upswing u.

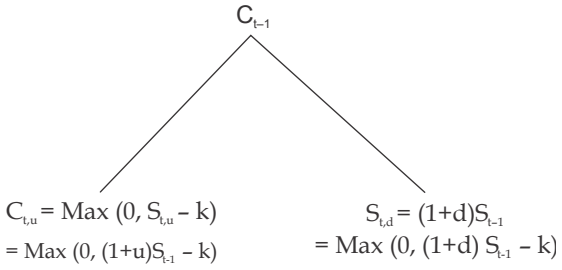
$S_{t,d}$ - Stock price at time t, if there is a downswing d.

k - Exercise price of the option.

In the unit period which we have presumed, the stock with a spot price of St-1, has just sufficient time to move either up or down as indicated below:



Similarly, a call option on the above stock with value C_{t-1} , would either move up or down and can be represented as follows:



In the case of an upswing of 'u' at time t , $S_{t,u} = (1+u)S_{t-1}$

Similarly, in case of a downswing of 'd' at time t , St,d = (1+d) St–1

Let us take an example,

Consider a European Call Option. There is one month left for its expiration (unit period). The current stock price, St-1 is ₹ 50. On the expiry of the unit period, the stock may either sell for ₹ 65 (say) i.e. St,u = ₹ 65 or for ₹ 40 (say) i.e. St,d = ₹ 40.

Based on this data, we compute the value of u and d as follows:

S = (1+u)S, or 65 = (1+u)50; Therefore, u = 0.30

Similarly,

S = (1+d)S; or 40 = (1+d)50; Therefore, d = (–) 0.20

Notes

Here u has to be greater than the riskless rate of return available in the market (denoted by 'r') to induce the investor to take risk and invest. However, in case u and d are both greater than r, the investors would have an opportunity to arbitrage. The investors would borrow heavily and invest in the stocks. As we have assumed a perfect market, no arbitrage opportunities could exist. As such, it is imperative that: $u > r > d$

Similarly, we cannot have a situation where the risk less rate of return is greater than the returns on risky securities, i.e. we cannot have: $r > u > d$

The reason is obvious. Under no circumstances, an investor would invest in a riskier security if he is getting higher return in a risk less security.

Now coming back to our model, if the price of the underlying stock rises, the price of the call option (with exercise price k) would be:

$$Ct,u = Max\ (0, St,u - k)$$

In the event of the stock price declining,

$$Ct,d = Max\ (0, St,d - k)$$

In other words,

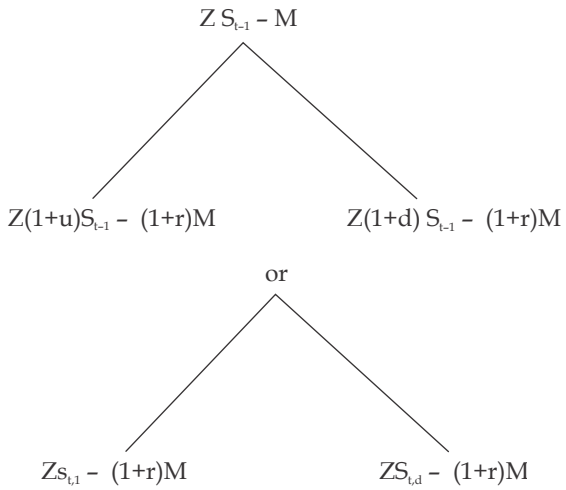
$$Ct,u = Max\ [0, (1+u)St-1 - k];\ \text{and}$$

$$Ct,d = Max\ [0, (1+d)St-1 - k]$$

Now, let us build a portfolio comprising equity and debt, which would exactly replicate the payoff to the call option over a unit period, i.e. exactly equate the value of the call option.

Consider a portfolio comprising purchase of Z number of shares of the optioned stock which is financed by borrowing 'M' at time t-1 at a risk less rate of interest of 'r'. Algebraically, this portfolio would be represented as 'Z S – M'.

We are assuming that the investment of (Z S – M) over a unit period can have only two probable situations, viz.



Let us now equate the values of the call at time t and the worth of the portfolio in the same time (which in our case is unit)

$$C_{t,u} = Z(1+u)\ S_{t-1} - (1+r)M$$

$$C_{t,d} = Z(1+d)\ S_{t-1} - (1+r)M$$

Notes

The solution of these two linear equations yields the value of Z and M as follows:

$$Z = \frac{C_{t,u} - C_{t,d}}{(u-d)\,S_{t-1}} \text{ or } \frac{C_{t,u} - C_{t,d}}{S_{t,u} - S_{t,d}}$$

More generally,

$$Z = \frac{C_u - C_u}{S_u - S_d} \qquad ...(6.1)$$

or more generally,

$$\text{and } M = \frac{(1+d)C_{t,u} - (1+u)C_{t,d}}{(u-d)\,(1+r)} \qquad ... (6.2)$$

The values of Z and M indicate respectively the number of shares to be bought and amount of money to be borrowed at a riskless rate in order to perfectly replicate a call option.

Any difference in the price of the call and the levered portfolio would induce arbitrage opportunities. Since we are operating in a perfect market, the arbitrage of opportunities will phase out as the market forces come into play.

After having got the values of Z & M, let us get back to our basic portfolio structure.

i.e. ZS – M

Now as per the presumption, the value of this portfolio has to be equal to the value of the call, i.e.

$$C_{t-1} = Z\,S_{t-1} - M$$

If we substitute the values of Z & M in this, we get

$$C = \frac{XS + (1-X)S}{(1+r)} \qquad ...(6.3)$$

Where $x = \frac{r-d}{u-d}$ and $1 - X = \frac{u-r}{u-d}$

This is the Binomial Option Pricing Model (BOPM) equation for unit period non-dividend paying stock's call option. However, dividend paying stock's call option value can be computed through BOPM with suitable modifications.

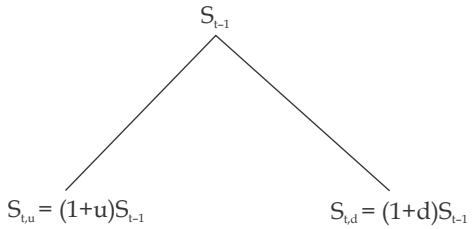
Similarly, call option formulae could be developed for options having two or more periods remaining before expiration.

As stated in the beginning, BOPM is the most flexible of option pricing models. All European and American put and call options can be valued through it, irrespective of whether with or without dividends. It can be used for single or multiple period options. The only handicap, which this model suffers from, is that when the option life is subdivided into multiple trading intervals, it becomes a complex and tedious mathematical exercise.

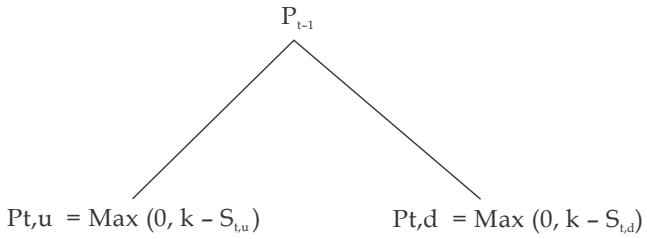
Notes

6.3.3 Binomial Option Pricing Model (BOPM) for PUTS

The derivation of a unit period BOPM for put options is analogical to that for the call options. Using the same assumptions and notations as those for calls, we consider the following pricing process for the put option's underlying stock:



Correspondingly, the put option values would be represented as under:

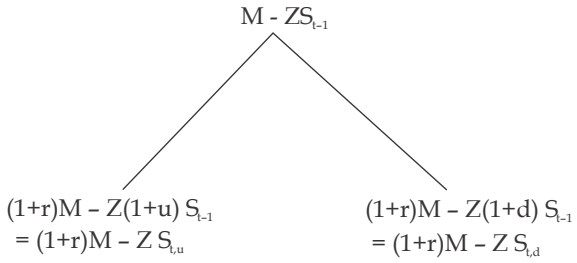


Now let us create a portfolio comprising debt and equity which would give the same pay off in unit time as the put option. For this purpose, we go short in Z number of shares of the underlying stock and lend ' M for unit period against risk less security at a rate of interest of r percent per unit period.

Algebraically, this would be represented as follows:

$$-ZS + M \quad \text{or} \quad M - ZS$$

Applying the same pricing pattern to the equivalent portfolio at the end of the unit period, the following process would emerge:



Equating the end of the unit period pays off from the portfolio with that from the put option:

$M(1+r) - Z(1+u)\ S_{t-1} = P_{t,u}$

$M(1+r) - Z(1+d)\ S_{t-1} = P_{t,d}$

Solving the above two equations for the values of M and Z, we get

$$Z = \frac{P_u - P_d}{(d-u)\ S_{r-1}} = \frac{P_u - P_d}{S_d - S_u} \qquad ...(6.4)$$

$$M = \frac{(1+d)\ P_u - (1+u)\ P_d}{(d-u)\ (1+r)} \qquad ...(6.5)$$

Notes

Thus, we get the debt and equity components of the portfolio that exactly replicates the put over a time t. The price of the put at time t–1, i.e. at the beginning of the unit period must equal the algebraic net of the portfolio:

P = M – ZS

Substituting the values of M and Z in the above equation, we get

$$P = \frac{XP + (1\text{-}X)\,P}{(1+r)} \qquad ...(6.6)$$

where

$$X = \frac{r-d}{u-d} \quad \text{and} \quad (1\text{-}X) = \frac{u\text{-}r}{u\text{-}d}$$

More generally, we may rewrite the formula as under

$$P = \frac{XP + (1\text{-}X)\,P}{(1+r)} \qquad ...(6.7)$$

Illustration: Let us consider the valuation of a call one period prior to expiration. A stock is currently selling at ₹ 50 and that after one period it would be selling either for ₹ 40 or ₹ 60. The rate of interest, both for borrowing and lending, is assumed to be 25% for the one period. Determine the value of the call with an exercise price of ₹ 50.

Solution: Consider a portfolio consisting of (i) writing two calls; (ii) buying one share of the stock; and (iii) borrowing ₹ 32.

Cash flows at the beginning and at the end of the period, t = 1, is shown in Table 6.6.

Table 6.6: Valuation of Call

Portfolio	**Flows at the beginning, t = 0**		**Flows at t = 1**
		S_1 = 40	***S_1 = 60***
Write 2 Calls	+ 2C	0	– 20
Buy a Share	–50	+40	+ 60
Borrow	+32	-40	-40
Total	**2C - 18**	**0**	**0**

The cash flows at the end of the period, t = 1, will be zero. It may be noted that if the stock price at t = 1 is ₹ 40, the calls will not be exercised, while if it is at ₹ 60, then a loss of ₹ 20 [=(60 – 50) ₹ 2] would be incurred on the calls. In either case, the loan of ₹ 32 will be repaid together with an interest of ₹ 8 (= 25% of the amount borrowed). This implies that in either case, the investor receives nothing and, therefore, the value of the calls would be such that the portfolio has a value of zero.

Accordingly, we set 2C – 50 + 32 = 0 , or 2C – 18=0 to get C = ₹ 9, where C is the price of the call.

It may be shown that if the call is selling at price higher or lower than ₹ 9, then it is possible to make a profit. For instance, suppose that the call is underpriced and is selling for ₹ 7. It is prudent, in such a case, to buy the call, shorting the stock and lending. As shown earlier, cash flow at t = 1 will be zero in either case but at t = 0, the flows are:

Notes

	Cash Flow
Buy two calls	- 14
Short one share	+ 50
Lend	- 32
Total	**+ 4**

It can similarly be shown that if the call is valued at a price greater than ₹ 9, then profit can be earned by creating a portfolio consisting of writing two calls, buying a share and borrowing ₹ 32.

To conclude, then, the call cannot sell for higher or lower than the value derived earlier. Call Option Value= ₹ 9.

Caselet

Use of Long Put Option

Situation: A farmer wants protection in case soybean prices fall by harvest

Strategy: Farmer buys an exchange-traded put option

If falling commodity prices are a risk to your profitability, buying put options will help you to establish a minimum selling price without giving up the opportunity to profit from higher prices. Assuming that you are a soybean producer and you have just finished planting your crop. You are worried that prices may fall before harvest and would like to establish a floor price for a portion of your expected soybean crop. You go ahead and purchase an October soybean put with a strike price of ₹ 1650— this gives you a minimum selling price of ₹ 1650 a quintal (excluding basis, commissions, and the cost of the option).

If, just before harvest, the October futures price declines to ₹ 1575 (your put option is in the money), you can exercise your option and receive a short futures contract at the ₹ 1650 strike price. Buying back the futures contract at the lower market price of ₹ 1575 gives you an ₹ 75 per quintal profit (the difference between the strike price and the futures price), which should roughly offset the decline in the price of soybeans. Or, rather than exercising the option, you might be able to earn more by selling back the option to someone else. This would allow you to profit from any remaining time value as well as the ₹ 75 intrinsic value, both of which would be reflected in the option premium.

When October soybean futures are trading at ₹ 1575, the ₹ 650 soybean put would be worth at least ₹ 75 plus any remaining time value. Generally, when an option is in the money and has time value its common for someone sell back the option rather than exercising it. That's because exercising the option will yield only its intrinsic value. Anytime, value that remains will be forgone. If the price of soybeans increases just before option expiration and is above the option strike price (your put option is out of the money), you can simply let the option expire or sell it back prior to expiration to capture any remaining time value. In either case, your loss on the option position can be no larger than the premium paid, and you still will be able to sell your crop at the higher market price.

Source: http://agmarketing.extension.psu.edu/Commodity/PDFs/Future_options_eginners.pdf

6.4 Black-Scholes Model for Call Options

In the early 1970s, Fischer Black, Myron Scholes, and Robert Merton made a major breakthrough in the pricing of stock options by developing what has become known as the Black-Scholes

Notes

Model. The Black-Scholes model, often simply called Black-Scholes, is a model of the varying price over time of financial instruments, and in particular stock options. The Black-Scholes formula is a mathematical formula for the theoretical value of so-called European put and call stock options that may be derived from the assumptions of the model. The equation was derived by Fischer Black and Myron Scholes in their paper "The Pricing of Options and Corporate Liabilities" published in 1973.

The Black and Scholes Option Pricing Model didn't appear overnight, in fact, Fisher Black started out working to create a valuation model for stock warrants. This work involved calculating a derivative to measure how the discount rate of a warrant varies with time and stock price. They built on earlier research by Paul Samuelson and Robert C. Merton. The fundamental insight of Black and Scholes is that the call option is implicitly priced if the stock is traded. The use of the Black-Scholes model and formula is pervasive in financial markets.

The value of call option is calculated as follows:

$C = S_0 N(d_1) - E e^{-rt} N(d_2)$

C = Theoretical Call Premium

S = Current Stock Price

T = Time until option expiration

K = Option Striking Price

r = Risk-Free Interest Rate

N = Cumulative standard normal Distribution

e = exponential term (2.7183)

$$d_1 = \frac{I_n(S/K) + (r + \sigma^2/2)}{\sigma\sqrt{T}}$$

$$d_2 = \frac{I_n(S/K) + (r - \sigma^2/2)T}{\sigma\sqrt{T}} = d_1 - \sigma\sqrt{T}$$

C (S, T) = price of the European call option,

P (S, T) = price of the European put option,

s = the annualised standard deviation of underlying asset price.

The price of a put option may be computed from this by put-call parity and simplifies to

$$P(S, T) = Ke^{-rT}N(-d_2) - SN(-d_1).$$

6.4.1 Assumptions Underlying Black-Scholes Model

The key assumptions of the Black-Scholes model are:

1. The risk-free interest rate exists and is constant (over the life of the option), and the same for all maturity dates.
2. The short selling of securities with full use of proceeds is permitted.
3. There is no transactions cost and there are no taxes. All securities are perfectly divisible (e.g. it is possible to buy 1/100th of a share).
4. There is no risk less arbitrage opportunities; security trading is continuous.

Notes

5. The underlying security pays no dividends during the life of the option, the higher the yield of dividend, the lower the call premium as thus, and the market prices of the calls are not likely to be the same.
6. The volatility of the underlying instrument (may be the equity share or the index) is known and constant over the life of the option.
7. The distribution of the possible share prices (or index levels) at the end of a period of time is log normal or, in other words, a share's continuously compounded rate of return follows a normal distribution. Essentially, this means that the share in question has the same likelihood to double in value as it to halve with the added implication that the share prices cannot become negative.
8. The price of the underlying instrument follows a geometric Brownian motion in particular constant drift μ (expected gain) and volatility σ:
9. The market is an efficient on. This implies that as a rule, the people cannot predict the direction of the market or any individual stock.

6.4.2 Black-Scholes European Model

The original Black-Scholes option-pricing model was developed to value options primarily on equities. This model has a number of restrictive assumptions including the limitation that the underlying asset pays no dividends. The model has since been "modified" to value European options on dividend paying equities, as well as on bonds, foreign exchange, futures and commodities. This enhanced model is known as the Modified Black-Scholes European model. It prices European options or options that may only be exercised at expiration.

The Modified Black-Scholes European model makes the following assumptions:

1. The option may not be exercised prior to its expiration date.
2. The price changes of the underlying asset are lognormally distributed.
3. The risk-free interest rate is fixed over the life of the option.
4. Dividend payments are not discrete; rather, the underlying asset yields cash flows on a continuous basis.

6.4.3 Black-Scholes American Model

An American-style option is an option that may be exercised at any time during the life of the option. The Modified Black-Scholes American option-pricing model is the same as the Modified Black-Scholes European model except that it checks to see if the value returned is below the intrinsic value of the option. If this is the case, then the Modified Black-Scholes model returns the intrinsic value of the option.

Black-Scholes American = Max (Black-Scholes European, Intrinsic Value)

The Modified Black-Scholes American model makes the following additional assumptions:

1. The price the option may be exercised prior to its expiration date.
2. Changes of the underlying asset are lognormally distributed.
3. The risk-free interest rate is fixed over the life of the option.
4. Dividend payments are not discrete; rather, the underlying asset yields a continuous constant amount.

Notes

Illustration: Consider the situation where the stock price six months from the expiration of an option is $42, the exercise price of the option is $40, the risk free interest rate is 10% per annum and the volatility is 20% per annum. This means that,

Current price of the share, S0 = ₹ 42

Exercise price of the option, E = ₹ 40

Time period to expiration = 6 months. Thus, t = 0.5 years.

Standard deviation of the distribution of continuously compounded rates of return, s = 0.2

Continuously compounded risk-free interest rate, r = .10

$$d_1 = \frac{\text{Ln } (42/40) + (0.10 + 0.5 \times 0.2^2)(0.50)}{0.2\sqrt{0.50}} = 0.7693$$

$$d_2 = \frac{\text{Ln } (42/40) + (0.10 - 0.5 \times 0.2^2)(0.50)}{0.2\sqrt{0.50}} = 0.6278$$

And $Ke^{-rt} = 40e^{-}(0.1*0.5) = 38.049$

Hence, if the option is a European call, its value C is given by

C = 42N(0.7693) – 38.049N(-0.7693)

If the option is European Put, its value P is given by

P = 38.049N(–0.6278) – 42N(–0.7693)

Using the Polynomial approximation

N (0.7693)=0.7791 N (–0.7693)=0.2209

N (0.6278)=0.7349 N (–0.6278)=0.2651

So that,

C= 4.76 P= 0.81

The value of European call is ₹ 4.76 and the value of European put option is ₹ 0.81.

Task Consider a European call option on a stock when there are ex-dividend dates in two months and five months. The dividend on each ex-dividend date is expected to be $ 0.5. The current price is $ 40, the exercise price is $40, the stock price volatility is 30% per annum, the risk free rate of interest is 9% per annum, and the time to maturity is six months.

Self Assessment

State whether the following statements are true or false:

11. In finance, the binomial options pricing model provides a generalisable numerical method for the valuation of options.
12. The Black and Scholes Model were first proposed by Cox, Ross and Rubinstein (1979).
13. The fundamental insight of Black and Scholes is that the put option is implicitly priced if the stock is traded.

Notes

14. The Black-Scholes formula is a mathematical formula for the theoretical value of so-called European put and call stock options that may be derived from the assumptions of the model.

15. The binomial tree represents different possible paths that may be followed by the stock price over the life of the option.

Case Study

Protection Against Rising Raw Material Costs

If rising commodity prices is a risk to your profitability, buying call options will help you. It allows you to establish a maximum purchase price without giving up the opportunity to profit from falling prices. For example, suppose you're a refiner and you expect to buy soybean oil in next few months. You are worried that prices may rise.

You would like to establish a ceiling price for your purchase. So, you buy a May soy oil call with a ₹ 450 strike price. This gives you a maximum purchase price of ₹ 450 per 10 kg (excluding basis, commissions, and the cost of the option). If, in April, the May futures price increases to ₹ 490 your call option becomes in the money. Now you can exercise your option and receive a long futures contract at the ₹ 450 strike price.

Selling back the futures contract at the higher market price ₹ 490 per 10 kg gives you a profit of ₹ 40 per 10 kg, which should roughly offset the increase in the cost of soy oil. Or, rather than exercising the option, you might be able to earn an even larger profit by selling the option to someone else at a higher premium.

This would allow you to profit from any remaining time value as well as the increase in intrinsic value, both of which would be reflected in the option premium. The ₹ 450 soy oil call would be worth at least its intrinsic value of ₹ 40 which is the difference between the strike price and the futures price, plus any remaining time value.

In most cases, when an option is in the money and has time value it's common for someone to offset, in this case sell back the option, rather than exercising it. That's because exercising the option will yield only its intrinsic value. Any time value that remains will be forgone unless it is offset. Also, an extra brokerage commission may be incurred when exercising an option.

If the price of soy oil in April declines and is below the option strike price and your call option becomes out of the money, you can simply let the option expire or sell it back prior to expiration. In either case, your loss on the option position can be no greater than the premium paid, and you still will be able to purchase your soy oil at the lower market price.

Question:

Find out the strategy used by the food processor to hedge soybean oil in foreign exchange.

Source: http://agmarketing.extension.psu.edu/Commodity/PDFs/Future_options_eginners.pdf

6.5 Summary

- The value of an option is determined by its chance to be exercised with profit on the expiry day. This consists of two parts: the real value and the time value.

Notes

- The real value is the value that is possible to 'touch'. Conversely the time value is the value of the possibility that good news will occur during the time to maturity in order for an option to have a real value on the expiry day.
- Put-call is nothing but a relationship that must exist between the prices of European put and call options having same underlying assets, strike price and expiration date.
- The price of an option contract is that amount which is paid by the option buyer to the option seller. This is otherwise, known as option premium.
- The different factors or determinants which effect option prices are Current Stock Price, Exercise Price, Volatility, Risk free Interest Rates, Cash Dividends and Time to Expiration.
- To better understand the significance and option pricing techniques, we have to go through two important models of option valuation like Black-Scholes model and Binomial model.
- This unit also discusses at large the Put-Call parity under the 'with dividend' and 'no dividend' model.
- Put-call parity is a classic application of arbitrage-based pricing – it does not instruct us on how to price either put or call options, but it gives us an iron law linking the two prices.
- The put-call parity states that the difference in price between a call-option and a put-option with the same terms should equal the price of the underlying asset less the present discounted value of the exercise price.
- In finance, the binomial options pricing model provides a generalisable numerical method for the valuation of options.
- The binomial model was first proposed by Cox, Ross and Rubinstein (1979).
- The Black-Scholes model, often simply called Black-Scholes, is a model of the varying price over time of financial instruments, and in particular stock options.

6.6 Keywords

American-style option: An American-style option is an option that may be exercised at any time during the life of the option.

Intrinsic value: The intrinsic value of a call option is that amount by which stock price exceeds the strike price, whenever the option is in-the-money.

Option price: The price of an option contract is that amount which is paid by the option buyer to the option seller.

Pari options: Options where the strike price and stock price corresponds are 'at-the-money' and are called pari options.

Put-call parity: Put-call parity is a classic application of arbitrage-based pricing – it does not instruct us on how to price either put or call options, but it gives us an iron law linking the two prices.

Real Value: The real value is the value that is possible to 'touch'.

Time Value: The time value is the value of the possibility that good news will occur during the time to maturity in order for an option to have a real value on the expiry day.

Volatility: The volatility of a stock price represents the uncertainty attached to its future movement.

Notes

6.7 Review Questions

1. Briefly discuss the factors affecting option value.
2. What are the basic principles of option valuation?
3. What do you understand by put-call parity?
4. Discuss the effect of a dividend payable on the underlying shares on the call and put option prices.
5. What do you mean by 'binomial'? Explain with suitable example the application of Binomial model for the valuation of options.
6. State the basic feature and assumptions of Black-Scholes Option Valuation.
7. Explain the Black-Scholes model for the valuation of European call option. How is this different from valuation of put option?
8. Consider the following information with regard to a call option on the stock of XYZ Company.

   Current price of the share, S0 = ₹ 120

   Exercise price of the option, E = ₹ 115

   Time period to expiration = 3 months. Thus, t = 0.25 years.

   Standard deviation of the distribution of continuously compounded rates of return, s = 0.6

   Continuously compounded risk-free interest rate, r = 0.10

   Calculate the value of the call option using Black-Scholes Model.
9. Using the Black-Scholes model, calculate the value of a European call option using the following data:

   Exercise price = ₹ 65, Stock price- ₹ 60, Time to Expiration = 6 months

   Continuously compounded risk-free rate of return= 15 % p.a.

   Variance of rate of return is 0.25.
10. TISCO shares are currently selling at ₹ 75. Assume that at the end of three months, it will be either ₹ 90 or ₹ 60. The risk-free rate of return with continuous compounding is 10% p.a. Calculate the value of a three-month European call option on TISCO share with exercise price of ₹ 70.

Answers: Self Assessment

1.	European	2.	Arbitrage-based pricing
3.	Discounted	4.	Arbitrage
5.	Put-call parity	6.	Price
7.	Option premium	8.	Stock
9.	Risk-free	10.	Present value
11.	True	12.	False
13.	False	14.	True
15.	True		

6.8 Further Readings

Notes

Books

Chance, Don M. *An Introduction to Derivatives*, Dryden Press, International Edition

Chew, Lilian: *Managing Derivative Risk*, John Wiley, New Jersey.

Das, Satyajit: *Swap & Derivative Financing*, Probus.

Derivatives Market NCFM Module, NSE India Publications

Online links

http://nordic.nasdaqomxtrader.com/trading/optionsfutures/Education/Valuation_of_Options/

http://agmarketing.extension.psu.edu/Commodity/PDFs/Future_options_eginners.pdf

http://faculty.washington.edu/ezivot/econ422/Options%20EZ.pdf

http://srikant.org/thesis/node6.html

Notes

Unit 7: Application of Futures Contracts

CONTENTS

Objectives

Introduction

7.1 Payoff for Futures Derivatives Contracts

7.1.1 Going Long – Buy Futures

7.1.2 Going Short – Sell Futures

7.1.3 Long Hedging – Short Spot and Long Futures

7.1.4 Short Hedging — Long Spot and Short Futures

7.2 Difference between Trading Securities and Trading Futures on Individual Securities

7.3 Use of Futures (Only Simple Strategies of Hedging, Speculation and Arbitrage)

7.3.1 Process of Hedging through Futures

7.3.2 Speculation using Futures Contracts

7.3.3 Arbitrage Benefits Using Futures

7.4 Futures Application

7.4.1 Passive Management: Index Fund

7.4.2 General Strategy: Deposits to Portfolio

7.4.3 Beta Control

7.4.4 Asset Allocation Strategy

7.5 Summary

7.6 Keywords

7.7 Review Questions

7.8 Further Readings

Objectives

After studying this unit, you should be able to:

- Discuss the payoff for futures derivatives contracts;
- Describe the difference between trading securities and trading futures on individual securities;
- Explain the simple strategies of hedging, speculation and arbitrage;
- Solve the application-based problems of futures.

Introduction

In the previous unit, we understood the basic principles and concept of valuation of options. We also discussed about the pricing of option, the primary option pricing factors, options pricing

Notes

models including Binomial options Pricing Model (BOPM) and Black-Scholes model for Call Options. This unit will help you to discuss the payoff for futures derivatives contracts. We will also learn the difference between trading securities and trading futures on individual securities. The various sections and subsections of this unit will also summarise the simple strategies of hedging, speculation and arbitrage. To make the learning easier, we will take the help of globally recognised best practices.

As we have seen in the earlier units, a futures contract is an agreement between two parties to buy or sell an asset at certain time in the future at a certain price. Futures are instruments of hedging. Since hedging is explained in terms of risk, let us explain what risk is. Risk is not loss; rather, it is uncertainty about the expectation of a future event (e.g., forecast of tomorrow's price). The uncertainty may turn out to be favourable (i.e. profit) or unfavourable (i.e. loss). Risk is, thus, a neutral concept: profit and loss are merely two sides of the same coin called risk. Since hedging eliminates risk, it follows that hedging shuts the door closed to profit as well as loss: the investment is locked at a particular value, and it neither gains nor loses in value from subsequent price changes.

7.1 Payoff for Futures Derivatives Contracts

Futures contracts have linear payoffs. In simple words, it means that the losses as well as profits for the buyer and the seller of a futures contract are unlimited. These linear payoffs are fascinating as they can be combined with options ant he underlying to generate various complex payoffs.

Essentially, futures contracts try to predict what the value of an index or commodity will be at some date in the future. Speculators in the futures market can use different strategies to take advantage of rising and declining prices.

Notes The most common are known as "going long," and "going short".

Did u know? Offsetting position type of settlement is evidenced in 90% of futures settlement worldwide. Entering into an offsetting position of futures transaction implies entering into a reverse trade of the initial position. The initial buyer (long) liquidates his position by selling (going short) a similar future contract, and initial seller (short) goes for buying (long) an identical contract. In our previous example, the long investor enters into a short Nifty Futures at delivery price of ₹ 3225. This is because the investor does not wish to take delivery (or rather cash settle) the futures. Offsetting is a process of carrying forward the transaction by changing sides.

7.1.1 Going Long – Buy Futures

When an investor goes long — that is, enters a contract by agreeing to buy and receive delivery of the underlying at a predetermined price — it means that he or she is trying to get profit from an anticipated increase in future price. The pay-off profile of 'going long' is depicted in figure 7.1.

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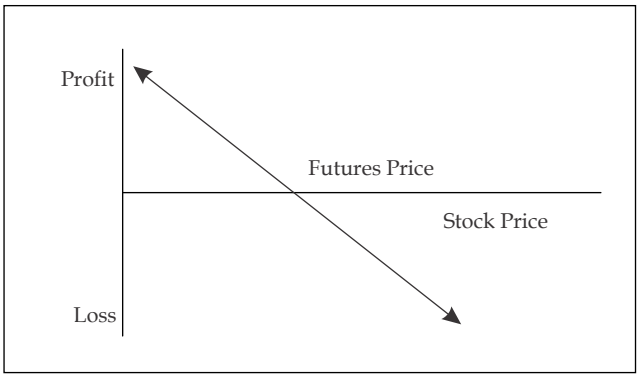
Figure 7.1: Pay-off profile of 'Going Long'



Example: Let's say that, with an initial margin of ₹ 2,000 in June, Ramesh, the speculator buys one September contract of gold at ₹ 350 per gram, for a total of 1,000 grams or ₹ 3,50,000. By buying in June, Ramesh is 'going long'; with the expectation that the price of gold will rise by the time the contract expires in September. By August, the price of gold increased by ₹ 2 to ₹ 352 per gram and Ramesh decides to sell the contract in order to gain a profit. The 1,000 gram contract would now be worth ₹ 3,52,000 and the profit would be ₹ 2,000. Given the very high leverage (remember the initial margin was ₹ 2,000), by going long, Ramesh made a 100% profit. Of course, the opposite would be true if the price of gold per gram had fallen by ₹ 2. The speculator would have realized a 100% loss. It's also important to remember that throughout the time the contract was held by Ramesh, the margin may have dropped below the maintenance margin level. He would have thus had to respond to several margin calls, resulting in an even bigger loss or smaller profit.

The salient features of going long strategy are:

1. ***Situation:*** Bullish outlook for the market. Price of the underlying expected to increase.
2. ***Risk:*** Unlimited as the price of the underlying, and hence of futures, falls, until it reaches zero.
3. ***Profit:*** Unlimited. It depends on the upward price movement.
4. ***Break-even:*** The price of the underlying (on maturity) equal to the futures price contracted.

7.1.2 Going Short – Sell Futures

A speculator who goes short — that is, enters into a futures contract by agreeing to sell and deliver the underlying at a set price — is looking to make a profit from declining price levels. By selling high now, the contract can be repurchased in the future at a lower price, thus generating a profit for the speculator.

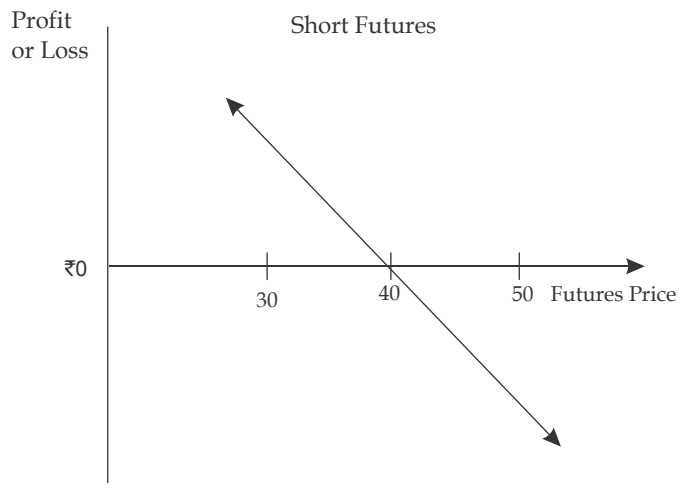
Example: Suppose June Crude Oil futures are trading at ₹ 40 and each futures contract covers 1000 barrels of Crude Oil. A futures trader enters a short futures position by selling 1 contract of June Crude Oil futures at ₹ 40 a barrel.

Case 1: A June Crude Oil future drops to ₹ 30: If June Crude Oil futures are trading at ₹ 30 on delivery date, then the short futures position will gain ₹ 10 per barrel. Since the contract size for Crude Oil futures is 1000 barrels, the trader will net a profit of ₹ 10 x 1000 = ₹ 10000.

Notes

Case 2: A June Crude Oil futures rises to ₹ 50: If June Crude Oil futures instead rallies to ₹ 50 on delivery date, then the short futures position will suffer a loss of ₹ 10 x 1000 barrel = ₹ 10000 in value.

Figure 7.2: Pay-off profile of 'Going Short'



The salient features of going short strategy are:

1 ***Situation:*** Bearish outlook for the market. Price of the underlying expected to fall.

2. ***Risk:*** Unlimited as the price of the underlying, and hence of futures, increase.

3. ***Profit:*** Unlimited. It depends on the downward price movement until the price of the underlying reaches zero.

4. ***Break-even:*** The price of the underlying (on maturity) equal to the futures price contracted.

Example: Let's say that Sonali did some research and came to the conclusion that the price of oil was going to decline over the next six months. She could sell a contract today, in November, at the current higher price, and buy it back within the next six months after the price has declined. This strategy is called going short and is used when speculators take advantage of a declining market. Suppose that, with an initial margin deposit of ₹ 3,000, Sonali sold one May crude oil contract (one contract is equivalent to 1,000 barrels) at ₹ 25 per barrel, for a total value of ₹ 25,000. By March, the price of oil had reached ₹ 20 per barrel and Sonali felt it was time to cash in on her profits. As such, she bought back the contract which was valued at ₹ 20,000. By going short, Sonali made a profit of ₹ 5,000. But again, if Sonali's research had not been thorough, and she had made a different decision, her strategy could have ended in a big loss.

7.1.3 Long Hedging – Short Spot and Long Futures

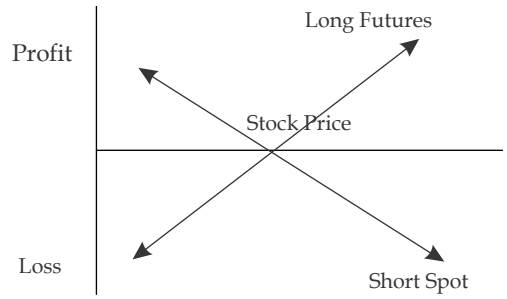
Hedges where long position is taken in a futures contract are known as long hedges. A long hedge is appropriate when a company knows it will have to purchase a certain asset in the future and wants to lock in a price now. A company that knows that it is due to buy an asset in the future can hedge by taking a long futures position. This is known as long hedge.

Caution A long hedge is initiated when a futures contract is purchased in order to reduce the price variability of an anticipated future long position.

Notes

Equivalently a long hedge locks in the interest rate of price of a cash security that will be purchased in the future subject to small adjustment due to the basis risk. A long hedge is also known as an anticipatory hedge, because it is effectively a substitute position for a future cash transaction. The pay-off profile of long hedging is depicted in Figure 7.3.

Figure 7.3: Pay-off profile of Long Hedging



The salient features of Long Hedging strategy in futures are:

1. ***Situation:*** Bullish outlook. Prices expected to rise.
2. ***Risk:*** No upside risk. Strategy meant to protect against rising markets.
3. ***Profit:*** No profits, no loss. In case of price increase, loss on the spot position offset by gain on futures position.

Caution In case of price fall, gain on the spot position offset by loss on futures position.

Example: Suppose that a tyre manufacturing company knows it will require 1,000 quintals of rubber on May 15. It is, say, January 15 today. The spot price of rubber is ₹ 5350 per quintal and the May futures price is ₹ 5210 per quintal. The company can hedge its position by taking a long position in 10 May futures contracts and closing its position on May 15. The strategy has the effect of locking in the price of the rubber that is required at close to ₹ 5,210 per quintal.

Suppose the price of rubber on May 15 proves to be ₹ 5,260 per quintal. Since May is the delivery month for the futures contract, this should be very close to the futures price. The company gains on the futures contracts = 1000 × (₹ 5,260-5,210) = ₹ 50,000. It pays 1,000 × ₹ 5,260 = ₹ 52,60,000 for the rubber. The total cost is therefore ₹ 52,60,000 - ₹ 50,000 = ₹ 52, 10,000 or ₹ 5,210 per quintal.

For an alternative outcome, suppose the futures price is ₹ 5,050 per quintal on May 15. The company loses approximately: 1,000 (₹ 5,210 – ₹ 5,050) = ₹ 1,60,000 on the futures contract and pays ₹ 1,000 × ₹ 5,050 = ₹ 50,50,000 for the rubber. Again the total cost is ₹ 52,10,000 or ₹ 5,210 per quintal.

Example: A greeting card company anticipated a large inflow of funds at the end of January when retail outlets pay for the stock of cards sold during the holiday's season in December. The management intends to puts ₹ 1 crore of these funds into a long-term bond because of the high yields on these investments. The current date is November 1 significantly by the time the firm receives the funds on February 1. Thus, unless a long hedge is initiated now, the financial manager believes that the return on investment will be significantly lower (the cost of the bonds significantly higher) than is currently available via the futures market.

Notes

Notes The primary objective of the long hedge is to benefit from the high long term interest rates, even though funds are not currently available for investment.

Disadvantages of Long Hedge

The disadvantages of a long hedge are as follows:

1. If the financial manager incorrectly forecasts the direction of future interest rates and a long hedge is initiated, then the firm still locks in the futures yield rather than fully participating in the higher returns available because of the higher interest rates.
2. If rates increase instead, to fall then bond prices will fall causing immediate cash outflow due to margin calls. This cash outflow will be offset only over the life of the bond via a higher yield on investment. Thus the net investment is the same but the timing of the accounting profits differs from the investment decision.
3. If the futures market already anticipates a fall in interest rates similar to the decrease forecasted by financial manager, then the futures price reflects this lower rate, negating any return benefit from the long hedge. Specifically, one hedges only against unanticipated changes that the futures market has not yet forecasted. Hence, if the eventual cash price increases only to a level below the current futures rice, then a loss occurs on the long hedge. Consequently, an increase in return from a long hedge in comparison to the future cash market investment occurs only if the financial manager is a superior forecaster of future interest rates. However, long hedge does lock in the currently available long-term futures rate, thereby reducing the risk of unanticipated changes in this rate.
4. Financial institutions are prohibited from employing long hedges, since their regulatory agencies believe that long hedges are similar to speculation, and these agencies do not want financial institutions to be tempted into affecting the institution's return with highly leveraged "speculative" futures positions.

Stock futures can be used as an effective risk management tool. Take the case of an investor who holds the shares of a company and gets uncomfortable with market movements in the short run. He sees the value of his security falling from ₹ 450 to ₹ 390. In the absence of stock futures, he would either suffer the discomfort of a price fall or sell the security in anticipation of a market upheaval. With security futures, he can minimize his price risk. All he needs do is enter into an offsetting stock futures position; in this case, take on a short futures position. Assume that the spot price of the security he holds is ₹ 390. Two-month futures cost him ₹ 402. For this he pays an initial margin. Now if the price of the security falls any further, he will suffer losses on the security he holds. However, the losses he suffers on the security will be offset by the profits he makes on his short futures position. Take for instance that the price of his security falls to ₹ 350. The fall in the price of the security will result in a fall in the price of futures.

Futures will now trade at a price lower than the price at which he entered into a short futures position. Hence his short futures position will start making profits. The loss of ₹ 40 incurred on the security he holds, will be made up by the profits made on his short futures position.

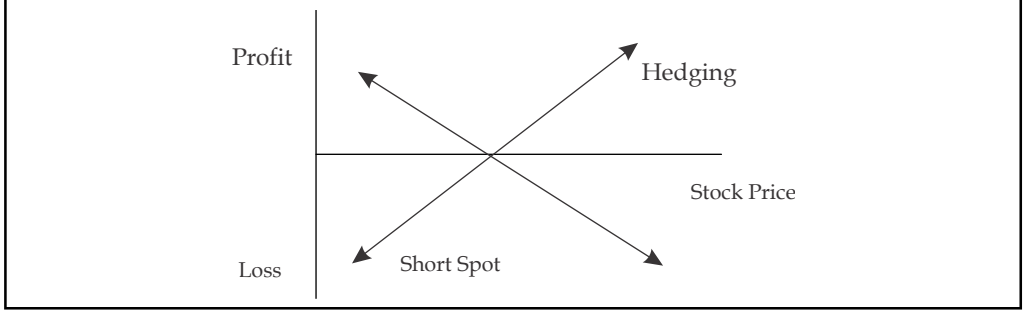
7.1.4 Short Hedging — Long Spot and Short Futures

A short hedge is one that involves a short position in futures contracts. A short hedge is appropriate when a hedger already owns an asset and expects to sell it at some time in future. It can also be used when a hedger does not own an asset right now, but knows that the asset will be owned at some time in the future. A hedger who holds the commodity and is concerned about

Notes

a decrease in its price might consider hedging it with a short position in futures. If the spot price and futures price move together, the hedge will reduce some of the risk. This is called short hedge because the hedger has a short position. A company that knows it is due to sell an asset at a particular time in the future can hedge by taking short futures position. This is known as a short hedge. The pay-off profile of short hedging is depicted in figure 7.4.

Figure 7.4: Pay-off Profile of Short Hedging



The salient features of short hedging strategy in futures are:

(a) ***Situation:*** Bearish outlook. Prices expected to fall. Protection needed against risk of falling prices.

(b) ***Risk:*** No downside risk. Strategy meant to protect against falling markets.

(c) ***Profit:*** No profits, no loss. In case of price increase, loss on the spot position is offset by gain on futures position. In case of price increase, gain on the spot position is offset by loss on futures position.

Example: Consider for example, an exporter knows that he will receive U.S. dollars in two months. The exporter will realise a gain if the U.S. dollar increases in value relative to the rupee and loss if the dollar decreases in value to the rupee. A short futures position leads to a loss if dollar appreciates and again if it depreciates in value. It has the effect of offsetting the exporter's risk.

If the spot price decreases, the futures price also will decrease since the hedger is short the futures contract. The futures transaction produces a profit that at least partially offsets the loss on the spot position. This is called a short hedge. Another type of short hedge can be used in anticipation of the future sale of an asset. It is taken out in anticipation of a future transaction in the spot market. This type of hedge is known as an anticipatory hedge.

Self Assessment

State whether the following statements are true or false:

1. The losses/profits for the buyer and the seller of a futures contract are limited in futures contracts.
2. A short hedge is appropriate when a company knows it will have to purchase a certain asset in the future and wants to lock in a price now.
3. A long hedge is also known as an anticipatory hedge.
4. A short hedge is one that involves a short position in futures contracts.

Notes

7.2 Difference between Trading Securities and Trading Futures on Individual Securities

Individuals and organisations are always looking for a way to increase revenues. An enticing concept to do this is to invest in trading securities. While all securities investments pose a risk of losing the capital investment, trading securities increases the chance of profits and losses. There are many factors involved when considering trading securities. To understand this, let's look at each of the components individually. Securities are equities or debentures of publicly traded companies that are bought and sold through brokerage firms. They are regulated by the U.S. Securities and Exchange Commission and offer no guarantee of return on investment. Securities, even bonds, fluctuate in value and pose a risk to the principal investment. Securities investments are offered for corporations ranging from large capitalization companies to extremely high risk penny stock ventures.

Trading is the purchase or sale of a specific security. It can be either an equity or debenture and is done via a brokerage firm. Individuals can have trades done either through a registered representative (a licensed Financial Industry Regulatory Authority broker) or make trades without a broker through an online brokerage trading firm. Trading can be done either in a cash account or through a margin account. Cash accounts require all transactions to be paid for in full by the settlement date three days after the trade execution. Margin accounts allow the investor to borrow money for the purchase of securities in hopes that they will not go down in price and a margin call for the difference is demanded by the brokerage firm.

Trading securities is the act of buying and selling securities with the intention of making a quick profit. Brokerage firms and investment advisers recommend buying securities for the anticipated long-term appreciation of the company. Trading securities involve the same stocks and bonds available to all investors on public exchanges. The difference is trading securities are timed by investors to buy low and sell high in short time frames. While all securities can be traded in this fashion, some securities have a natural ebb and flow that can be traded more regularly.

Example: Retail store chains expect higher fourth-quarter earnings as a result of holiday shopping that may lead investors to time early fourth quarter buying to be sold in the early first quarter.

To trade securities, a customer must open a security trading account with a securities broker and a Demat account with a securities depository Buying security involves putting up all the money upfront. With the purchase of shares of a company, the holder becomes a part owner of the company. The shareholder typically receives the rights and privileges associated with the security, which may include the receipt of dividends, invitation to the annual shareholders' meeting and the power to vote. Selling securities involves buying the security before selling it. Even in cases where short selling is permitted, it is assumed that the securities broker owns the security and then "lends" it to the trader so that he can sell it. Besides, even if permitted, short sales on security can only be executed on an up-tick.

To trade futures, a customer must open a futures trading account with a derivatives broker. Buying futures simply involves putting in the margin money. They enable the futures traders to take a position in the underlying security without having to open an account with a securities broker. With the purchase of futures on a security, the holder essentially makes a legally binding promise or obligation to buy the underlying security at some point in the future (the expiration date of the contract).

Security futures do not represent ownership in a corporation and the holder is therefore not regarded as a shareholder. A futures contract represents a promise to transact at some point in the future. In this light, a promise to sell security is just as easy to make as a promise to buy

Notes

security. Selling security futures without previously owning them simply obligates the trader to selling a certain amount of the underlying security at some point in the future. It can be done just as easily as buying futures, which obligates the trader to buying a certain amount of the underlying security at some point in the future.

Self Assessment

Fill in the blanks:

5. …… are equities or debentures of publicly traded companies that are bought and sold through brokerage firms.
6. …… is the purchase or sale of a specific security.
7. …… require all transactions to be paid for in full by the settlement date three days after the trade execution.
8. Trading securities are timed by investors to buy …….and sell ……..in short time frames.
9. Selling securities involves buying the security before …….it.

7.3 Use of Futures (Only Simple Strategies of Hedging, Speculation and Arbitrage)

There are three major categories of people who use futures: hedgers, speculators and arbitrager. The hedger uses the futures market to manage price risk for products they have or expect to have. Risk is transferred to the speculator. The speculator accepts the risk with the anticipation of earning a profit. Speculators have no intentions of buying or selling actual commodities. The arbitrager does not actively participate in the futures market (doesn't buy or sell futures) but uses the information provided in the futures market. Possible uses include establishing price outlook and evaluating other pricing alternatives. Let us discuss some simple strategies of hedging, speculation and arbitrage.

7.3.1 Process of Hedging through Futures

To hedge something is to construct a protective fence around it. Applied to financial markets, hedging implies eliminating the risk in an asset or a liability. Applied to stock market, hedging implies eliminating the risk in an investment portfolio. Hedging is the process of reducing exposure to risk. Thus, a hedge is any act that reduces the price risk of a certain position in the cash market. Futures contracts are the primary tools of effective hedging and they enable the market participants to change their risk exposure from unexpected adverse price fluctuations. Futures act as a hedge when a position is taken in them which are just opposite to that taken by the investor in the existing cash position.

Notes Hedgers sell futures (short futures) when they have already a long position on the cash asset, and they buy futures (long futures) in the situation of having a short position (advance sell) on the cash asset.

Hedging is one of the three principal ways to manage risk, the others being diversification and insurance (i.e., insurance as applied to investments). Let us bring out the distinction between the three. Diversification minimises risk for a given amount of return (or, alternatively, maximises return for a given amount of risk). Hedging eliminates both sides of risk: the potential profit

Notes

and the potential loss. Insurance resolves risk into profit and loss, and eliminates the loss while retaining the profit. Diversification is affected by choosing a group of assets instead of a single asset (i.e., technically, by adding positively and imperfectly correlated assets). Hedging is implemented by adding a negatively and perfectly correlated asset to an existing asset. Insurance for investment is achieved by buying a put option on the investment. Diversification and hedging do not have cost in cash but may have an opportunity cost. Insurance, on the other hand, has explicit cost incurred in cash.

Example: Suppose on June 30th the rice producer predicts that his produce will be 500,000 kgs. after three months. He wants to eliminate the price risk, i.e. he wants to lock in the future price of his produce. Now, the October futures contracts are trading at ₹ 3.22/kg., and each contract consists of 5,000 kgs. This price is acceptable to the producer, so he sells 100 rice futures contracts at this price. Now on the day of maturity of the contract, if the price goes below ₹ 3.22, he is safe. On the other hand if the spot price of the corn goes above ₹ 3.22, the producer loses the additional profit. Here the futures eliminate downside risk, but limits upside profit potential. After selecting the futures commodity and expiration month, the hedger must decide whether to go long or short.

The basic steps in hedging strategy using futures contracts are:

1. Deciding to use what kind of derivatives and if futures contract, then should it be long futures or short futures.
2. Deciding the type and nature of Futures contract to be used for hedging the spot position. Keeping in view that most hedging is cross hedging, this requires deciding the futures contracts to use whose underlying asset is perfectly correlated with price movement in original asset.
3. Selection of a contract month. This depends upon such period where the futures and spot prices are highly correlated. In practice, hedging with the near month futures contract is preferable because it minimizes the basis variation (basis = spot price – futures price).

Caselet

Case of a Corn Producer

Let us consider the following case of a corn producer. A rice producer uses the futures market to lock in a price for produce. The farmer here is a hedger, he is not concerned about how the cash price and the futures price move, because both the futures prices and the cash price tend to move together assuring a gain in one market to cover the loss in the other market. Futures contract for rice is traded for December, March, May, July and September delivery at NCDEX (National Commodity Derivative Exchange). The contracts are for 5,000 kgs. of rice. To begin with, the producer must decide when and how much to purchase in the futures market. Trading futures requires depositing initial margin and meeting margin calls if the market moves against the futures position taken by the hedger. In the case of options, the buyer need not put up margin money, but he will have to pay an option premium. The minimum loss in this case is the option premium paid.

Source: Mishra Bishnupriya (2007). *Financial Derivative*. Excel Books.

Concept of Hedge Ratio

The hedge ratio (HR) is the number of futures contacts one should use to hedge a particular exposure in the spot market. In other words, the hedge ratio is the ratio of the size of the position taken in futures contracts to the size of the exposure.

Notes

Hedge ratio (HR) = Quantity of futures position (Q_F)/Quantity of Cash Position (Q_S)

The number of futures contract, which minimizes risk, is given by

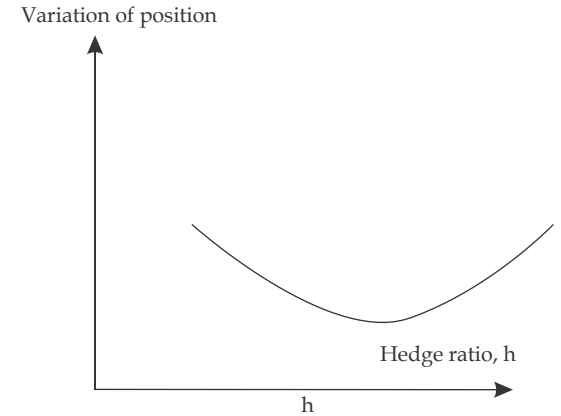
NFC = (QF / QS)*QFC

Where, QFC is the quantity (or units) of the underlying asset represented by each futures contract.

Generally the hedge ratio is 1.0. In case of perfect hedging (absence of asset mismatch and maturity mismatch), the hedge ratio should be one because the futures profit or loss matches the spot profit or loss. In simple form, the hedge ratio (HR) is defined as the ratio of size of futures contract position to the size of cash position (size of exposure). Size refers to the product of number of contract with the quantity (units) of the asset (underlying) represented by the contact (futures/ spot).

If the objective of the hedger is to minimize risk, a hedger ratio of 1.0 is not necessarily optimal. If hedgers wish to minimize the variance of their total positions, it may be optimal to use a hedge ratio different from 1.0 when there is no liquid futures contract that matures later than the expiration of the hedge. A strategy known as rolling the hedge forward is sometimes used. The optimal hedge ratio is the product of the coefficient of correlation between the change in spot price during a period of time equal to life of the hedge and change in futures price during a period of time equal to life of the hedge and the ratio of the standard deviation of change in spot price during a period of time equal to life of the hedge to the standard deviation of change in futures price during a period of time equal to life of the hedge.

Figure 7.5: Dependence of Variance of Hedgers' Position on Hedge Ratio



If the coefficient of correlation between the change in spot price during a period of time equal to life of the hedge and change in futures price during a period of time equal to life of the hedge is equal to 1 and standard deviation of change in spot price during a period of time equal to life of the hedge and the standard deviation of change in futures price during a period of time equal to life of the hedge are equal, the optimal hedge ratio, h, is 1.0. This is to be expected because in this case the futures price mirrors the spot price perfectly.

If the coefficient of correlation between the change in spot price during a period of time equal to life of the hedge and change in futures price during a period of time equal to life of the hedge is equal to 1 and the standard deviation of change in futures price during a period of time equal to life of the hedge is two times of the standard deviation of change in spot price during a period of time equal to life of the hedge, the optimal hedge ratio, h, is 0.5. This result is also as expected because in this case the futures price always changes by twice as much as the spot price.

Notes

Task NSE Nifty is currently trading in spot market at 3200. The cost of financing is 12% per annum. Calculate the fair value of 3-month futures of Nifty, when the dividend yield is 3% per annum.

7.3.2 Speculation using Futures Contracts

Speculators can also benefit from trading in futures contracts. When the underlying asset is expected to be bullish (rising prices), the speculator opts for buying futures; whereas when the underlying asset is expected to be bearish (falling prices), the speculator opts for buying futures. Both of these are described below using suitable illustrations.

Bullish Sentiment and Buying of Futures

Take the case of a speculator who has a view on the direction of the market. He would like to trade based on this view. He believes that a particular security that trades at ₹ 1,000 is undervalued and expects its price to go up in the next two–three months. How can he trade based on this belief? In the absence of a deferral product, he would have to buy the security and hold on to it.

Assume he buys 100 shares which cost him one lakh rupees. His hunch proves correct and two months later the security closes at ₹ 1,010. He makes a profit of ₹ 1,000 on an investment of ₹ 1,00,000 for a period of two months. This works out to an annual return of 6 %.

Today, a speculator can take exactly the same position on the security by using futures contracts. Let us see how this works. The security trades at ₹ 1,000 and the two-month futures trades at 1006. Just for the sake of comparison, assume that the minimum contract value is 1,00,000. He buys 100 security futures for which he pays a margin of ₹ 20,000. Two months later, the security closes at 1,010. On the day of expiration, the futures price converges to the spot price and he makes a profit of ₹ 400 on an investment of ₹ 20,000. This works out to an annual return of 12%. Because of the leverage they provide, security futures form an attractive option for speculators.

Bearish Sentiment and Buying of Futures

Stock futures can be used by a speculator who believes that a particular security is over–valued and is likely to see a fall in price. How can he trade based on his opinion? In the absence of a deferral product, there wasn't much he could do to profit from his opinion. Today all he needs to do is sell stock futures.

Let us understand how this works. Simple arbitrage ensures that futures on an individual security move correspondingly with the underlying security, as long as there is sufficient liquidity in the market for the security.

Notes If the security price rises, so will the futures price. If the security price falls, so will the futures price.

Now take the case of the trader who expects to see a fall in the price of SBI. He sells one two–month contract of futures on SBI at ₹ 240 (each contract for 100 underlying shares). He pays a small margin on the same. Two months later, when the futures contract expires, SBI closes at 220. On the day of expiration, the spot and the futures price converge. He has made a clean profit of ₹ 20 per share. For the one contract that he bought, this works out to be ₹ 2,000.

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7.3.3 Arbitrage Benefits Using Futures

Arbitrage refers to riskless profit earned by taking positions in spot/futures markets.

Following are two of the primary benefits that an arbitrageur can obtain using futures contracts:

Arbitrage: Overpriced futures: Buy spot, Sell futures

The cost-of-carry ensures that the futures price stay in tune with the spot price. Whenever the futures price deviates substantially from its fair value, arbitrage opportunities arise.

If you notice that futures on a security that you have been observing seem overpriced, we would illustrate as to how to obtain riskless arbitrage profits. Say for instance, SBI trades at ₹ 1,000. One–month SBI futures trade at ₹ 1,025 and seem overpriced. As an arbitrageur, you can make riskless profit by entering into the following set of transactions:

1. On day one, borrow funds; buy the security on the cash/spot market at 1,000.
2. Simultaneously, sell the futures on the security at ₹ 1,025.
3. Take delivery of the security purchased and hold the security for a month.
4. On the futures expiration date, the spot and the futures price converge. Now unwind the position.
5. Say the security closes at ₹ 1015. Sell the security.
6. Futures position expires with profit of ₹ 10.
7. The result is a riskless profit of ₹ 15 on the spot position and ₹ 10 on the futures position.
8. Return the borrowed funds.

When does it make sense to enter into this arbitrage? If your cost of borrowing funds to buy the security is less than the arbitrage profit possible, it makes sense for you to arbitrage. This is termed as cash–and–carry arbitrage.

Caution Remember however, that exploiting an arbitrage opportunity involves trading on the spot and futures market. In the real world, one has to build in the transactions costs into the arbitrage strategy.

Arbitrage: Under Priced Futures: Buy Futures, Sell Spot

Whenever the futures price deviates substantially from its fair value, arbitrage opportunities arise. It could be the case that you notice the futures on a security you hold seem under-priced. How can you cash in on this opportunity to earn riskless profits? Say for instance, ABB trades at ₹ 1,000. One-month ABB futures trade at ₹ 965 and seem under-priced. As an arbitrageur, you can make riskless profit by entering into the following set of transactions:

1. On day one, sell the security in the cash/spot market at ₹ 1,000.
2. Make delivery of the security.
3. Simultaneously, buy the futures on the security at ₹ 965.
4. On the futures expiration date, the spot and the futures price converge. Now unwind the position.
5. Say the security closes at ₹ 975. Buy back the security.

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6. The futures position expires with a profit of ₹ 10.

7. The result is a riskless profit of ₹ 25 on the spot position and ₹ 10 on the futures position.

If the returns you get by investing in riskless instruments are lesser than the return from the arbitrage trades, it makes sense for you to arbitrage. This is termed as reverse–cash-and-carry arbitrage. It is this arbitrage activity that ensures that the spot and futures prices stay in line with the cost of carry. As we can see, exploiting arbitrage involves trading on the spot market. As more and more players in the market develop the knowledge and skills to do cash-and-carry and reverse cash-and-carry, we will see increased volumes and lower spreads in both the cash as well as the derivatives market.

Task On Monday morning, an investor takes a long position in a pound futures contract that matures on Wednesday afternoon. The agreed-upon price is $1.70 for £62,000. At the close of trading on Monday, the futures price rises to $1.72. At Tuesday close, the price rises further to $1.73. At Wednesday close, the price falls to $1.71 and the contract matures. The investor takes delivery of the pounds at the prevailing price of $1.71. Detail the daily settlement process. What will be the investor's profit (loss)?

Self Assessment

Fill in the blanks:

10. There are three major categories of people who use futures: hedgers, …… and ……

11. Applied to stock market, hedging means eliminating the risk in an ……

12. …… minimizes risk for a given amount of return (or, alternatively, maximizes return for a given amount of risk).

13. The …… is the ratio of the size of the position taken in futures contracts to the size of the exposure.

14. Simple arbitrage ensures that futures on an …… security move correspondingly with the underlying security.

15. …… refers to riskless profit earned by taking positions in spot/futures markets.

7.4 Futures Application

Futures contracts can be very useful in limiting the risk exposure that an investor has in a trade. The main advantage of participating in a futures contract is that it removes the uncertainty about the future price of an item. By locking in a price for which you are able to buy or sell a particular item, companies are able to eliminate the ambiguity having to do with expected expenses and profits. The focus of this section is on the basic application related to the future contracts.

7.4.1 Passive Management: Index Fund

Index Futures are futures contracts with indexes as their underlying asset. NSE trades Nifty Futures with one month, two month, three month expiry cycles. All contracts expire on the last Thursday of every month. On the Friday following the Thursday a new contract having 3 months expiry would be introduced for trading. Index futures are futures contracts with an

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index instead of a physical asset as its underlying asset. Indeed, index futures are one of the most important financial futures in the world today and opened up the way for futures traders to trade and profit from the performance of a specific index directly instead of having to trade the entire basket of asset covered by the index.

The most important of index futures are index futures based on broad market indexes such as the S&P 500 Futures and the Nikkei 225 futures. These stock index futures allow futures traders to "Buy the market" or "sell the market" for the first time without having to simultaneously trade the hundreds of stocks that these indexes cover. In a way, trading index futures is really trading all the stocks or assets covered by an index in the capital weightage represented in the index. In fact, there are also mini index futures or simply known as "minis" which allows retail traders to perform leveraged speculation on their underlying index using very little money.

Example: **Index Futures Trading**

The S&P500 is at 1125.75 today. Assuming you are bearish on the S&P 500, you could take the short side of its near term futures contract which is currently the June 2010 contract priced at 1125.8 points. Initial margin requirement for this contract is about $28,000. Assuming you are short one contract of the June 2010 and S&P500 drops to 1000 points, you make:

1125.75 - 1000 = 125.75 points

125.75 x $250 = $31,437.50

$31,437.50 / $28,000 = 112% profit

The S&P500 dropped by only 11% but you make 112% profit by speculating through the S&P500 index futures. That's speculating with leverage.

All index futures contracts on NSE futures trading system are coded. Each futures contract has a separate limit order book. All passive orders are stacked in the system in terms of price-time priority and trades take place at the passive order price. The best buy order for a given futures contract will be the order to buy at the index at the highest index level where as the best sell order will be the order to sell the index at the lowest index level. Futures are very convenient in constructing a portfolio.

Table 7.1: Trade specifications of Nifty Futures

Underlying asset:	S& P CNX Nifty
Exchange of Trading:	NSE
Security Descriptor:	N FUTIDX NIFTY
Contract size:	Permitted lot size is 200 and multiples thereof
Price steps	₹ 0.05
Price bands:	Not applicable
Trading Cycle:	Near month
	Next Month
	Far month
Expiry day:	Last Thursday of the month
Settlement basis:	Mark of Market and final settlement will be cash settled on T+1 basis
Settlement Price:	Daily settlement price will be closing pricing futures contracts for the trading day and the final settlement price shall be the closing value of the underlying index on the last trading day.

Notes

Example: Let us assume that we wish to structure an index fund of ₹10 million and that the current price of the S&P 500 future is ₹ 500. Each contract is, therefore, equivalent to a common stock exposure of 500 times ₹ 500, or ₹ 2,50,000. To gain an exposure of ₹ 10 million in common stocks, one could easily and quickly purchase 40 S&P 500 futures contracts.

Their advantages are:

- Lower transaction costs
- Higher liquidity in futures markets
- Portfolio construction via futures market offers the advantage of actually buying the index
- No dividends to reinvest.

Did u know? The maximum brokerage chargeable by a trading member in relation to trades affected in the contracts admitted to dealing on the F& O segment of NSE is 2.5% of the contract value. The transaction charges payable by a TM for the trades executed by him on the F&O segments are fixed at ₹ 2 per lakh of turnover (0.002%) (each side) or ₹ 1 lakh annually, whichever is higher. The trading members also contribute o the Investor Protection Fund of F&O segment at the rate of ₹ 10 per crore of business done.

Stock Futures

Trading in individual stock futures have commenced on NSE from November 2001. These contracts are cash settled on a T+1 basis. The expiration cycle for stock futures is the same as for index futures. A new contract is introduced on the trading day following the expiry of the near month contract.

Stock index futures are traded in terms of number of contracts. Each contract is to buy or sell a fixed value of the index. The value of the index is defined as the value of the index multiplied by the specified monetary amount. In the S&P 500 futures contract traded at the Chicago Mercantile Exchange (CME), the contract specification states:

1 Contract = $250 * Value of the S&P 500

Did u know? Speculating using stock index futures is exactly the same as speculating in any futures contract; taking the Long side when bullish and taking the short side when bearish.

7.4.2 General Strategy: Deposits to Portfolio

A second application of futures involves cash contributions (withdrawals) or a large deposit to an existing portfolio. Buying additional common stock with a sudden large cash inflow may take time – time during which one is exposed to significant market moves.

Stock index futures offer an alternative.

Example: Let us assume that on day one ₹ 50 million is deposited to the portfolio. This deposit could immediately be invested in the stock market and the desired stock market exposure

Notes

achieved by buying ₹ 50 million worth of futures contracts. Given the assumptions of the index fund example, this could be accomplished by buying 200 contracts. These contracts can be sold off as desired individual issues are purchased for the portfolio. Assume that such stock purchases occur evenly over a ten day period from day two through day eleven. On each of these days, the portfolio manager buys ₹ 5 million worth of attractive stocks and sells one tenth of the futures contract position or approximately twenty eight contracts, the desired stock market exposure of the portfolio is maintained at all points of time.

Futures can be used in a similar fashion to manage portfolio withdrawals, although in the opposite way.

7.4.3 Beta Control

The third application involves implementing an active stock market judgment. Assume that a portfolio manager having a positive outlook for the stock market wishes to raise the exposure of a portfolio to market, i.e., wants to raise the beta of a portfolio. One way to move the portfolio beta up is to sell a number of lower beta stocks and buy an equivalent amount of higher beta stocks. The alternative approach would be to buy an appropriate amount of stock index futures.

The advantages of controlling beta by using stock index futures are:

- The target beta can be achieved almost immediately.
- The optimal stock mix is maintained.

7.4.4 Asset Allocation Strategy

A fourth futures application involves asset allocation. Assume that the manager of a large portfolio wishes to change the stock bond mix to reflect new investment judgments. The strategy can be implemented in two ways:

- The traditional way would be actually selling stocks in the market and buying bonds.
- The alternative way would be to use futures, i.e., selling the stock index futures and buying the equivalent Treasury bond futures.

In addition to advantages of lower implementation costs and quicker implementation, the alternative strategy causes minimum disruption and less money is required to alter the asset mix due to leveraged nature of a futures market.

Self Assessment

State whether the following statements are true or false:

16. By locking in a price companies are able to eliminate the ambiguity having to do with expected expenses and profits.
17. The most important of index futures are index futures based on broad market indexes such as the S&P500 Futures and the Nikkei 225 futures.
18. All passive orders are stacked in the system in terms of price-time priority and trades take place at the passive order price.
19. Individual stock futures contracts are cash settled on a T+2 basis.
20. One way to move the portfolio beta up is to sell a number of higher beta stocks and buy an equivalent amount of lower beta stocks.

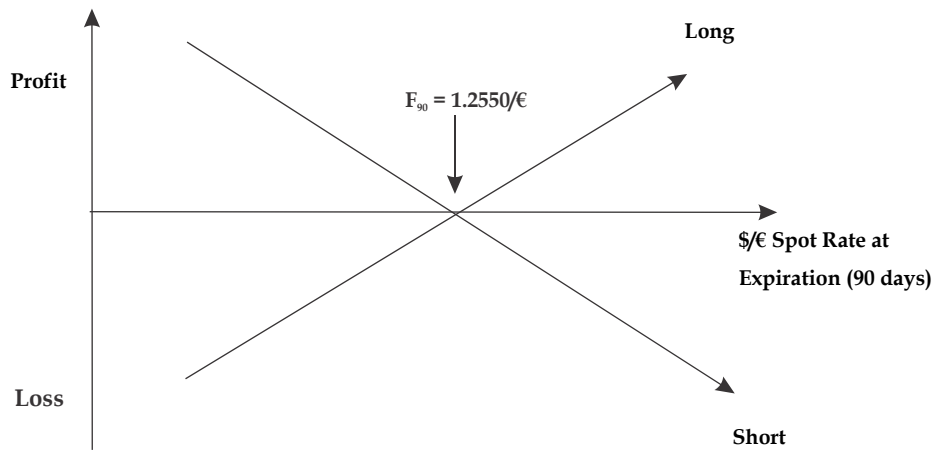
Notes

Case Study

Using Currency Futures for Hedging

GM has to pay €10m in three months for a delivery of parts from Germany invoiced in euro's. Worried? Over the next three months: $ ..... and € ..... For example, suppose the spot ex-rate is $1.25/€ and remains constant for 3 months, the parts will cost $12,500,000 ($1.25/€ x €10m). If the euro appreciates by 4% over the next three months, the ex-rate will be ..... and the parts will now cost ....., an increase of .....

Suppose that 3-month euro futures contracts are priced at $1.2550/€. Euro contracts are for €125,000, so GM would need 80 contracts to cover the €10m (€10 m / €125,000 = 80). GM would take a ..... position to hedge against the euro ..... Settlement will be in cash, not euro's. Suppose the euro is $1.30/€ in 3 months.



Questions:

Find out when GM will separately:

(a) Settle the futures contracts, and

(b) Buy the euro's in the spot market.

Source: spruce.flint.umich.edu/~mjperry/466-7.doc

7.5 Summary

- Futures contracts have linear payoffs. It means that the losses as well as profits for the buyer and the seller of a futures contract are unlimited.
- A long hedge is appropriate when a company knows it will have to purchase a certain asset in the future and wants to lock in a price now.
- Futures act as a hedge when a position is taken in them, which is just opposite to that taken by the investor in the existing cash position.
- Hedgers sell futures (short futures) when they have already a long position on the cash asset, and they buy futures (long futures) in the situation of having a short position (advance sell) on the cash asset. Primarily there are two kinds of hedge positions using futures namely, short hedge and long hedge.

Notes

- The unit discusses four types of hedging strategies namely, going long, going short, long hedging and short hedging.
- When an investor goes long, he enters a contract by agreeing to buy and receive delivery of the underlying at a pre-determined price. The investor going long is trying to profit from an anticipated future price increase.
- A speculator who goes short—that is, enters into a futures contract by agreeing to sell and deliver the underlying at a set price—is looking to make a profit from declining price levels. The methodology of hedging using futures is elaborately explained using illustrations.
- The hedge ratio is the number of futures contacts one should use to hedge a particular exposure in the spot market.
- Speculators can also benefit from trading in futures contracts. When the underlying asset is expected to be bullish (rising prices), the speculator opts for buying futures; whereas when the underlying asset is expected to be bearish (falling prices), the speculator opts for buying futures.
- The unit concludes by illustrating two of the primary benefits that an arbitrager can obtain using futures contracts.

7.6 Keywords

Arbitrage: Arbitrage refers to riskless profit earned by taking positions in spot/futures markets.

Beta: Beta is a measure of the systematic risk of a security that cannot be avoided through diversification.

Carry cost (CC): Carry cost is the interest cost of holding the underlying asset (purchased in spot market) until the maturity of futures contract.

Carry return (CR): Carry return is the income (e.g., dividend) derived from underlying asset during the holding period.

Hedge Ratio: The hedge ratio (HR) is the number of futures contacts one should use to hedge a particular exposure in the spot market.

Index Futures: Index Futures are futures contracts with indexes as their underlying asset.

Short hedge: A short hedge is one that involves a short position in futures contracts.

7.7 Review Questions

1. What do you mean by 'going short'? Take a numerical example to illustrate the usage of 'going short' in futures contracts for hedging purpose.
2. Hedging is the basic function of futures market. Discuss the statement in the light of uses of futures contract.
3. 'All hedging is not perfect'. Explain this statement in the light of cross hedging.
4. What is a short hedge? List its features and present its profit-loss pattern, by taking an example.
5. Write down the salient features of short hedging strategy, long hedging strategy going long strategy, and going short strategy in futures.

Notes

6. What are the disadvantages of long hedge?
7. Write down the difference between trading securities and trading futures on individual securities.
8. Define the term 'Hedge ratio'. Explain the concept and significance of hedge ratio.
9. Can futures contracts be used for speculation benefits? Support your answer with suitable numerical illustrations.
10. What do understand by 'arbitrage?' How can futures be useful for arbitrage gains?

Answers: Self Assessment

1.	False	2.	False
3.	True	4.	True
5.	Securities	6.	Trading
7.	Cash accounts	8.	Low, high
9.	Selling	10.	Speculators, arbitrager
11.	Investment portfolio	12.	Diversification
13.	Hedge ratio	14.	Individual
15.	Arbitrage	16.	True
17.	True	18.	True
19.	False	20.	False

7.8 Further Readings

Books

Chance, Don M. *An Introduction to Derivatives*, Dryden Press, International Edition

Chew, Lilian: *Managing Derivative Risk*, John Wiley, New Jersey.

Das, Satyajit: *Swap & Derivative Financing*, Probus.

Derivatives Market NCFM Module, NSE India Publications

Online links

ww.nyce.com (New York Futures Exchange)

www.nyse.com (New York Stock Exchange)

www.simen.com.sg (Singapore International Stock Exchange)

www.amex.com (American Stock Exchange)

www.cbot.com (Chicago Board of Exchange)

www.nse.org

http://www.nseindia.com/content/ncfm/ncfm_modules.htm

Notes

Unit 8: Application of Options

CONTENTS

Objectives

Introduction

8.1 Payoff for Options Derivatives Contracts

8.2 Use of Options (Only Simple Strategies of Hedging, Speculation and Arbitrage)

8.2.1 Sample Contract

8.2.2 Speculation and Hedging with Futures Options

8.2.3 Index Options

8.2.4 Stock Options

8.3 Summary

8.4 Keywords

8.5 Review Questions

8.6 Further Readings

Objectives

After studying this unit, you should be able to:

- Interpret the basic payoffs for options derivatives contracts;
- Discuss the speculation and hedging with futures options;
- Explain the index options and stock options;
- Describe the sample contract involving options on NIKKEI 225.

Introduction

In the previous unit, we understand the payoff for futures derivatives contracts and the difference between trading securities and trading futures on individual securities. We also discussed the simple strategies of hedging, speculation and arbitrage.

This unit will helps you to understand six basic payoffs for options derivatives contracts. We will also learn the simple strategies of hedging, speculation and arbitrage in options. The various sections and sub-section of this unit will also summarise the speculation and hedging with futures options, index options and stock options. To make the learning easier, we will take the help of globally recognised best practices.

We look here at some applications of options contracts. We refer to single stock options here. However since the index is nothing but a security whose price or level is a weighted average of securities constituting the index, all strategies that can be implemented using stock futures can also be implemented using index options.

8.1 Payoff for Options Derivatives Contracts

The opportunity characteristic of options results in a non-linear payoff for options. In simple words, it means that the losses for the buyer of an option are limited; however the profits are

Notes

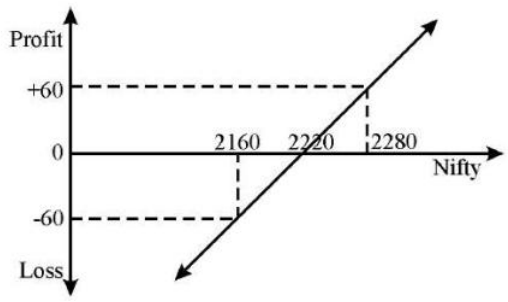
potentially unlimited. For a writer, the payoff is exactly the opposite. His profits are limited to the options premium; however his losses are potentially unlimited. These non-linear payoffs are fascinating as they lend themselves to be used to generate various payoffs by using combinations of options and the underlying. We look here at the six basic payoffs.

Payoff Profile of Buyer of Asset: Long Asset

In this basic position, an investor buys the underlying asset.

Example: Nifty for 2220 sells it at a future date at an unknown price, S_t. Once it is purchased, the investor is said to be "long" the asset. Figure 8.1 shows the payoff for a long position on the Nifty.

Figure 8.1: Payoff for investor who went Long Nifty at 2220



The figure 8.1 shows the profits/losses from a long position on the index. The investor bought the index at 2220. If the index goes up there is a profit else losses.

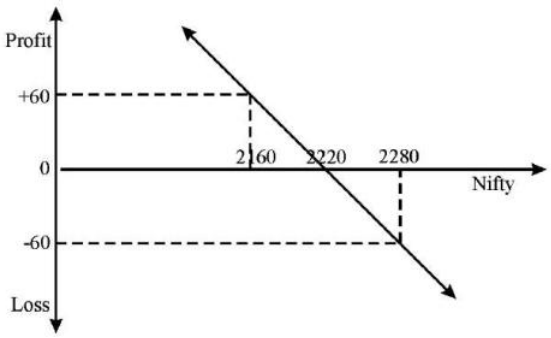
Payoff Profile for Seller of Asset: Short Asset

In this basic position, an investor shorts the underlying asset.

Example: Nifty for 2220 and buys it back at a future date at an unknown price, St. Once it is sold, the investor is said to be "short" the asset.

Figure 8.2 shows the payoff for a short position on the Nifty.

Figure 8.2: Payoff for investor who went Short Nifty at 2220



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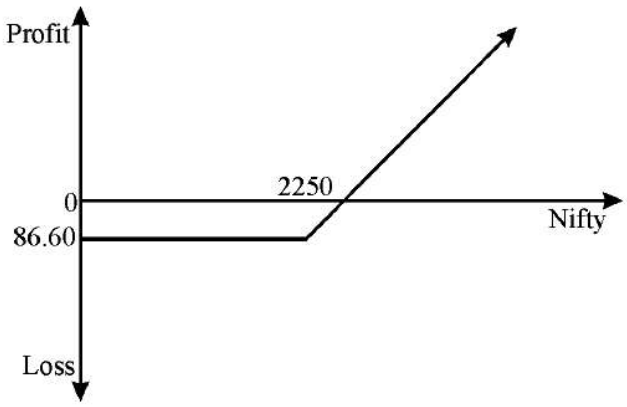
The figure 8.2 shows the profits/losses from a short position on the index. The investor sold the index at 2220. If the index falls, there are profits, else losses.

Payoff Profile for Buyer of Call Options: Long Call

A call option gives the buyer the right to buy the underlying asset at the strike price specified in the option. The profit/loss that the buyer makes on the option depends on the spot price of the underlying. If upon expiration, the spot price of the underlying is less than the strike price, he lets his option expire unexercised. His loss in this case is the premium he paid for buying option. Figure 8.3 gives the payoff for the buyer of a three month call option (often referred to as long call) with a strike of 2250 bought at a premium of 86.60.

Figure 8.3: Payoff for buyer of call option



The figure 8.3 above shows the profits/losses for the buyer of a three-month Nifty 2250 call option. As can be seen, as the spot Nifty rises, the call option is in-the-money. If upon expiration, Nifty closes above the strike of 2250, the buyer would exercise his option and profit to the extent of the difference between the Nifty-close and the strike price. The profits possible on this option are potentially unlimited. However if Nifty falls below the strike of 2250, he lets the option expire.

Notes The losses are limited to the extent of the premium paid for buying the option.

Payoff Profile for Writer of Call Options: Short Call

For selling the option, the writer of the option charges a premium. The profits/loss that the buyer makes on the option depends on the spot price of the underlying. Whatever is the buyer's profit is the seller's loss. If upon expiration, the spot price exceeds the strike price, the buyer will exercise the option on the writer. Hence as the spot price increases the writer of the option starts making losses. Higher the sport price more is the loss he makes. If upon expiration the spot price of the underlying is less than the strike price, the buyer lets his option expire unexercised and the writer gets to keep the premium. Figure 8.4 gives the payoff for the writer of a three month call option (often referred to as short call) with a strike of 2250 sold at premium of 86.60.

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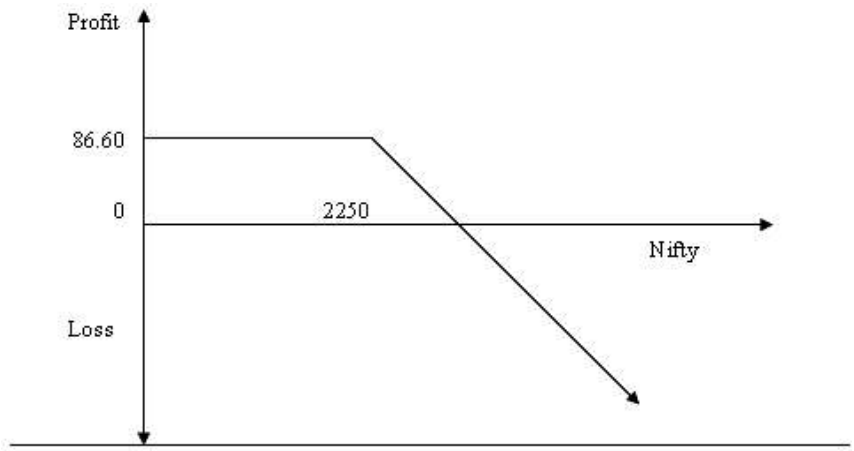
Figure 8.4: Payoff for writer of call option

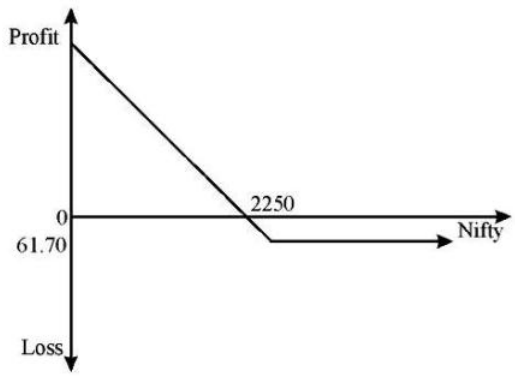


The figure 8.4 shows the profits/losses for the sale of a three-month Nifty 2250 call option. As the spot Nifty rises, the call option is in-the-money and the writer starts losses. If upon expiration, Nifty closes above the strike of 2250, the buyer would exercise his option on the writer who would suffer a loss to the extent of the difference between the Nifty-close and the strike price. The loss that can be incurred by the writer of the option is potentially unlimited, whereas the maximum profit is limited to the extent of the upfront option premium of ₹ 86.60 charged by him.

Payoff Profile for Buyer of Put Options: Long Put

A put option gives the buyer the right to sell the underlying asset at the strike price specified in the option. The profit/loss that the buyer makes on the option depends on the spot price of the underlying. If upon expiration, the spot price is below the strike price, he makes a profit. Lower the spot price more is the profit he makes. If the spot price of the underlying is higher than the strike price, he lets his option expire unexercised. His loss in this case is the premium he paid for buying the option. Figure 8.5 gives the payoff for the buyer of a three month put option (often referred to as long put) with a strike of 2250 bought at a premium of 61.70.

Figure 8.5: Payoff for buyer of put option



The figure 8.5 shows the profits/losses for the buyer of a three-month Nifty 2250 put option. As can be seen, as the spot Nifty falls, the put option is in-the-money. If upon expiration, Nifty closes below the strike of 2250, the buyer would exercise his option and profit to the extent of the

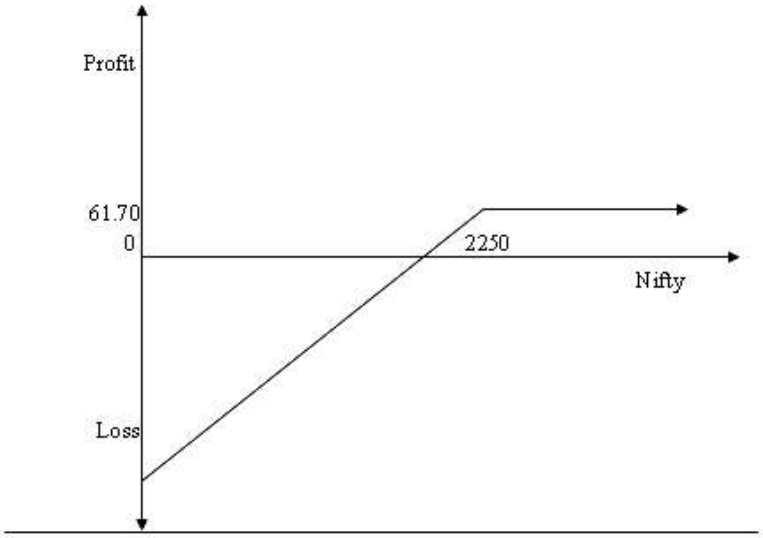
Notes

difference between the strike price and Nifty-close. The profit is possible on this option can be as high as the strike price. However, if Nifty rises above the strike of 2250, he lets the option expire. His losses are limited to the extent of the premium he paid for buying the option.

Payoff Profile for Writer of Put Options: Short Put

For selling the option, the writer of the option charges a premium. The profit/loss that the buyer makes on the option depends on the spot price of the underlying. Whatever is the buyer's profit is the seller's lost. If upon expiration, the spot price happens to be below the strike price, the buyer will exercise the option on the writer. If upon expiration the spot price of the underlying is more than the strike price, the buyer lets his option expire unexercised and the writer gets to keep the premium. Figure 8.6 give the payoff for the writer of a three month put option (often referred to as short put) with a strike of 2250 sold at a premium of 61.70.

Figure 8.6: Payoff for writer of put option



The figure 8.6 shows the profits/losses for the seller of a three-month Nifty 2250 put option. As the spot Nifty falls, the put option is in-the–money and the writer starts making losses. If upon expiration, Nifty closes below the strike of 2250, the buyer would exercise his option on the writer who would suffer a loss to the extent of the difference between the strike price and Nifty-close.

The loss that can be incurred by the writer of the option is a maximum extent of the strike price (Since the worst that can happen is that the asset price can fall to zero) whereas the maximum profit is limited to the extent of the upfront option premium of ₹ 61-70 charged by him.

Task Show with example the payoff for seller of call option at various strikes.

Self Assessment

Fill in the blanks:

1. The losses for the buyer of an option are .....however the profits are potentially unlimited.

Notes

2. A …… option gives the buyer the right to buy the underlying asset at the strike price specified in the option.
3. The profit/loss that the buyer makes on the option depends on the …… of the underlying.
4. For selling the option, the writer of the call /put option charges a …….
5. Whatever is the buyer's profit is the seller's ……...
6. If upon expiration, the spot price exceeds the ……., the buyer will exercise the option on the writer.
7. As the spot price ……. the writer of the call option starts making losses.
8. If upon expiration the spot price of the underlying is ……. than the strike price, the buyer lets his option expire unexercised and the writer gets to keep the premium.

8.2 Use of Options (Only Simple Strategies of Hedging, Speculation and Arbitrage)

The options on futures are similar to options on individual stocks and options on stock indices except that holders acquire the right to buy or sell futures contracts on the underlying assets rather than the assets themselves. A call option gives the holder a right to buy a futures contract while a put option gives a right to sell a futures contract.

Caution It is significant that the underlying in options on futures is a futures contract and not a commodity or financial asset represented by the futures contract.

To illustrate, the buyer of an S&P CNX Nifty futures contract call option has the right to assume a long position in the S&P CNX Nifty futures contract at the specified exercise price. Similarly, the buyer of an S&P CNX Nifty futures put option has the right to take a short position in the S&P CNX Nifty futures contract at the agreed exercise price. The seller of futures option on the other hand, assumes an obligation of taking a position (in futures contract) opposite to that of the buyer of the option. Thus, the writer of a call futures option has to be ready to take a short position in the S&P CNX Nifty futures and the writer of an S&P CNX Nifty put futures option has to be ready to accept a long position in the S&P CNX Nifty futures contract.

Did u know? In case of American style futures options, the exercise can take place on any trading day up to the date of expiration. Similarly, the option writers can liquidate their obligations by taking opposite positions (to the ones they hold) before exercise of their options.

An important way in which futures options differ from equity or index options is in respect of their expiration. Usually, for commodities, the option month refers to the delivery month of the futures contract while it (the option) expires on a specific date in the preceding month. The actual expiration date of a futures option varies with each contract in accordance with the stipulation laid in it in this regard. However, since futures on stock indices do not involve deliveries, and are only cash-settled, futures options on them may expire much earlier than the futures expiration.

Example: It is possible to trade July option on September futures contract with the option expiring at usual time in July and if exercised, then the position in the futures contract settled in September.

Notes

While in case of options on equity or stock indices a cash exchange occurs when an option is exercised, the same does not happen in case of futures option. Instead, in a futures option, the holder acquires a long position (in case of a call) or short position (in case of a put) at a price equal to the exercise price of the option. After this, when the acquired futures position is marked-to-market, the holder of a long position can withdraw an amount equal to the excess, if any, of the current futures price over the exercise price and the holder of a short futures position can withdraw a cash equivalent to the excess of the exercise price over the current futures price, in case it is positive. In effect, the exercise of a futures option leaves the holder with a futures contract with an unrealised gain equal to the exercisable value of the option.

Example: Suppose that on August 20, 2002, an investor buys a short S&P CNX Nifty index futures call for October expiration with an exercise price of 1530, for a premium of ₹ 15.50, or ₹ 3100 (the market lot of Nifty being 200, which implies that each point is worth ₹ 200). Now, assume that after six weeks, the October 2002 S&P CNX Nifty futures contract is at 1575 and the investor decides to exercise his call option and acquire a long futures position at 1575. This would give the investor an unrealised profit of ₹ 9000 [(1575 - 1530) x 200]. In order to realise this gain, the investor should take a short position in October 2002 S&P CNX Nifty futures contract at 1575. Since the futures prices change continuously, the profit of ₹ 9000 is not guaranteed. In case the profit realised by taking a short position by the investor, his net gain would be ₹ 5900, ₹ 9000 minus ₹ 3100 paid by him for buying the option on August 20.

8.2.1 Sample Contract

A sample contract involving options on NIKKEI 225 stock index futures is presented in Table 8.1. The underlying in this contract, traded at SIMEX (Singapore International Monetary Exchange Limited) is a futures contract on NIKKEI 225 stock index of Japan. As of now, such contracts are not available for trading in the Indian market.

Table 8.1: Options on NIKKEI 225 Stock Index Futures

Contract Site	One SIMEX Nikkei 225 Futures Contract		
Ticker Symbol	Calls: CNK Puts: PNK		
Contract Months	5 serial months and 5 quarterly months in the March, June, September and December cycle		
Trading Hours	Singapore	7.55 am	10.15 am
		11.15am	2.15 pm
	Tokyo	8.55 am	11.15 am
		12.15 am	3.15 pm
	London	11.55 pm	2.15 am
		3.15 am	6.15 am
	Chicago	5.55 pm	8.15 pm
		9.15 pm	12.15 am
	New York	6.55 pm	9.15 pm
		10.15 pm	1.15 am
Trading Hours on last Trading Day	Same as above		
Minimum Price	Five index points (¥2,500) except that fluctuation trades may occur at a price of (¥300) whether or not such trades result in the liquidation of positions for both parties to the trade.		

Contd....

Notes

Strike Price	500 Nikkei index points interval. Strike prices will be integers divisible by 500 without remainder
Trading Halt	There shall be no trading in any options contract when the Nikkei 225 Stock Index Futures contract is bid or offered: (1) at its initial daily price limit, or (2) at its expanded daily price limit, except that the above provisions shall not apply on an option's last day of trading.
Option Exercise	An option can be exercised by the buyer on any Nikkei 225 business day. In the absence of contrary instructions delivered to the Clearing House, an option in the March quarterly cycle that is in-the-money* will be exercised automatically on the day of determination of final settlement price. Similarly, an in-the-money** option that expires in a month other than those in the March quarterly cycle will be exercised automatically on the day of termination of trading.
Last Trading day	The day before the second Friday of the contract month.
Expiration	The expiration day for options in the March quarterly cycle (Mar, Jun, Sep, and Dec) will usually be the second Friday of the contract month. For contract months other than those in the March quarterly cycle, the options contract will expire on its last trading day.

Source: Singapore International Monetary Exchange Limited

*An option in the March quarterly cycle is in-the-money if the final settlement price of the underlying futures contract lies above the strike price in the case of call, or lies below the strike price in the case of a put.

** An option that expires in a month other than those in the March quarterly cycle is in-the-money if the settlement price of the underlying futures contract at the termination of trading lies above the strike price in the case of a call, or lies below the strike price in the case of a put.

8.2.2 Speculation and Hedging with Futures Options

The principles of speculation using futures options are similar to those with other options.

Example: If a speculator believes that the stock index is likely to decline significantly, he may write naked calls or buy put options. While the former involves pre-determined limited gain and unlimited risk, the latter involves a pre-determined maximum amount of loss but possibilities of large gains.

Of course, the more favourable the exercise price, the higher the put premium as well. Like with options on equity or stock index, hedging can be done with futures options as well. They are useful particularly to the individual investor who speculates with interest rates or stock index futures. If an investor buys a S&P CNX Nifty futures contract, he should stand to lose in case the index falls as his balance in margin account reduces being marked-to-market every day. To hedge against such potential losses, one could buy put options on S&P CNX Nifty futures. Similarly, one who is short S&P CNX Nifty futures contract can protect him by buying call options or writing put options.

Hedging: Have underlying buy puts: Owners of stocks or equity portfolios often experience discomfort about the overall stock market movement. As an owner of stocks or an equity portfolio, sometimes one may have a view that stock prices will fall in the near future. At other times one may witness massive volatility. The union budget is a common and reliable source of

Notes

such volatility: market volatility is always enhanced for one week before and two weeks after a budget. Many investors simply do not want the fluctuations of these three weeks.

Notes One way to protect your portfolio from potential downside due to a market drop is to buy insurance using put options.

Index and stock options are a cheap and can be easily implemented to seek insurance from the market ups and downs. The idea is simple. To protect the value of your portfolio from falling below a particular level, buy the right number of put options with the right strike price. If you are only concerned about the value of a particular stock that you hold, buy put options on that stock. If you are concerned about the overall portfolio, buy put options on the index. When the stock price falls your stock will lose value and the put options bought by you will gain, effectively ensuring that the total value of your stock plus put does not fall below a particular level.

This level depends on the strike price of the stock options chosen by you. Similarly when the index falls, your portfolio will lose value and the put options bought by you will gain, effectively ensuring that the value of your portfolio does not fall below a particular level. This level depends on the strike price of the index options chosen by you. Portfolio insurance using put options is of particular interest to mutual funds who already own well-diversified portfolios. By buying puts, the fund can limit its downside in case of a market fall.

Speculation: Bullish security, buy calls or sell puts: There are times when investors believe that security prices are going to rise. How does one implement a trading strategy to benefit from an upward movement in the underlying security?

Using options there are two ways one can do this:

1. Buy call options; or
2. Sell put options

We have already seen the payoff of a call option. The downside to the buyer of the call option is limited to the option premium he pays for buying the option. His upside however is potentially unlimited. Suppose you have a hunch that the price of a particular security is going to rise in a month's time. Your hunch proves correct and the price does indeed rise, it is this upside that you cash in on. However, if your hunch proves to be wrong and the security price plunges down, what you lose is only the option premium. Given that there are a number of one-month calls trading, each with a different strike price, the obvious question is: which strike should you choose? Let us take a look at call options with different strike prices. Assume that the current price level is 1250, risk-free rate is 12% per year and volatility of the underlying security is 30%. The following options are available:

1. A one month call with a strike of 1200.
2. A one month call with a strike of 1225.
3. A one month call with a strike of 1250.
4. A one month call with a strike of 1275.
5. A one month call with a strike of 1300.

Which of these options you choose largely depends on how strongly you feel about the likelihood of the upward movement in the price, and how much you are willing to lose should this upward movement not come about. There are five one-month calls and five one-month puts trading in the market. The call with a strike of 1200 is deep in-the-money and hence trades at a higher

Notes

premium. The call with a strike of 1275 is out-of-the-money and trades at a low premium. The call with a strike of 1300 is deep-out-of-money. Its execution depends on the unlikely event that the underlying will raise by more than 50 points on the expiration date. Hence buying this call is basically like buying a lottery. There is a small probability that it may be in-the-money by expiration, in which case the buyer will make profits. In the more likely event of the call expiring out-of-the-money, the buyer simply loses the small premium amount of ₹ 27.50.

As a person who wants to speculate on the hunch that prices may rise, you can also do so by selling or writing puts. As the writer of puts, you face a limited upside and an unlimited downside. If prices do rise, the buyer of the put will let the option expire and you will earn the premium. If however your hunch about an upward movement proves to be wrong and prices actually fall, then your losses directly increase with the falling price level. If for instance the price of the underlying falls to 1230 and you've sold a put with an exercise of 1300, the buyer of the put will exercise the option and you'll end up losing ₹ 70. Taking into account the premium earned by you when you sold the put, the net loss on the trade is ₹ 5.20.

Having decided to write a put, which one should you write? Given that there are a number of one-month puts trading, each with a different strike price, the obvious question is: which strike should you choose? This largely depends on how strongly you feel about the likelihood of the upward movement in the prices of the underlying. If you write an at-the-money put, the option premium earned by you will be higher than if you write an out-of-the-money put. However the chances of an at-the-money put being exercised on you are higher as well.

Speculation: Bearish security, sell calls or buy puts: Do you sometimes think that the market is going to drop? Could you make a profit by adopting a position on the market? Due to poor corporate results, or the instability of the government, many people feel that the stocks prices would go down. How does one implement a trading strategy to benefit from a downward movement in the market? Today, using options, you have two choices:

1. Sell call options; or
2. Buy put options

We have already seen the payoff of a call option. The upside to the writer of the call option is limited to the option premium he receives upright for writing the option. His downside however is potentially unlimited. Suppose you have a hunch that the price of a particular security is going to fall in a month's time. Your hunch proves correct and it does indeed fall, it is this downside that you cash in on. When the price falls, the buyer of the call lets the call expire and you get to keep the premium. However, if your hunch proves to be wrong and the market soars up instead, what you lose is directly proportional to the rise in the price of the security.

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One Month Calls and Puts Trading at Different Strikes

The spot price is 1250. There are five one-month calls and five one-month puts trading in the market. The call with a strike of 1200 is deep in-the-money and hence trades at a higher premium. The call with a strike of 1275 is out-of-the-money and trades at a low premium. The call with a strike of 1300 is deep-out-of-money. Its execution depends on the unlikely event that the price of underlying will raise by more than 50 points on the expiration date. Hence buying this call is basically like buying a lottery. There is a small probability that it may be in-the-money by expiration in which case the buyer will profit. In the more likely event of the call expiring out-of-the-money, the buyer simply loses the small premium amount of ₹ 27.50. Figure 1 shows the payoffs from buying calls at different strikes. Similarly, the put with a strike of 1300 is deep

Contd....

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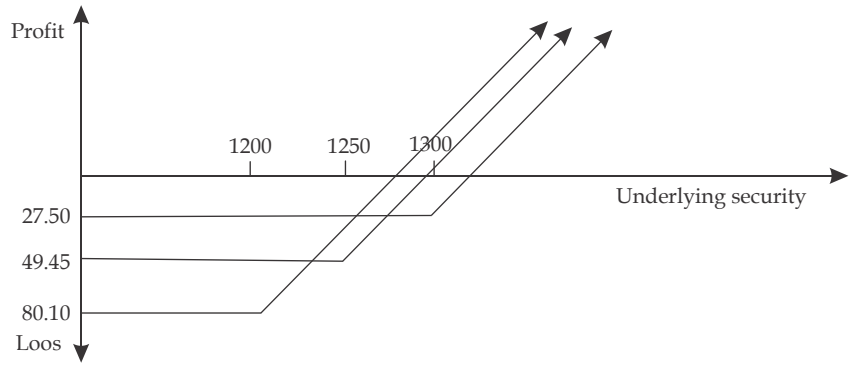
in-the-money and trades at a higher premium than the at-the-money put at a strike of 1250. The put with a strike of 1200 is deep out-of-the-money and will only be exercised in the unlikely event that underlying falls by 50 points on the expiration date. Figure 2 shows the payoffs from writing puts at different strikes.

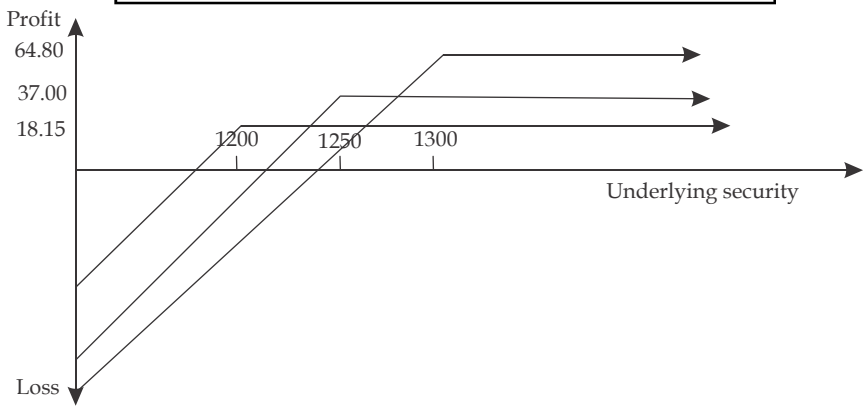
Figure 1: Payoff for Buyer of Call Options at Various Strikes

Underlying	Strike Price of Option	Call Premium (₹)	Put Premium (₹)
1250	1200	80.10	18.15
1250	1225	63.65	26.50
1250	1250	49.45	37.00
1250	1275	37.50	49.80
1250	1300	27.50	64.80



The figure 1 shows the profits/losses for a buyer of calls at various strikes. The in-the-money option with a strike of 1200 has the highest premium of ₹ 80.10 whereas the out-of-the- money option with a strike of 1300 has the lowest premium of ₹ 27.50.

Figure 2: Payoff for Writer of Put Options at Various Strikes



The figure 2 above shows the profits/losses for a writer of puts at various strikes. The in-the money option with a strike of 1300 fetches the highest premium of ₹ 64.80 whereas the out of- the-money option with a strike of 1200 has the lowest premium of ₹ 18.15.

In the example in Figure 2, at a price level of 1250, one option is in-the-money and one is out-of-the-money. As expected, the in-the-money option fetches the highest premium of ₹ 64.80 whereas the out-of-the-money option has the lowest premium of ₹ 18.15.

Source: http://www.nseindia.com/education/content/module_ncfm.htm

Notes

8.2.3 Index Options

The options contracts, which are based on some index, are known as Index options contract. However, unlike Index Futures, the buyer of Index Option Contracts has only the right but not the obligation to buy/sell the underlying index on expiry. Index Option Contracts are generally European Style options i.e. they can be exercised/assigned only on the expiry date.

An index in turn derives its value from the prices of securities that constitute the index and is created to represent the sentiments of the market as a whole or of a particular sector of the economy.

Notes Indices that represent the whole market are broad based indices and those that represent a particular sector are sectoral indices.

By its very nature, index cannot be delivered on maturity of the Index futures or Index option contracts therefore, these contracts are essentially cash settled on Expiry.

Did u know? Longer dated derivatives products are useful for those investors who want to have a long term hedge or long term exposure in derivative market. The premiums for longer term derivatives products are higher than for standard options in the same stock because the increased expiration date gives the underlying asset more time to make a substantial move and for the investor to make a healthy profit.

Contract specification for index options: On NSE's index options market; there are one-month, two-month and three-month expiry contracts with minimum nine different strikes available for trading. Hence, if there are three serial month contracts available and the scheme of strikes is 6-1-6, then there are minimum 3 x 13 x 2 (call and put options) i.e. 78 options contracts available on an index. Option contracts are specified as follows: DATE-EXPIRYMONTH-YEAR-CALL/PUT-AMERICAN/ EUROPEAN- STRIKE. For example the European style call option contract on the Nifty index with a strike price of 5000 expiring on the 26th November 2009 is specified as '26NOV2009 5000 CE'. Just as in the case of futures contracts, each option product (for instance, the 26 NOV 2009 5000 CE) has its own order book and its own prices.

Caution All index options contracts are cash settled and expire on the last Thursday of the month.

The clearing corporation does the novation. The minimum tick for an index options contract is 0.05 paisa. Table 8.2 gives the contract specifications for index options trading on the NSE.

Table 8.2: Contract Specification of S&P CNX Nifty Options

Underlying index	S&P CNX Nifty
Exchange of trading	National Stock Exchange of India Limited
Security descriptor	OPTIDX
Contract size	Permitted lot size shall be 50 (minimum value ₹ 2 lakh)
Price steps	₹ 0.05

Contd....

Notes

Price bands	A contract specific price range based on its delta value and is computed and updated on a daily basis.
Trading cycle	The options contracts will have a maximum of three month trading cycle - the near month (one), the next month (two) and the far month (three). New contract will be introduced on the next trading day following the expiry of near month contract. Also, long term options have 3 quarterly and 5 half yearly expiries
Expiry day	The last Thursday of the expiry month or the previous trading day if the last Thursday is a trading holiday.
Settlement basis	Cash settlement on T+1 basis.
Style of option	European.
Strike price interval	Depending on the index level
Daily settlement price	Not applicable
Final settlement price	Closing value of the index on the last trading day.

8.2.4 Stock Options

Trading in stock options commenced on the NSE from July 2001. Currently these contracts are European style and are settled in cash. The expiration cycle for stock options is the same as for index futures and index options. A new contract is introduced on the trading day following the expiry of the near month contract. NSE provides a minimum of eleven strike prices for every option type (i.e. call and put) during the trading month. There are at least five in-the-money contracts, five out-of-the-money contracts and one at-the-money contract available for trading.

Self Assessment

State whether the following statements are true or false:

9. The options on futures are similar to options on individual stocks and options on stock indices except that holders acquire the right to buy or sell futures contracts on the underlying assets.
10. In case of European style futures options, the exercise can take place on any trading day up to the date of expiration.
11. The actual expiration date of a futures option varies with each contract in accordance with the stipulation laid in it in this regard.
12. In a futures option, the holder acquires a long position (in case of a put) or short position (in case of a call) at a price equal to the exercise price of the option.
13. Market volatility is always enhanced for one week before and two weeks after a budget.
14. The downside to the buyer of the call option is limited to the option premium he pays for buying the option.
15. The upside to the writer of the call option is limited to the option premium he receives upright for writing the option.

Notes

Case Study

Option on Reliance

An investor buys one European Put option on Reliance at the strike price of ₹ 300 at a premium of ₹ 25. If the market price of Reliance, on the day of expiry is less than ₹ 300, the option can be exercised as it is 'in the money'.

The investor's Breakeven point is ₹ 275 (Strike Price - premium paid) i.e., investor will earn profits if the market falls below 275.

Suppose stock price is ₹ 260, the buyer of the Put option immediately buys Reliance share in the market @ ₹ 260 & exercises his option selling the Reliance share at ₹ 300 to the option writer thus making a net profit of ₹ 15 {(Strike price - Spot Price) - Premium paid}.

In another scenario, if at the time of expiry, market price of Reliance is ₹ 320, the buyer of the Put option will choose not to exercise his option to sell as he can sell in the market at a higher rate. In this case the investor loses the premium paid (i.e. ₹ 25), which shall be the profit earned by the seller of the Put option.

Question:

Analyse the case and give suitable option strategy.

Source: Kulkarni B. (2011). "Commodity Markets & Derivatives". Excel Books.

8.3 Summary

- The opportunity characteristic of options means that the losses for the buyer of an option are limited.
- A call option gives the buyer the right to buy the underlying asset at the strike price specified in the option.
- For selling the option, the writer of the option charges a premium. The profits/loss that the buyer makes on the option depends on the spot price of the underlying.
- A put option gives the buyer the right to sell the underlying asset at the strike price specified in the option.
- For selling the option, the writer of the option charges a premium. The profit/loss that the buyer makes on the option depends on the spot price of the underlying.
- The options on futures are similar to options on individual stocks and options on stock indices except that holders acquire the right to buy or sell futures contracts on the underlying assets rather than the assets themselves.
- An important way in which futures options differ from equity or index options is in respect of their expiration.
- While in case of options on equity or stock indices a cash exchange occurs when an option is exercised, the same does not happen in case of futures option. Instead, in a futures option, the holder acquires a long position (in case of a call) or short position (in case of a put) at a price equal to the exercise price of the option.
- The principles of speculation using futures options are similar to those with other options.
- Owners of stocks or equity portfolios often experience discomfort about the overall stock market movement.

Notes

- The options contracts, which are based on some index, are known as Index options contract.
- An index in turn derives its value from the prices of securities that constitute the index and is created to represent the sentiments of the market as a whole or of a particular sector of the economy.

8.4 Keywords

Arbitrage: Arbitrage is basically buying in one market and simultaneously selling in another, profiting from a temporary difference.

Call options: A call option gives the holder the right to buy a security.

Contract: A contract is an agreement between two or more people that is legally binding.

Derivatives: A security whose price is dependent upon or derived from one or more underlying assets.

Equity: Equity is the capital amount which is raised or contributed by the members of the company.

Hedging: A risk management strategy used in limiting or offsetting probability of loss from fluctuations in the prices of commodities, currencies, or securities.

Index Options: It is an option whose underlying security is an index.

Options: An option is a contract to buy or sell a specific financial product officially known as the option's underlying instrument or underlying interest.

Payoff: An option gives the option holder the right/option, but no obligation, to buy or sell a security to the option writer/seller.

Put Option: A put option gives the holder the right to sell a security.

Speculation: Speculation in the stock market is when someone believes a stock or commodity is going to up, without basing that on any technical or fundamental analysis.

Strike Price: It is the specified price on an option contract at which the contract may be exercised, whereby a call option buyer can buy the underlier or a put option buyer can sell the underlier.

Trading Halt: It is a temporary suspension in the trading of a particular security on one or more exchanges, usually in anticipation of a news announcement or to correct an order imbalance.

8.5 Review Questions

1. What are the six basic payoffs?
2. "The options on futures are similar to options on individual stocks and options on stock indices." Explain.
3. Describe the Sample Contract.
4. "The principles of speculation using futures options are similar to those with other options." Elucidate.
5. Can Index and stock options be easily implemented? If yes, give reasons with support of your answer.
6. How does one implement a trading strategy to benefit from an upward movement in the underlying security?

Notes

7. Define Index Options.
8. What is the Contract specification for index options?
9. What are Stock Options?
10. What are the different options that an investor would choose to deal with bearish securities in a given financial market?

Answers: Self Assessment

1.	Limited	2.	Call
3.	Spot price	4.	Premium
5.	Loss	6.	Strike price
7.	Increases	8.	Less
9.	True	10.	False
11.	True	12.	False
13.	True	14.	True
15.	True		

8.6 Further Readings

Books

Derivatives Market NCFM Module. National Stock Exchange India Limited Publications: Bombay: 2007.

Gupta S.L. (2007). *Financial Derivatives.* Prentice Hall. New Delhi.

Jaynath Rama Varma (2008). *Derivatives and Risk Management*. Tata McGraw Hill Publications: New Delhi.

2008. *Indian Stock Market Review* National Stock Exchange Publications.

Online links

http://derivativesindia.com

http://derivativesindia.com/scripts/glossary/index.aricles_e-articles

http://www.margrabe.com/Dictionary/derivatives/html

http://www.sebi.gov.in

http://www.nseindia.com/f&o

Notes

Unit 9: Trading Futures and Option

CONTENTS

Objectives

Introduction

9.1 Futures and Options Trading System

9.1.1 Entities in the Trading System

9.1.2 Types of Traders

9.1.3 How Trader's Trade

9.1.4 Basis of Trading

9.2 Corporate Hierarchy

9.2.1 Client Broker Relationship in Derivative Segment

9.3 Order types and Conditions

9.4 Summary

9.5 Keywords

9.6 Review Questions

9.7 Further Readings

Objectives

After studying this unit, you should be able to:

- Discuss the futures and options trading system;
- Explain the types of traders in trading;
- Describe corporate hierarchy in trading;
- Describe the order types and conditions in trading.

Introduction

In the previous unit, you have studied about the pay-off for options derivatives contracts and use of options. We also discussed about the simple strategies of hedging, speculation and arbitrage in options like index options, stock options. This unit will helps you to understand the trading system of futures and options contracts. We will also learn the various types of traders. The various sections and sub section of this unit will also explain the entities in the trading system, basis of trading, corporate hierarchy and client broker relationship in derivative segment. Further, we will end up the unit with order types and conditions in trading system. To make the learning easier, we will take the help of globally recognised best practices.

A future trading is an important economic activity for the development of an economy. Being the first form of derivatives trading, it is a specialised field which requires professional expertise and adequate knowledge in this area. To be a successful market operator (as a speculator, arbitrageur, trader, investor or hedger) one must have adequate information and proper understanding of the functioning of the futures markets. These are essential to make evaluation of derivatives products in terms of their prices and values so that the market participants can select them as per their objectives.

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Futures are useful to the market participants only if futures prices reflect information about the prices of the underlying assets. That is why it is essential to understand how futures markets work and how the prices of futures contracts relate to the spot prices. In this section, we will examine the factors that affect futures prices in general. The futures prices of different assets like commodities, foreign exchanges and securities are influenced by various factors which are not common for all such assets. For example, futures prices of foreign currencies may be determined by different factors as different for determination of futures prices of food grains and vegetables.

9.1 Futures and Options Trading System

The futures & options trading system of NSE, called NEAT-F&O trading system, provides a fully automated screen-based trading for Nifty futures & options and stock futures & options on a nationwide basis as well as an online monitoring and surveillance mechanism. It supports an order driven market and provides complete transparency of trading operations. It is similar to that of trading of equities in the cash market segment.

Notes The software for the F&O market has been developed to facilitate efficient and transparent trading in futures and options instruments.

Keeping in view the familiarity of trading members with the current capital market trading system, modifications have been performed in the existing capital market trading system so as to make it suitable for trading futures and options.

Did u know? Future contracts are traded for the following reasons:

Leverage

One of the key benefits of trading in the futures markets is that it offers the trader financial leverage. Leverage is the ability of a trader to control large dollar amounts of a commodity with a comparatively small amount of capital. As such, leverage magnifies both gains and losses in the futures market.

Liquidity

Another key benefit of futures trading is liquidity. Liquidity is a characteristic of a market to absorb large transactions without a substantial change in the price. Liquid markets easily match a buyer with a seller, enabling traders to quickly transact their business at a fair price.

Transparency

Many futures markets are considered to be "transparent" because the order flow is open and fair. Everyone has an equal opportunity for the trade. When an order enters the marketplace, the order fills at the best price for the customer, regardless of the size of the order.

Financial Integrity

When making an investment, it is important to have confidence that the person on the other end of the trade will acknowledge and accept your transaction. Futures markets give you this confidence through a clearing service provider system that guarantees the integrity of your trades.

Notes

9.1.1 Entities in the Trading System

There are four parties/entities in the trading system. They are trading members, clearing members, professional clearing members and participants.

1. ***Trading members:*** Trading members are members of NSE. They can trade either on their own account or on behalf of their clients including participants. The exchange assigns a trading member ID to each trading member. Each trading member can have more than one user. The number of users allowed for each trading member is notified by the exchange from time to time. Each user of a trading member must be registered with the exchange and is assigned a unique user ID. The unique trading member ID functions as a reference for all orders/traders of different users. This ID is common for all users of a particular trading member.

   Caution It is responsibility of the trading member to maintain adequate control over persons having access to the firm's User IDs.

2. ***Clearing members:*** Clearing members are members of NSCCL. They carry out risk management activities and confirmation/inquiry of trades through the trading system.

3. ***Professional clearing members:*** A professional clearing members is a clearing member who is not a trading member. Typically, banks and custodians become professional clearing members and clear and settle for their trading members.

4. ***Participants:*** A participants is a client of trading members like it financial institutions. These clients may trade through multiple trading members but settle through a single clearing member.

9.1.2 Types of Traders

Traders play a vital role in the futures markets by providing liquidity. While futures are designed primarily to assist hedgers in managing their exposure to price risk, the market would not be possible without the participation of traders, or speculators, who provide a fluid market of buyers and sellers. Speculators provide the bulk of market liquidity, which allows the hedger to enter and exit the market in a more efficient manner.

In other words, the two main categories of traders are hedgers and speculators. Hedgers are those who use the futures market to manage price risk. Speculators, on the other hand, are those who use the futures market for the profit motive. As such, the speculator assumes a market risk for the potential opportunity to earn a profit. Futures traders can also be categorised in a number of other ways. There are full-time professional traders and part-time traders; traders who trade on the trading floor or behind a computer screen. Each of these market participants plays an important role in making the markets efficient places to conduct business.

Public Traders

The vast majority of speculators are individuals trading off the floor with private funds. This diverse group is generally referred to as "retail" business. With the growing movement from trading on the floor to the computer screen, the retail customer is becoming a more important force in futures trading. Further, with computer-based trading, "levelling the playing field" between the different types of traders has become a reality.

Notes

"Local" Traders

Perhaps the most visible and colourful speculator is the professional floor trader, or local, trading for his own account on the floor of an exchange. Locals come from all walks of life and frequently began their careers as runners, clerks or assistants to other traders and brokers. Locals are usually more interested in the market activity in the trading pit as opposed to the market activity in the underlying market fundamentals. With the popularity of electronic trading sweeping the industry, a trader who operates in a fashion similar to a floor local has emerged—the "electronic local."

Caution The electronic local trades using the same method as the local except they do so through the Internet and a computer rather than in the trading pits of Chicago.

Proprietary Traders

Another major category of trader is the proprietary trader, who works off the floor for a professional trading firm. These "upstairs" traders are employees of large investment firms, commercial banks and trading houses typically located in major financial centres. This group has a number of different trading objectives. Some engage in speculative trading activity, profiting when the market moves in their direction. Such proprietary traders are compensated according to the profits they generate. Other proprietary traders manage risk, hedging or spreading between different markets—both cash and futures—in order to insulate their business from the risk of price fluctuation or exploiting differences and momentary inefficiencies in market-to-market pricing.

Market Makers

Market makers give liquidity to the market, constantly providing both a bid (expression to buy) and an offer (expression to sell). Increasingly important in electronic markets, market makers ensure that traders of all kinds can buy and sell whenever they want. Market makers often profit from the "spread," or the small difference between the bid and offer (or ask) prices.

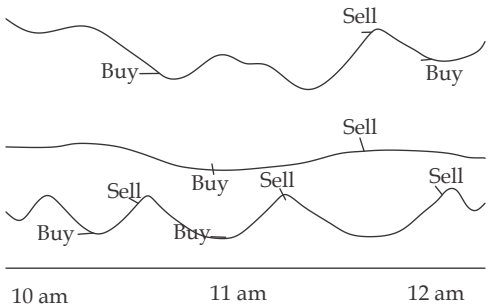
9.1.3 How Trader's Trade

Each of the types of traders previously described uses a different strategy to achieve his goals.

Scalpers

A scalper trades in and out of the market many times during the day, hoping to make a small profit on a heavy volume of trades. Scalpers attempt to buy at the bid price and sell at the ask price, offsetting their trades within seconds of making the original trade (see figure 9.1).

Figure 9.1: Scalp in Stock Trading



Notes

Scalpers rarely hold a position overnight and often don't trade or make predictions on the future direction of the market. Locals and market makers often employ a scalping strategy, which is the most common source of market liquidity

Notes Many scalpers like to concentrate on the sharp movements which frequently occur in the currency market. In this case, the aim is to exploit sudden changes in market liquidity for quick gains later. This kind of scalping is not very much concerned about the nature of the market traded, whether prices are trending or ranging, but attaches great importance to volatility. The purpose is to identify the cases where temporary shortages of liquidity create imbalances that offer trade opportunities.

Example: Let's consider traders of the EURUSD pair. In most cases, spreads are tight, and the market is liquid enough to prevent any meaningful gaps in the bid-ask spreads. But when, for whatever reason (often a news shock, but we don't concern ourselves with the cause here), liquidity dries out, and a significant bid-ask gap appears, the quote will be split into two distinct pieces of data: the bid is, let's say 1.4010, while the ask is 1.4050. A very short while, the bid-ask spread will narrow, and the price will gravitate rather hastily to one side. Scalpers use these very fast fluctuations for making quick profits. Right after the price has moved up to 1.4030, and the bid-ask spread has narrowed to normal levels, a scalper may sell, for example, and as volatility takes the price lower to, 1.4020, he closes his short position to open a long one, and so on. The point is to profit from the emotional reactions of the market by remaining calm, and betting that behind the sound and fury, there is nothing of significance, at least for the immediate term.

Day Traders

A day trader is similar to a scalper in that he or she also typically does not hold positions overnight and is an active trader during the trading day. Day traders trade both off and on the floor. A day trader makes fewer trades than a scalper, generally holds his positions for a longer period of time than a scalper, and trades based on a prediction on the future direction of the market. Proprietary traders, locals and public traders are often day traders.

Caselet

A Trader Thinks the Yen will Appreciate in Value Versus the Dollar (USD/JPY is at 108.65)

The price of the dollar-yen is dropping and is currently at 108.65. A day trader gets a sell signal based on his trading strategy. He sells 100,000 USD (1 lot) at 108.60 and receives 10,860,000 Japanese yen. Assuming a 2% margin requirement, the deposit would be 2,000 dollars. Right after placing his trade, the trader places a stop loss of 30 pips based on his day trading strategy. The trader was right and the yen appreciates versus the dollar (dollar loses value relative to the yen), pushing the exchange rate down to 107.50 yen at Satisfied with his profit, the trader sells the 10,860,000 yen at 107.50. He receives, 10,860,000 yen at 107.50 = 101,023 USD. Since he had originally paid (sold) 100,000 USD for the yen, his profit is 101,023 - 100,000 = 1,023.

Source: http://www.mydaytradingtutor.com/currency-trading-examples.htm

Notes

Notes Making profit in day trading.

Success in the day trading system happens when you behave like a professional trader. But how do professional day traders trade?

Each successful day trader has a trading system developed based on his assumptions and research in the markets, each professional day trader has a market identified. He has to do a detailed research in the markets and find out the ideas for successful trading. These ideas are then formulated into hypothesis which is tested and a system is designed based on it. This system gives you desired signals whenever a predefined event occurs. This signal becomes the base for your trading decision. This hypostasis is revisited over a period of time and the system is updated in the light of the changes taking place. A successful day trader needs to define a correct trading system for himself first.

Success in day trading is all about cutting losses down and making profits higher. One, major key is protecting you pay in account. A negative balance in you pay in signifies failure in the market. So a successful day trader has to compulsorily manage his losses effectively. A good trader needs to have a market anticipation skill that guides him to the decision. I must confess that a lot of successful trading decision is based on the gut feeling of the trader. Over a period of time, the subconscious mind of the trader starts becoming activated and gives subtle signals to him. He needs to believe on this gut feeling. However, the importance of a good fund management skill cannot be discounted. Also, after designing a trading system, the day trader should avoid curve fitting. Above all, day trader needs to plan the trade but more importantly, trade the plan.

Lastly, as a professional trader, one needs to be positive for next trade, irrespective of the output in the last trade. Fear of the trade needs to be absent.

Position Traders

A position trader might make one trading decision and then hold that position for days, weeks or months. Position traders are less concerned with minor fluctuations and are more focused on long-term trends and market forces. Public traders and proprietary traders are often position traders.

With this method, you accumulate more and more of a particular trade over time. To start, pre-determine your trades by doing economic, accounting, financial, and technical chart research. Consult other traders to see what they are thinking. You might speak with your full-service broker to see what his investment bank's research department thinks. Then, use computer charts showing hourly and daily price movements, not five- and thirty second price movements. Make a case for the trade and start building it: this is your position.

Caution As the trade sells off and moves lower, you buy more, using the adage buy on the dips. In the end, sell off your position at the highest possible range of its long-term movement.

9.1.4 Basis of Trading

The NEAT F&O system supports an order driven market, wherein orders match automatically. Order matching is essentially on the basis of security, its price, time and quantity. All quantity fields are in units and price in rupees. The exchange notifies the regular lot size and tick size for

Notes

each of the contracts traded on this segment from time to time. When any order enters the trading system, it is an active order. It tries to find a match on the other side of the book. If it finds a match, a trade is generated.

Caution If it does not find a match, the order becomes passive and goes and sits in the respective outstanding order book in the system.

Self Assessment

Fill in the blanks:

1. The futures & options trading system of NSE, called ..... trading system.
2. Trading members can trade either on their own account or on behalf of their clients including .....
3. Clearing members are members of .....
4. A ..... clearing member is a clearing member who is not a trading member.
5. A participant is a client of trading members like it .....
6. ..... attempt to buy at the bid price and sell at the ask price, offsetting their trades within seconds of making the original trade.
7. A ..... might make one trading decision and then hold that position for days, weeks or months.

9.2 Corporate Hierarchy

In the F&O trading software, a trading member has the facility of defining a hierarchy amongst users of the system. This hierarchy comprises corporate manager, branch manager, dealer and admin.

- ***Corporate manager:*** The term is assigned to a user placed at the highest level in a trading firm. Such a user can perform all the functions such as order and trade related activities of all users, view net position of all dealers and at all clients level, can receive end of day consolidated trade and order reports dealer wise for all branches of the trading member firm and also all dealers of the firm. Only a corporate manager can sign off any user and also define exposure limits for the branches of the firm and its dealers.
- ***Branch manager:*** This term is assigned to a user who is placed under the corporate manager. Such a user can perform and view order and trade related activities for all dealers under that branch.
- ***Dealer:*** Dealers are users at the bottom of the hierarchy. A Dealer can perform view order and trade related activities only for oneself and does not have access to information on other dealers under either the same branch or other branches.
- ***Admin:*** Another user type, 'Admin' is provided to every trading member along with the corporate manager user. This user type facilitates the trading members and the clearing members to receive and capture on a real-time basis all the trades, exercise requests and give up requests of all the users under him. The clearing members can receive and capture all the above information on a real time basis for the members and participants linked to him.

Notes

All this information is written to comma separated files which can be accessed by any other program on a real time basis in a read only mode. This however does not affect the online data capture process. Besides this the admin users can take online backup, view and upload net position, view previous trades, view give-up screens and exercise request for all the users (corporate managers, branch managers and dealers) belonging to or linked to the member.

Did u know? The 'Admin' user can also view the relevant messages for trades, exercise and give up requests in the message area. However, 'Admin' user cannot put any orders or modify & cancel them.

A brief description of the activities of each member is given below:

- ***Clearing member corporate manager:*** Can view outstanding orders, previous trades and net position of his client trading members by putting the TM ID (Trading member identification) and leaving the branch ID and dealer ID blank.
- ***Clearing member and trading member corporate manager:*** Can view:
  - Outstanding orders, previous trades and net position of his client trading members by putting the TM ID and leaving the branch ID and the dealer ID blank.
  - Outstanding orders, previous trades and net positions entered for himself by entering his own TM ID, branch ID and user ID. This is his default screen.
  - Outstanding orders, previous trades and net position entered for his branch by entering his TM ID and branch ID fields.
  - Outstanding orders, previous trades, and net positions entered for any of his users/ dealers by entering his TM ID, branch ID and user ID fields.
- ***Clearing member and trading member dealer:*** Can only view requests entered by him.
- ***Trading member corporate manager:*** Can view:
  - Outstanding requests and activity log for requests entered by him by entering his own branch and user IDs. This is his default screen.
  - Outstanding requests entered by his dealers and/or branch managers by either entering the branch and/or user IDs or leaving them blank.
- ***Trading member branch manager:*** He can view:
  - Outstanding requests and activity log for requests entered by him by entering his own branch and user IDs. This is his default screen.
  - Outstanding requests entered by his users either by filling the user ID field with a specific user or leaving the user ID field blank.
- ***Trading member dealer:*** He can only view requests entered by him.

Task "Future trading can be done on stocks as well as on Indices like IT index, Auto index, Pharma index etc." Discuss.

Notes

9.2.1 Client Broker Relationship in Derivative Segment

A trading member must ensure compliance particularly with relation to the following while dealing with clients:

- Filling of 'Know Your Client' form
- Execution of Client Broker agreement
- Bring risk factors to the knowledge of client by getting acknowledgement of client on risk disclosure document
- Timely execution of orders as per the instruction of clients in respective client codes
- Collection of adequate margins from the client
- Maintaining separate client bank account for the segregation of client money
- Timely issue of contract notes as per the prescribed format to the client
- Ensuring timely pay-in and pay-out of funds to and from the clients
- Resolving complaint of clients if any at the earliest
- Avoiding receipt and payment of cash and deal only through account payee cheques
- Sending the periodical statement of accounts to clients
- Not charging excess brokerage
- Maintaining unique client code as per the regulations

Self Assessment

State whether the following statements are true or false:

8. Corporate hierarchy comprises corporate manager, branch manager, dealer and admin.
9. Dealer is a term assigned to a user who is placed under the corporate manager.
10. Branch manager does not have access to information on other dealers under either the same branch or other branches.
11. Clearing member corporate manager can view outstanding orders, previous trades and net position of his client.
12. A trading member must ensure compliance particularly with relation to filling of 'Know Your Client' form.
13. A trading member must ensure compliance particularly with relation to not charging excess brokerage.

9.3 Order Types and Conditions

The system allows the trading members to enter orders with various conditions attached to them as per their requirements. These conditions are broadly divided into the following categories:

1. Time conditions:
   (a) *Day order:* A day order, as the name suggests is an order which is valid for the day on which it is entered. If the order is not executed during the day, the system cancels the order automatically at the end of the day.
   (b) *Immediate or Cancel (IOC):* An IOC order allows the user to buy or sell a contract as soon as the order is released into the system, failing which the order is cancelled from the system. Partial match is possible for the order.

Notes

Notes Unmatched portion of the order is cancelled immediately.

2. Price condition:

   (a) *Stop-loss:* This facility allows the user to release an order into the system, after the market price of the security reaches or crosses a threshold price.

   Example: If for stop-loss buy order, the trigger is 1027.00, the limit price is 1030.00 and the market (last traded) price is 1023.00, then this order is released into the system once the market price reaches or exceeds 1027.00. This order is added to the regular lot book with time of triggering as the time stamp, as a limit order of 1030.00. For the stop-loss sell order, the trigger price has to be greater than the limit price.

3. Other conditions:

   (a) *Market price:* Market orders are orders for which no price is specified at the time the order is entered (i.e. price is market price). For such orders, the system determines the price.

   (b) *Trigger price:* Price at which an order gets triggered from the stop-loss book.

   (c) *Limit price:* Price of the orders after triggering from stop-loss book.

   (d) *Pro:* Pro means that the orders are entered on the trading member's own account.

   (e) *Cli:* Cli means that the trading member enters the orders on behalf of a client.

Self Assessment

Fill in the blanks:

14. A ……..is an order which is valid for the day on which it is entered.

15. ……is the price at which an order gets triggered from the stop-loss book.

Case Study

Trading in Reliance Industries Ltd. (RIL)

The Reliance Group is India's largest private sector enterprise, with businesses in the energy and materials value chain. Group's annual revenues are in excess of US$ 66 billion. The flagship company, Reliance Industries Limited, is a Fortune Global 500 company and is the largest private sector company in India. RIL is trading at ₹ 720 levels, Mr. X are bullish in the long term, but wants to hedge himself from the fall in cash strategy goes wrong. He will buy 250 shares of RIL from the cash market @ ₹ 720 and buy 1700 Put Option @ ₹ 10 as premium. The lot size of RIL is 250.

Question:

Find out the net investment and net profit/net loss in the following case:

Case 1: If RIL dips to ₹ 690

Case 2: If RIL closes at ₹ 720

Case 3: If RIL rises up to ₹ 750

Source: http://www.mydaytradingtutor.com/currency-trading-examples.htm

Notes

9.4 Summary

- Futures are useful to the market participants only if futures prices reflect information about the prices of the underlying assets.
- The futures & options trading system of NSE, called NEAT-F&O trading system, provides a fully automated screen-based trading for Nifty futures & options and stock futures & options on a nationwide basis as well as an online monitoring and surveillance mechanism.
- There are four parties/entities in the trading system. They are Trading members, clearing members, professional clearing members and participants.
- The market would not be possible without the participation of traders, or speculators, who provide a fluid market of buyers and sellers.
- A scalper trades in and out of the market many times during the day, hoping to make a small profit on a heavy volume of trades.
- A day trader is similar to a scalper in that he or she also typically does not hold positions overnight and is an active trader during the trading day.
- A position trader might make one trading decision and then hold that position for days, weeks or months.
- In the F&O trading software, a trading member has the facility of defining a hierarchy amongst users of the system. This hierarchy comprises corporate manager, branch manager, dealer and admin.
- Clearing member corporate manager can view outstanding orders, previous trades and net position of his client trading members by putting the TM ID (Trading member identification) and leaving the branch ID and dealer ID blank.
- Trading member branch manager can view outstanding requests and activity log for requests entered by him by entering his own branch and user IDs. This is his default screen.

9.5 Keywords

- ***Day order:*** A day order, as the name suggests is an order which is valid for the day on which it is entered.
- ***Day Traders***: A day trader is similar to a scalper in that he or she also typically does not hold positions overnight and is an active trader during the trading day.
- ***Immediate or Cancel (IOC):*** An IOC order allows the user to buy or sell a contract as soon as the order is released into the system, failing which the order is cancelled from the system.
- ***Leverage:*** Leverage is the ability of a trader to control large dollar amounts of a commodity with a comparatively small amount of capital.
- ***Market Makers:*** Market makers give liquidity to the market, constantly providing both a bid (expression to buy) and an offer (expression to sell).
- ***Market Price:*** Market orders are orders for which no price is specified at the time the order is entered (i.e. price is market price).
- ***Market Risk:*** Market risk is the possibility that the value of the derivative will change.
- ***Market Watch Window:*** The market watch window is the third window from the top of the screen which is always visible to the user.

Notes

- ***NEAT-F&O Trading System:*** The futures & options trading system of NSE are called NEAT-F&O trading system.
- ***Participants:*** A participants is a client of trading members like it financial institutions.
- ***Scalpers***: A scalper trades in and out of the market many times during the day, hoping to make a small profit on a heavy volume of trades.

9.6 Review Questions

1. Briefly explain futures & options trading system.
2. Write a note on NEAT-F&O trading system.
3. "NEAT-F&O trading system supports an order driven market and provides complete transparency of trading operations." Elaborate.
4. Clearing members carry out risk management activities and confirmation/inquiry of trades through the trading system. What are the other parties of trading system?
5. Why do we need to trade a futures contract?
6. Write about the four parties/entities in the trading system.
7. Describe about the various types of traders.
8. What is a scalper's and day trader?
9. Write down the difference between scalper's and day trader.
10. "In the F&O trading software, a trading member has the facility of defining a hierarchy amongst users of the system." Discuss.
11. Explain the client broker relationship in derivative segment.
12. "The system allows the trading members to enter orders with various conditions attached to them as per their requirements." Elaborate.

Answers: Self Assessment

1.	NEAT-F&O	2.	Participants
3.	NSCCL	4.	Professional
5.	Financial institutions	6.	Scalpers
7.	Position trader	8.	True
9.	False	10.	False
11.	True	12.	True
13.	True	14.	Day order
15.	Trigger price		

9.7 Further Readings

Books

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Notes

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X, P Hartmann and C Mayer (eds). *Handbook of European financial markets and institutions.* Oxford University Press. Oxford. UK.

Online links

http://www.tradersedgeindia.com/faqsFO.htm

http://www.nseindia.com/content/fo/fo_contractspecs.htm

http://www.trade-ideas.com/Traders_Position.html

www.nse.org

http://www.nseindia.com/education/content/module_ncfm.htm

Notes

Unit 10: The Trader Workstation

CONTENTS

Objectives

Introduction

10.1 About Trader Workstation

10.2 The Market Watch Window

10.2.1 'Symbols' Window

10.2.2 'Popup Prices' Window

10.2.3 Ticks

10.2.4 Trading

10.3 Inquiry Window

10.4 Placing Orders on the Trading System

10.4.1 Market Spread/Combination Order Entry

10.4.2 Basket Trading

10.5 Summary

10.6 Keywords

10.7 Review Questions

10.8 Further Readings

Objectives

After studying this unit, you should be able to:

- State the meaning and function of trader workstation;
- Discuss about the market watch window;
- Describe the inquiry window;
- Explain placing orders on the trading system.

Introduction

In the previous unit, you have studied about the trading system of futures and options contracts. We also discussed about the entities in the trading system, basis of trading, corporate hierarchy, client broker relationship in derivative segment, order types and conditions in trading system. This unit will helps you to understand about the trader workstation. We will also learn about the market watch window and inquiry window. The various sections and sub-section of this unit will also explain 'symbols' window, 'popup prices' window, ticks and trading in market watch. Further, we will end up the unit with discussion on placing orders on the trading system. To make the learning easier, we will take the help of globally recognised best practices.

The next best way to familiarise oneself with the screen and its various segments is to actually spend some time studying a live screen. In this unit we shall restrict ourselves to understanding just two segments of the workstation screen, the market watch window and the inquiry window.

Notes

10.1 About Trader Workstation

The trader workstation is the terminal from which the member accesses the trading system. Each trader has a unique identification by way of Trading Member ID and User ID through which he is able to log on to the system for trading or inquiry purposes. A member can have several user IDs allotted to him by which he can have more than one employee using the system concurrently.

The Exchange may also allow a Trading Member to set up a network of dealers in different cities all of whom are provided a connection to the NSE central computer. A Trading Member can define a hierarchy of users of the system with the Corporate Manager at the top followed by the Branch Manager and Dealers.

The following windows are displayed on the trader workstation screen:

1. ***Title bar:*** The title bar displays the current time, Trading system name and date.
2. ***Ticker window:*** The ticker displays information about a trade as and when it takes place. The user has the option to set-up the securities which appear in the ticker.
3. ***Toolbar:*** A window with different icons which provides quick access to various functions such as Market By Order, Market By Price, Market Movement, Market Inquiry, Auction Inquiry, Snap Quote, Market Watch, Buy order entry, Sell order entry, Order Modification, Order Cancellation, Outstanding Orders, Order Status, Activity Log, Previous Trades, Net Position, Online Backup, Supplementary Menu, Security List and Help. All these functions are also available on the keyboard.
4. ***Market watch window:*** The Market Watch window is the main area of focus for a Trading Member. The purpose of Market Watch is to view market information of pre-selected securities that are of interest to the Trading Member.

   To monitor various securities, the trading member can set them up by typing the Security Descriptor consisting of a Symbol field and a Series field. Securities can also be set up by invoking the Security List and selecting the securities from the window. The Symbol field incorporates the Company name and the Series field captures the segment/instrument type. A third field indicates the market type.

   Example: Company (Symbol): ACC

   Instrument type (Series): EQ

   Market Type: N

   For each security in the Market Watch window, market information is dynamically updated on a real time basis. The market information displayed is for the current best price orders available in the regular lot book. For each security, the corporate action indicator (e.g., Ex or cum dividend, interest, rights etc.), the total buy order quantity for the best buy price, best sell price, total sell order quantity for the best sell price, the Last Traded Price (LTP), the last traded price change indicator ('+' if last traded price is better than the previous last traded price and '-' if it is worse) and the no delivery indicators are displayed.

Notes If the security is suspended, "SUSPENDED" appears in front of the security.

Notes

5. ***On line Index and Index Inquiry:*** With every trade in a security participating in Index, the user has the information on the current value of the Nifty. This value is displayed at the extreme right hand corner of the ticker window. Index Inquiry gives information on Close, Open, High, Low and current index values at the time of invoking this inquiry screen.

6. ***Inquiry window:*** In this window, the inquiries such as Market by Order, Market by Price, Previous Trades, Outstanding Orders, Activity Log, Order Status and Market Inquiry can be viewed.

7. ***Snap quote:*** The Snap Quote feature allows a Trading Member to get instantaneous market information on any desired security. This is normally used for securities that are not already on display in the Market Watch window. The information presented is the same as that of Market Watch window.

8. ***Order/trade window:*** Order entry mechanisms enable the Trading Member to place orders in the market.

Notes The system will request re-confirmation of an order so that the user is cautioned before the order is finally released into the market.

Caution Orders once placed on the system can be modified or cancelled till they are matched. Once orders are matched they cannot be modified or cancelled.

There is a facility to generate online order/trade confirmation slips as soon as an order is placed or a trading is done. The order confirmation slip contains among other things, order no., security name, price, quantity, order conditions like disclosed or minimum fill quantity etc. The trade confirmation slip contains the order and trade no., date, trade time, price and quantity traded, amount etc. Orders and trades are identified and linked by unique numbers so that the investor can check his order and trade details.

9. ***System message window:*** This window is used to view messages from the Exchange to all specific Trading Members.

10. ***Supplementary Menu:*** Some of the supplementary features in the NEAT system are:

    (a) *On line back up*: An on line back up facility is provided which the user can invoke to take a back up of all order and trade related information. There is an option to copy the file to any drive of the computer or on a floppy diskette. Trading members find this convenient in their back office work.

    (b) *Off Line Order Entry:* A member is able to make an order entry in the batch mode.

Self Assessment

Fill in the blanks:

1. The …… is the terminal from which the member accesses the trading system.

2. The …… displays information about a trade as and when it takes place.

Notes

3. The purpose of Market Watch is to view market information of …… securities that are of interest to the Trading Member.
4. …… gives information on Close, Open, High, Low and current index values at the time of invoking this inquiry screen.
5. The ……feature allows a Trading Member to get instantaneous market information on any desired security.

10.2 The Market Watch Window

The 'Market Watch' window contains a list of quotes, which are constantly updated. The market watch window is the third window from the top of the screen which is always visible to the user. The purpose of market watch is to allow continuous monitoring of contracts or securities that are of specific interest to the user. It displays trading information for contracts selected by the user. The user also gets broadcast of all the cash market securities on the screen. This function also will be available if the user selects the relevant securities for display on the market watch screen. Display of trading information related to cash market securities will be on "Read only" format, i.e. the dealer can only view the information on cash market but, cannot trade in them through the system.

Notes This is the main window from the dealer's perspective.

A broker review market information of pre-selected securities that are of interest to him/her. To monitor various securities, the broker has two options:

- Key in the security descriptor that is a symbol and a series field
- Invoking the security list and then selecting the securities

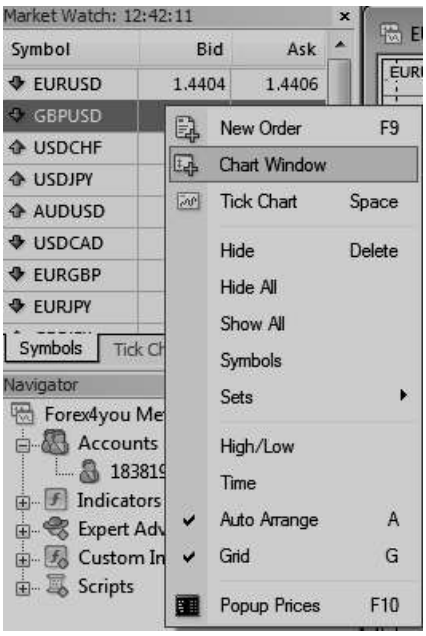
Each line in the 'Market Watch' window corresponds to a specific market instrument, and has the following fields:

Table 10.1: Fields in Market Watch Window

Field	Description
Symbol	The symbol for the market instrument
Bid	The current bid price
Ask	The current ask price
Update Time	The last time the quote was updated
Maximum	The highest price so far in the day
Minimum	The lowest price so far in the day

Notes

Figure 10.1: Fields in Market Watch Window



The 'Market Watch' window has a context menu, which can be accessed by right-clicking on a symbol. This menu includes the items shown below:

Table 10.2: Context Menu of Market Watch Window

Menu Item	Shortcut	Description
New Order	F9	Open a new order for the selected symbol. You can find more information about creating orders here.
Chart Window		Open a new chart window for the selected symbol. You can find more information about creating charts here.
Tick Chart	Space	Open a tick chart directly in the 'Market Watch' window. The same chart also appears on the 'Tick Chart' tab.
Hide	Delete	Delete the symbol from the list; this is recommended for unused symbols. Symbols with open positions, pending orders or open charts windows can't be deleted.
Hide All		Delete all the symbols from the list. Symbols with open positions, pending orders or open charts windows aren't deleted.
Show All		Add all available symbols to the list. You will receive quotes for all these symbols, and they will be updated continuously.
Symbols		Open the 'Symbols' window, which shows all available symbols grouped by type.
Sets		Open a sub-menu containing symbol sets. This lets you switch easily between different symbol sets. You can store the current symbol set that is displayed in the 'Market Watch' window, select sets that have been stored previously, and delete sets.
High/Low		Display the day's high and low prices.
Time		Display the last time that quotes were updated.
Auto Arrange	A	Automatically adjust columns when the window is resized.
Grid	G	Display grid lines between columns.
Popup Prices	F10	Open a separate popup window containing quotes.

Notes

10.2.1 'Symbols' Window

This window lists all the available symbols. You can access the context menu for a symbol by right-clicking on that symbol. This context menu includes the following items.

Table 10.3: Context Menu for a Symbol

Menu item	Description
Show Symbol	Add the symbol to the 'Market Watch' screen.
Hide Symbol	Delete the symbol from the 'Market Watch' screen.
Properties	Display detailed information about the symbol.

Notes If there are open positions or pending orders in a symbol, or its chart is open, it cannot be hidden from the "Market Watch" window.

If a symbol is hidden from the "Market Watch" window, MQL5 programs and the strategy tester will not be able to use information by it.

Prices in the "Market Watch" window have different colours:

Blue — if the current price is higher than the previous one;

Red — if the current price is lower than the previous one;

Grey — if the price hasn't changed for the last 15 seconds.

If the depth of market is available for the symbol and Last prices are transmitted for it then the colour is determined by Last price. Otherwise the colour is determined by Bid price.

Fast Adding of Symbols

In order to quickly add a symbol to the "Market Watch" window you should double-click with the left mouse button anywhere outside the list of turned on symbols. After that a field where you should type a symbol name will appear:

Then you should press the "Enter" key. As soon as you do it, the symbol will be added to the "Market Watch" window.

10.2.2 'Popup Prices' Window

When you open this window, it contains the same set of symbols as are displayed in the main 'Market Watch' window. However, if you modify the 'Market Watch' window, the 'Popup Prices' window is not affected. This means you can work with more than one symbol set at the same time.

Notes

Figure 10.2: Popup Prices

Popup prices

Symbol	Bid	Ask
EURUSD	1.40992	1.41005
GBPUSD	1.6527	1.6530
USDCHF	1.0785	1.0789
USDJPY	94.74	94.77
USDCAD	1.1071	1.1075
AUDUSD	0.8225	0.8228
AUDNZD	1.2221	1.2233
AUDCAD	0.9103	0.9113
AUDCHF	0.8868	0.8876
AUDJPY	77.90	77.96
NZDUSD	0.6724	0.6734

Source: http://www.metatrader5.com/en/terminal/help/market_watch/popup_prices

You can carry out trading operations in this window by double-clicking on a symbol with the left mouse button. There's also a context menu, which lets you do the following:

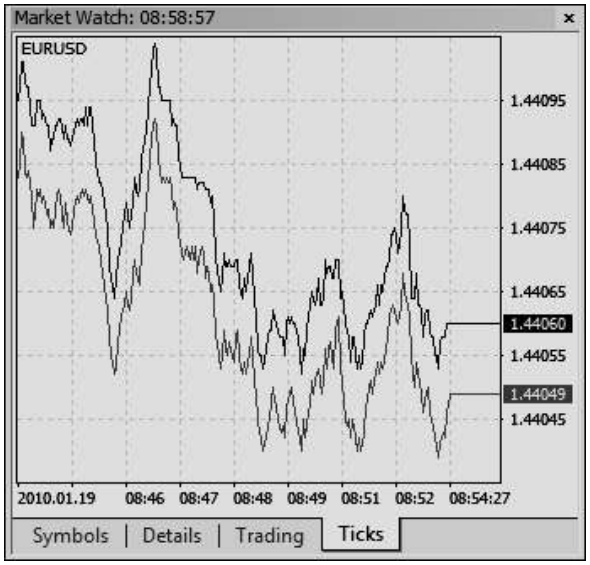
- Change the data which is displayed
- Put the window in full-screen mode
- Display the window on top of other windows

Task "Each line in the 'Market Watch' window corresponds to a specific market instrument." Discuss.

10.2.3 Ticks

This tab of the Market Watch window allows viewing tick charts inside the Market Watch window:

Figure 10.3: Tick Chart



Source: http://www.metatrader5.com/en/terminal/help/market_watch/tick_chart

Notes

The context menu of this tab allows executing the following commands:

- *New Order:* This open the window to create an order for the selected symbol;
- *Chart Window:* This open the chart window of the selected symbol;
- *Auto Scroll:* This enable/disable auto scrolling of a chart to its beginning when new ticks come;
- *Crosshair:* This enable/disable the "Crosshair" mode for the cursor. This mode allows showing coordinates of a selected point in the tick chart window;
- *Bid Line:* This show/hide the Bid line (red) in the chart;
- *Ask Line:* This show/hide the Ask line (blue) in the chart;
- *Last Price Line:* This show/hide the line of last price of the executed trade of a stock symbol (green line);
- *Grid:* This show/hide grid in the chart.

Caution

- The client terminal stores up to 2000 last ticks for each symbol.
- The tick chart will be cleared and then redrawn in case you delete and re-add a symbol in the "Market Watch" window. Previous tick data can also be cleared for a correct scaling of the tick chart (if current prices differ from previous prices significantly).

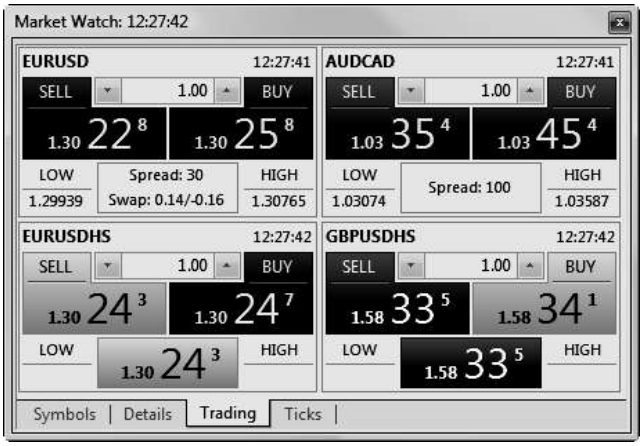
10.2.4 Trading

This tab allows performing trade operations with a single mouse click. In other words, when a trader presses the "Sell" or "Buy" button, a request to perform a trade operation of a specified volume is instantly sent to the server. Trading in this mode is available if:

- The "One click trading" option is enabled in the terminal settings;
- Execution type of the selected symbol is "Instant", "Market" or "Execution".

Did u know? In other case, the buttons of buying and selling will open the window of creating an order.

Figure 10.4: Market Watch Trading



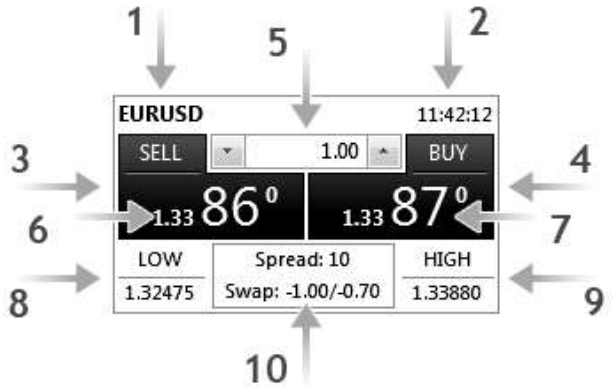
Source: http://www.metatrader5.com/en/terminal/help/market_watch/market_watch_trading

Notes

This window contains panels for performing trade operations by different symbols. The set of symbols displayed in it is the same as one in the "Symbols" tab; it can be adjusted using the "Symbols" command in the context menu.

Elements of the Trade Window

Figure 10.5: One Click Trading



Source: http://www.metatrader5.com/en/terminal/help/market_watch/market_watch_trading

The trade window of each symbol contains the following elements:

1. Symbol name.
2. Time of last quote arrival.
3. Command for making a sell trade.
4. Command for making a buy trade.
5. The field of managing the volume. The volume can be specified using the arrows located to the left and to the right of the field, or using a keyboard.
6. Current bid price.
7. Current ask price.
8. Lowest Bid price for the current day (Bid Low).
9. Highest Ask price for the current day (Ask High).
10. Current spread and swap for short and long positions. If the last price at which a trade was executed is available for the symbol, it is displayed instead of the spread and the swap.

Caution Be careful, once the "Sell" or "Buy" button is pressed, the corresponding request for buying or selling the specified amount of a selected symbol is immediately sent to the server without any additional confirmation.

The execution of the commands mentioned above doesn't always result in performing of the corresponding deal. The reason can be a re-quote, refusal of a brokerage company, etc. In this case, the corresponding message appears in the journal of the terminal.

Notes

Self Assessment

State whether the following statements are true or false:

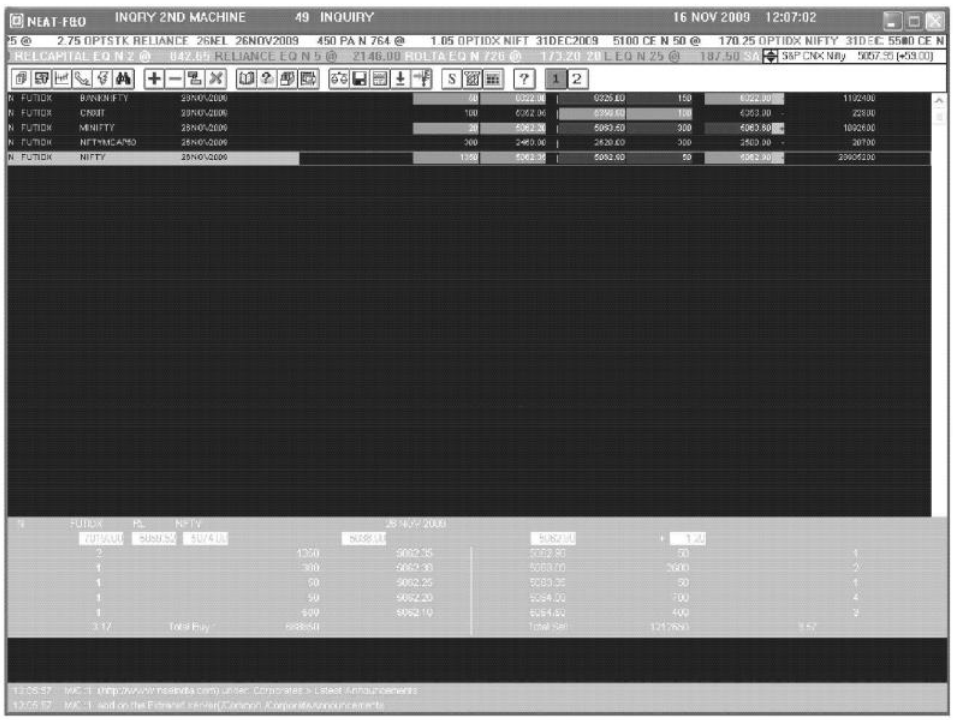
6. Display of trading information related to cash market securities will be on "Read only" format.
7. If there are open positions or pending orders in a symbol, or its chart is open, it cannot be hidden from the "Market Watch" window.
8. If the depth of market is available for the symbol and Last prices are transmitted for it then the colour is determined by Bid price.
9. If you modify the 'Market Watch' window, the 'Popup Prices' window is not affected.
10. When a trader presses the "Sell" or "Buy" button, a request to perform a trade operation of a specified volume is instantly sent to the server.

10.3 Inquiry Window

The inquiry window enables the user to view information such as:

1. ***Market by price (MBP):*** The purpose of the MBP is to enable the user to view passive orders in the market aggregated at each price and are displayed in order of best prices. The window can be invoked by pressing the [F6] key. If a particular contract or security is selected, the details of the selected contract or security can be seen on this screen. Figure 10.6 gives the screen shot of the Market by Price window in the NEAT F&O.

Figure 10.6: Market by Price in NEAT F&O

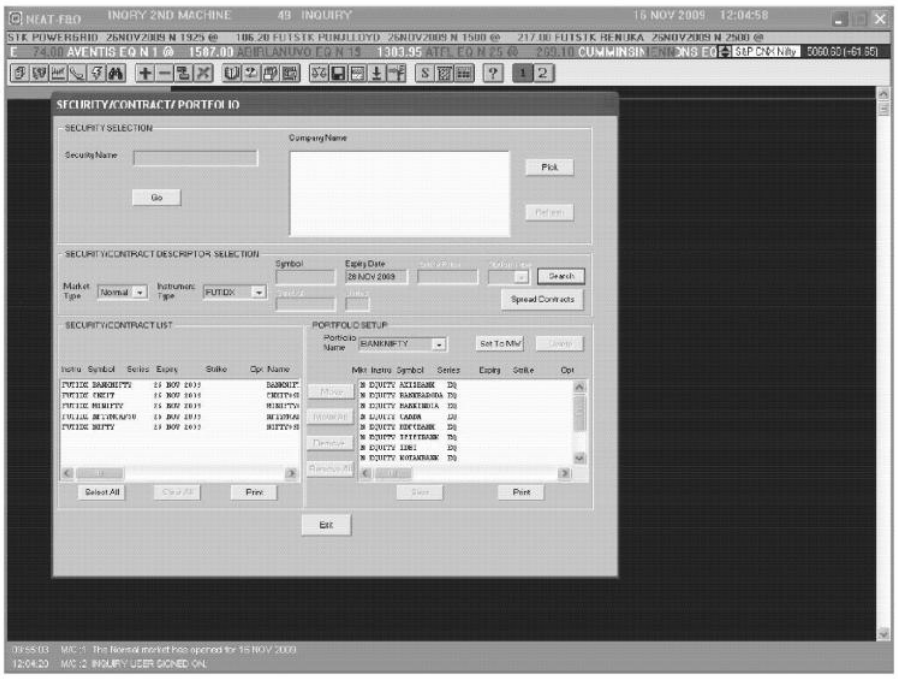


2. ***Market inquiry (MI):*** The market inquiry screen can be invoked by using the [F11] key. If a particular contract or security is selected, the details of the selected contract or selected

Notes

security defaults in the selection screen or else the current position in the market watch defaults. The first line for the screen gives the Instrument type, symbol, expiry, contract status, total traded quantity, life time high and life time low. The second line displays the closing price, open price, high price, low price, last traded price and indicator for net change from closing price. The third line displays the last traded quantity, last traded time and the last traded date. The fourth line displays the closing open interest, the opening open interest, day high open interest, day low open interest, current open interest, life time high open interest, life time low open interest and net change from closing open interest. The fifth line display very important information, namely the carrying cost in percentage terms. Figure 10.7 shows the Market Inquiry screen of the NEAT F&O.

Figure 10.7: Security/contract/portfolio entry screen in NEAT F&O



3. ***Previous Trades (PT):*** The purpose of this window is to provide information to users for their own trade.

4. ***Outstanding Orders (OO):*** The purpose of Outstanding Orders is to enable a Trading Member to view his/her own outstanding buy or sell orders for a security. An outstanding order will be an order that was entered by the user, but is not yet completely traded or cancelled.

5. ***Activity Log (AL):*** The Activity Log shows the activities that have been performed on any order of the Trading Member such as whether the order has been traded against fully or partially, it has been modified or has been cancelled. It displays information only of those orders in which some activity has taken place. It does not display orders, which have entered the books but have not been matched (fully or partially) or modified or cancelled.

6. ***Order Status (OS):*** Order Status enables the user to look into the status of a specific order. Current status of the order and other order details are displayed. In case the order is traded, the trade details are also displayed.

7. ***Market Movement (MM):*** The Market Movement screen provides information to the user regarding the movement of a security for the current day. It gives details of the movement

Notes

of the scrip for a time interval. The details include total buy and sell order quantity value, Open, High, Low, Last traded price etc.

8. *Most Active Securities:* This screen gives a list of the securities with the highest traded value during the day and the quantity traded for each of them.

9. *Net Position:* This functionality enables the user to interactively view his net position for all securities in which he has traded.

Self Assessment

State whether the following statements are true or false:

11. The purpose of the market inquiry is to enable the user to view passive orders in the market aggregated at each price and are displayed in order of best prices.

12. The market inquiry screen can be invoked by using the [F9] key.

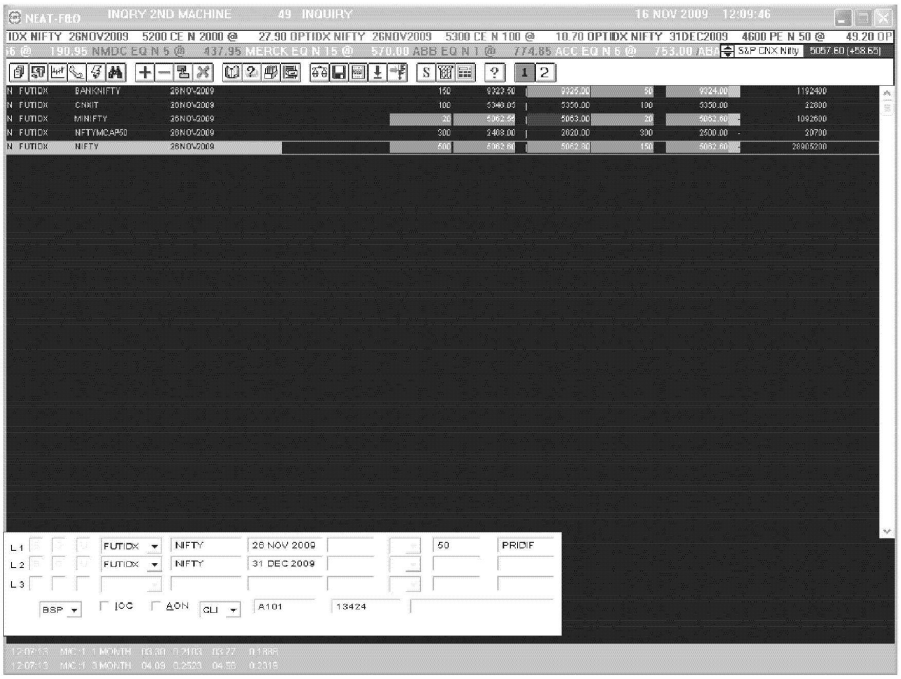
13. Order Status enables the user to look into the status of a specific order.

10.4 Placing Orders on the Trading System

For both the futures and the options market, while entering orders on the trading system, members are required to identify orders as being proprietary or client order. Proprietary orders should be identified as 'Pro, and those of clients should be identified as 'Cli'. Apart from this, in the case of 'Cli' trades, the client account number should also be provided.

The futures market is a zero sum game i.e. the total number of long in any contract always equals the total number of short in any contract. The total number of outstanding contracts (long/sight) at any point in time is called the "Open interest". This Open interest figure is a good indicator of the liquidity in every contract. Based on studies carried out in international exchanges, it is found that open interest is maximum in near month expiry contracts.

Figure 10.8: Market Spread/Combination Order Entry



Notes

10.4.1 Market Spread/Combination Order Entry

The NEAT F&O trading system also enables to enter spread/combination trades. Figure 10.8 shows the spread/combination screen. This enables the user to input two or three orders simultaneously into the market. These orders will have the condition attached to it that unless and until the whole batch of orders finds a counter match, they shall not be traded. This facilitates spread and combination trading strategies with minimum price risk. The combinations orders are traded with an IOC attribute whereas spread orders are traded with 'day' order attribute.

Caselet

Market Spread and Arbitrage

Mr. Nitin Joshi is an arbitrager in the commodity market. Mr. Joshi enters into a commodity futures transaction when he sees any risk less profit opportunity in the market. In May 2011, he implements cash and carry arbitrage transaction in silver in the following manner:

In May 2011, Mr. Nitin Joshi buys 30 MT of turmeric at the spot price of ₹ 1950 per quintal by borrowing ₹ 585000 @ 10% p.a for two months (at simple interest) and simultaneously sells 3 turmeric June futures contract of 10 MT each at a price of ₹ 1975 per quintal. On the maturity of the contract, he takes possession of turmeric for one month.

Then after a month, he closes out the futures position on the contract expiration day by giving delivery of the turmeric purchased in May 2011.

The transaction yields a profit of ₹ 2625. {592500 – (₹585000 + 4875 (interest) }

From the amount of ₹ 592500 in hand, Mr. Joshi returns the borrowed amount of ₹ 585000 along with an interest of ₹ 4875. He also incurs a storage cost of ₹ 1000 on 30 MT. Mr. Nitin Joshi earns an arbitrage profit of ₹ 1625 after deducting interest payments and storage cost.

Source: Kulkarni B. (2011). "Commodity Markets & Derivatives". Excel Books.

10.4.2 Basket Trading

In order to provide a facility for easy arbitrage between futures and cash markets, NSE introduced basket-trading facility. This enables the generation of portfolio offline order files in the derivatives trading system and its execution in the cash segment. A trading member can buy or sell a portfolio through a single order, once he determines its size. The system automatically works out the quantity of each security to be bought or sold in proportion to their weights in the portfolio. Figure 10.9 shows the basket trading screen.

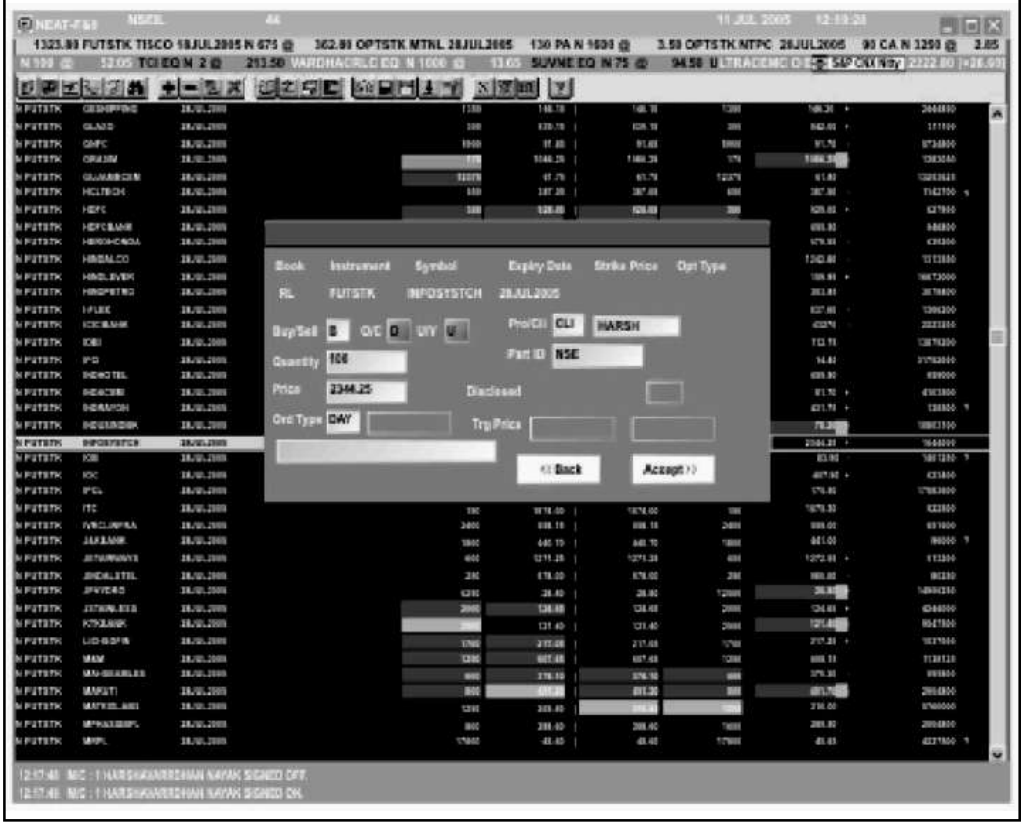
Self Assessment

Fill in the blanks:

14. Proprietary orders should be identified as……., and those of clients should be identified as ……..
15. The futures market is a zero sum game i.e. the total number of long in any contract always equals the total number of ……in any contract.

Notes

Figure 10.9: Portfolio Office Order Entry for Basket Trades



Case Study

A Refiner Fixing his Margins through a Simple 1:1 Crack Spread

In January, a refiner reviews his crude oil acquisition strategy and his potential distillate margins for the spring. He finds that as per his research, the distillate prices are expected to be strong. He plans a two-month crude to distillate spread strategy. This will allow him to lock in his margins.

In May, the spread between August crude ($134 per barrel) and September heating oil ($3.8786 per gallon or $162.9012 per barrel) presents what he believes to be a favourable $28.9012 per barrel.

The refiner sells the Aug/Sept crude-to-heating oil spread, thereby locking in the $28.9012/bbl. margin. He does this by buying August crude oil futures at $134/bbl. and selling September heating oil futures at $3.8786/gal.

In July, he purchases the crude oil at $137/bbl in the cash market for refining into products. He also sells heating oil from his existing stock in the cash market for $3.8985/gal. or 163.7370/bbl. His net gain in the cash market is therefore $26.7370/bbl. (163.7370/bbl.-137/bbl)

Contd....

Notes

To complete the spread transaction, the refiner buys back the crack spread by first repurchasing the heating oil futures he sold in May. Since they now trade at 163.7370/bbl, they cost him 84¢/bbl. more than he sold them for. But he also sells back the crude oil futures he purchased in May. Since crude oil futures are trading at $137/bbl. It earns him $3.00/bbl. more than he paid for them.

His gain on the spread is therefore $ 3.16. It is calculated as $3.00 gain on crude oil futures minus the 84¢ loss on heating oil futures. Had the refiner been unhedged, his margin would have been limited to a gain of $ 26.74 gain he had in the cash market. Instead, combined with that gain, his final net margin with the hedge is $28.9.

Table 1: Financial Impact of Cash and Futures

Month	Cash	Futures	Financial Impact from Cash	Financial Impact from Futures
May	-	Sell Crack Spread		
		Buy Aug Crude futures		($134.0000)
		Sell Sept heating oil Futures		$162.9012
		Gain / loss		**$28.9012**
July	Buy Crude oil @ $137/bbl		($137.0000)	
	Sell heating oil @163.7370		$163.7370	
	Net Gain/loss		**$26.7370**	
		Buy Crack Spread		
		Sell Aug Crude futures at $137		$137.0000
		Buy Sept heating oil futures at $163.7370		($163.7370)
		Gain / loss		**($26.7370)**
		Net futures Gain/loss		**$2.1642**
	Cash refining margin without hedge			
Final	Final net margin with hedge		**$28.9012**	

Question:

Analyse the case and write down the case facts.

Source: Kulkarni B. (2011). "*Commodity Markets & Derivatives*". Excel Books.

10.5 Summary

- The trader workstation is the terminal from which the member accesses the trading system. Each trader has a unique identification by way of Trading Member ID and User ID through which he is able to log on to the system for trading or inquiry purposes.

Notes

- A Trading Member can define a hierarchy of users of the system with the Corporate Manager at the top followed by the Branch Manager and Dealers.
- The 'Market Watch' window contains a list of quotes, which are constantly updated. The market watch window is the third window from the top of the screen which is always visible to the user.
- The 'Market Watch' window has a context menu, which can be accessed by right-clicking on a symbol.
- Prices in the "Market Watch" window have different colours.
- In order to quickly add a symbol to the "Market Watch" window you should double-click with the left mouse button anywhere outside the list of turned on symbols.
- When you open this window, it contains the same set of symbols as are displayed in the main 'Market Watch' window.
- Trading tab allows performing trade operations with a single mouse click. In other words, when a trader presses the "Sell" or "Buy" button, a request to perform a trade operation of a specified volume is instantly sent to the server.
- For both the futures and the options market, while entering orders on the trading system, members are required to identify orders as being proprietary or client order.
- The NEAT F&O trading system also enables to enter spread/combination trades. Figure 10.4 shows the spread/combination screen. This enables the user to input two or three orders simultaneously into the market.
- In order to provide a facility for easy arbitrage between futures and cash markets, NSE introduced basket-trading facility. This enables the generation of portfolio offline order files in the derivatives trading system and its execution in the cash segment.

10.6 Keywords

Basket Trading: This enables the generation of portfolio offline order files in the derivatives trading system and its execution in the cash segment.

Market by price (MBP): MBP enable the user to view passive orders in the market aggregated at each price and are displayed in order of best prices.

Market watch window: The Market Watch window is the main area of focus for a Trading Member.

***On line back up*:** An on line back up facility is provided which the user can invoke to take a back up of all order and trade related information.

Snap Quote: The Snap Quote feature allows a Trading Member to get instantaneous market information on any desired security.

Ticker Window: The ticker displays information about a trade as and when it takes place.

Ticks: This tab of the Market Watch window allows viewing tick charts inside the Market Watch window.

Title bar: The title bar displays the current time, Trading system name and date.

Trader Workstation: The trader workstation is the terminal from which the member accesses the trading system.

Notes

10.7 Review Questions

1. Briefly explain about trader workstation.
2. List the windows that are displayed on the trader workstation screen.
3. What is market watch window?
4. List down the fields in market watch window.
5. What is symbols window? Explain fast adding of symbols.
6. What is 'Popup Prices' window?
7. Explain the meaning and commands of ticks that context menu of this tab allows.
8. What is trading tab? What are the elements of the trade window?
9. Discuss about inquiry window. What information does inquiry window enables the user to view?
10. What id Proprietary and clients orders?
11. Discuss about market spread/combination order entry.
12. What is basket trading?

Answers: Self Assessment

1.	Trader workstation	2.	Ticker
3.	Pre-selected	4.	Index Inquiry
5.	Snap Quote	6.	True
7.	True	8.	False
9.	True	10.	True
11.	False	12.	False
13.	True	14.	'Pro, 'Cli'
15.	Short		

10.8 Further Readings

Books

Anderson, R W and K McKay (2008). *Derivatives markets*, in Freixas, X, P Hartmann and C Mayer (eds), *Handbook of European Financial Markets and Institutions*, Oxford University Press, Oxford, UK.

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Chance, Don M. *An Introduction to Derivatives*. Dryden Press. International Edition

Chew, Lilian. *Managing Derivative Risk*. John Wiley. New Jersey.

Derivatives Market NCFM Module (2007). National Stock Exchange India Limited Publications: Bombay.

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Gupta S.L. *Financial Derivatives.* Prentice Hall. New Delhi.

Jaynath Rama Varma (2007). *Derivatives and Risk Management* Tata McGraw Hill Publications: New Delhi: 2008

Online links

http://fxgrant.com/MetaTrader-4/Manual/ug_overview/ug_market_watch.aspx

http://www.scribd.com/doc/106387676/89/Market-spread-combination-order-entry

http://www.nseindia.com/products/content/equities/equities/risk_management.htm

www.nseindia.com/content/circulars/faop13774.pdf

Unit 11: Clearing and Settlement

Notes

CONTENTS

Objectives

Introduction

11.1 Clearing Entities in the F&O Segment

11.1.1 Clearing Members

11.1.2 Clearing Banks

11.2 Clearing Mechanism

11.3 Settlement Mechanism

11.3.1 Settlement of Futures Contracts

11.3.2 Settlement of Options Contracts

11.4 Summary

11.5 Keywords

11.6 Review Questions

11.7 Further Readings

Objectives

After studying this unit, you should be able to:

- Explain the entities in clearing and settlement activities in the F&O segment;
- Discuss the settlement mechanism in the F&O segment;
- Describe the settlement of futures and options contracts;
- Get an overview of special facility for settlement of institutional deals.

Introduction

In the previous unit, you have studied about the trader workstation and market watch window. We also discussed about the 'symbols' window, 'popup prices' window, ticks, trading in market watch and inquiry window, placing orders on the trading system. This unit will help you to understand entities in clearing and settlement activities in the F&O segment and settlement mechanism. We will also learn about the clearing mechanism essentially involves working out open positions and obligations of clearing members. The various sections and sub-section of this unit will also explain settlement of futures contracts and settlement of options contracts. Further, we will end up the unit with discussion on special facility for settlement of institutional deals. To make the learning easier, we will take the help of globally recognised best practices.

National Securities Clearing Corporation Limited (NSCCL) undertakes clearing and settlement of all trades executed on the futures and options (F&O) segment of the NSE. It also acts as legal counterparty to all trades on the F&O segment and guarantees their financial settlement. In order to encourage an institutional market where large volume trades come up for settlement in jumbo lots, two exclusive additional market segments, the institutional lot segment and trade-for-trade segment have been set up. NSE has an order driven system, which allows members to undertake jobbing in securities of their choice. Several members undertake jobbing on account

Notes

of the cease of entry and exit, and narrow margins which results in improved liquidity and reduced transaction costs.

11.1 Clearing Entities in the F&O Segment

A Clearing Member (CM) of NSCCL has the responsibility of clearing and settlement of all deals executed by Trading Members (TM) on NSE, who clear and settle such deals through entities. Clearing and settlement activities in the F&O segment are undertaken by NSCCL with the help of the following entities:

(a) Clearing Members

(b) Clearing Banks

Let us discuss them in detail.

11.1.1 Clearing Members

In the F&O segment, some members, called self clearing members, clear and settle their trades executed by them only either on their own account or on account of their clients. Some others called trading member-cum-clearing member, clear and settle their own trades as well as trades of other trading members (TMs). Besides, there is a special category of members, called professional clearing members (PCM) who clear and settle trades executed by TMs. The members clearing their own trades and trades of others, and the PCMs are required to bring in additional security deposits in respect of every TM whose trades they undertake to clear and settle. Primarily, the CM performs the following functions:

1. ***Clearing:*** Computing obligations of all his TM s i.e. determining positions to settle.
2. ***Settlement:*** Performing actual settlement. Only funds settlement is allowed at present in Index as well as Stock futures and options contracts.
3. ***Risk Management:*** Setting position limits based on upfront deposits margins for each TM and monitoring positions on a continuous basis.

Types of Clearing Members: The types of clearing members are:

- ***Trading Member Clearing Member (TM-CM):*** A Clearing Member who is also a TM. Such CMs may clear and settle their own proprietary trades, their clients trades as well as trades of other TM s.
- ***Professional Clearing Member (PCM):*** A CM who is not a TM. Typically banks or custodians could become a PCM and clear and settle for TM s.
- ***Self Clearing Member (SCM):*** A Clearing Member who is also a TM. Such CMs may clear and settle only their own proprietary trades and their clients trades but cannot clear and settle trades of other TM s.

11.1.2 Clearing Banks

Funds settlement takes place through clearing banks. For the purpose of settlement all clearing members are required to open a separate bank account with NSCCL designated clearing bank for F&O segment.

Did u know? NSCCL has empanelled 13 clearing banks namely Axis Bank Ltd., Bank of India, Canara Bank, Citibank N.A, HDFC Bank, Hongkong & Shanghai Banking Corporation

Notes

Ltd., ICICI Bank, IDBI Bank, IndusInd Bank, Kotak Mahindra Bank, Standard Chartered Bank, State Bank of India and Union Bank of India.

Every Clearing Member is required to maintain and operate clearing accounts with any of the empanelled clearing banks at the designated clearing bank branches. The clearing accounts are to be used exclusively for clearing & settlement operations.

Caselet

The Hyderabad Stock Exchange Limited

Rapid growth in industries in the erstwhile Hyderabad State saw efforts at starting the Stock Exchange. In November, 1941 some leading bankers and brokers formed the share and stock Brokers Association. In 1942, Mr. Gulab Mohammed, the Finance Minister formed a Committee for the purpose of constituting Rules and Regulations of the Stock Exchange. Sri Purushothamdas Thakurdas, President and Founder Member of the Hyderabad Stock Exchange performed the opening ceremony of the Exchange on 14.11.1943 under Hyderabad Companies Act; Mr. Kamal Yar Jung Bahadur was the first President of the Exchange. The HSE started functioning under Hyderabad Securities Contract Act of No. 21 of 1352 under H.E.H. Nizam's Government as a Company Limited by guarantee. It was the 6th Stock Exchange recognised under Securities Contract Act, after the Premier Stock Exchanges, Ahmedabad, Bombay, Calcutta, Madras and Bangalore stock Exchange. All deliveries were completed every Monday or the next working day.

The Securities Contracts (Regulation) Act, 1956 was enacted by the Parliament, passed into Law and the rules were also framed in 1957. The Act and the Rules were brought into force from 20th February 1957 by the Government of India. The HSE was first recognised by the Government of India on 29th September 1958 as Securities Regulation Act was made applicable to twin cities of Hyderabad and Secunderabad from that date. In view of substantial growth in trading activities, and for the yeoman services rendered by the Exchange, the Exchange was bestowed with permanent recognition with effect from 29th September 1983. The Exchange has a significant share in achievements of erstwhile State of Andhra Pradesh to its present state in the matter of Industrial development.

The Hyderabad Stock Exchange Ltd., established in 1943 as a Non-profit making organisation, catering to the needs of investing population started its operations in a small way in a rented building in Koti area. It had shifted into Aiyangar Plaza, Bank Street in 1987. In September 1989, the then Vice-President of India, Hon'ble Dr. Shankar Dayal Sharma had inaugurated the own building of the Stock exchange at Himayathnagar, Hyderabad. Later in order to bring all the trading members under one roof, the exchange acquired still a larger premises situated 6-3-654/A ; Somajiguda, Hyderabad - 82, with a six storied building and a constructed area of about 4,86,842 sft (including cellar of 70,857 sft). Considerably, there has been a tremendous perceptible growth which could be observed from the statistics.

The number of members of the Exchange was 55 in 1943, 117 in 1993 and increased to 300 with 869 listed companies having paid up capital of ₹ 19128.95 crores as on 31-03-2000. The business turnover has also substantially increased to ₹ 1236.51 crores in 1999-2000. The Exchange has got a very smooth settlement system.

Source: http://hseindia.org/abouthse.htm

Notes

Self Assessment

Fill in the blanks:

1. …… undertakes clearing and settlement of all trades executed on the futures and options (F&O) segment of the NSE.
2. In the F&O segment, some members, called …… clear and settle their trades executed by them only either on their own account or on account of their clients.
3. For the purpose of settlement all …… members are required to open a separate bank account with NSCCL designated clearing bank for F&O segment.

11.2 Clearing Mechanism

The clearing mechanism essentially involves working out open positions and obligations of clearing (self-clearing/trading-cum-clearing/professional clearing) members. This position is considered for exposure and daily margin purposes. The open positions of Clearing members (CMs) are arrived at by aggregating the open positions of all the trading members (TMs) and all custodial participants clearing through him, in contracts in which they have traded. A TM's open position is arrived at as the summation of his proprietary open position and clients' open positions, in the contracts in which he has traded. While entering orders on the trading system, TMs are required to identify the orders, whether proprietary (if they are their own trades) or client (if entered on behalf of clients) through 'Pro/Cli' indicator provided in the order entry screen. Proprietary positions are calculated on net basis (buy - sell) for each contract. Clients' positions are arrived at by summing together net (buy - sell) positions of each individual client.

Did u know? A TM's open position is the sum of proprietary open position, client open long position and client open short position.

Example: Given from Table 11.1 to Table 11.4. The proprietary open position on day 1 is simply = Buy - Sell = 200 - 400 = 200 short. The open position for client A = Buy (O) - Sell (C) = 400 – 200 = 200 long, i.e. he has a long position of 200 units. The open position for Client B = Sell (O) – Buy(C) = 600 – 200 = 400 short, i.e. he has a short position of 400 units. Now the total open position of the trading member Mr. X at end of day 1 is 200 (his proprietary open position on net basis) plus 600 (the Client open positions on gross basis), i.e. 800.

The proprietary open position at end of day 1 is 200 short. The end of day open position for proprietary trades undertaken on day 2 is 200 short. Hence the net open proprietary position at the end of day 2 is 400 short. Similarly, Client A's open position at the end of day 1 is 200 long. The end of day open position for trades done by Client A on day 2 is 200 long. Hence the net open position for Client A at the end of day 2 is 400 long. Client B's open position at the end of day 1 is 400 short. The end of day open position for trades done by Client B on day 2 is 200 short. Hence the net open position for Client B at the end of day 2 is 600 short. The net open position for the trading member at the end of day 2 is sum of the proprietary open position and client open positions. It works out to be 400 + 400 + 600, i.e. 1400.

The following table illustrates determination of open position of a CM, who clears for two TMs having two clients.

Notes

Table 11.1: Proprietary position of trading member Mr. X on Day 1

Trading member Mr. X trades in the futures and options segment for himself and two of his clients. The table shows his proprietary position.

Note: A buy position "200@1000" means 200 units bought at the rate of ₹ 100.

	Trading member Mr. X			
	Proprietary position	Buy	Sell	
		200 @ 1000	400 @100	

Table 11.2: Client position of trading member Mr. X on Day 1

Trading member Mr. X trades in the futures and options segment for himself and two of his clients. The table shows his client position.

	Trading member Mr. X					
		Buy Open	Sell Close	Sell Open	Buy Close	
	Client Position					
	Client A	400@1109	200@100			
	Client B			600@1100	400@1000	

Table 11.3: Proprietary Position of Trading Member Mr. X on Day 1

Assume that the position on Day 1 is carried forward to the next trading day and the following trades are also executed.

	Trading member Mr. X			
		Buy	Sell	
	Proprietary position	200 @ 1000	400 @100	

Table 11.4 Client Position of Trading Member Mr. X on Day 1

Trading member Mr. X trades in the futures and options segment for himself and two of his clients. The table shows his client position on Day 2.

	Trading member Mr. X					
		Buy Open	Sell Close	Sell Open	Buy Close	
	Client Position					
	Client A	400@1109	200@100			
	Client B			600@1100	400@1000	

Self Assessment

Choose the correct answer from the following options:

4. In futures trading, profits are received or losses are paid:
   - (a) In the delivery month
   - (b) On daily settlement
   - (c) On the day of expiry of the contract
   - (d) On a weekly settlement basis

Notes

5. Which of the following prices is used to compute MTM of a futures contract in case it is not traded on a given day?
   (a) Closing price of the underlying
   (b) Closing price of the futures contract
   (c) Theoretical price
   (d) MTM is not levied in such cases

11.3 Settlement Mechanism

All futures and options contracts are cash settled, i.e. through exchange of cash. The underlying for index futures/options of the Nifty index cannot be delivered. These contracts, therefore, have to be settled in cash.

Caution Futures and options on individual securities can be delivered as in the spot market.

However, it has been currently mandated that stock options and futures would also be cash settled. The settlement amount for a CM is netted across all their TMs/clients, with respect to their obligations on MTM, premium and exercise settlement.

Table 11.5: Determination of open Position of Clearing Member

TMs Clearing Through CM	Proprietary trades			Trades: Client 1			Trades: Client 2				
	Buy	Sell	Net	Buy	Sell	Net	Buy	Sell	Net	Long	Short
ABC	4000	2000	2000	3000	1000	2000	4000	2000	2000	6000	-
PQR	2000	3000	(1000)	2000	1000	1000	1000	2000	(1000)	1000	2000
Total	6000	5000	+2000	5000	2000	+3000	5000	4000	+2000	7000	2000
			-1000						-1000		

11.3.1 Settlement of Futures Contracts

Futures contracts have two types of settlements, the MTM settlement which happens on a continuous basis at the end of each day, and the final settlement which happens on the last trading day of the futures contract.

MTM Settlement: All futures contracts for each member are marked-to-market (MTM) to the daily settlement price of the relevant futures contract at the end of each day. The profits/losses are computed as the difference between:

1. The trade price and the day's settlement price for contracts executed during the day but not squared up.
2. The previous day's settlement price and the current day's settlement price for brought forward contracts.
3. The buy price and the sell price for contracts executed during the day and squared up.

Table 11.6 explains the MTM calculation for a member. The settlement price for the contract for today is assumed to be 105. The table gives the MTM charged on various positions.

Notes

Table 11.6: Composition of MTM at the End of the Day

The margin charged on the brought forward contract is the difference between the previous day's settlement price of ₹ 100 and today's settlement price of ₹ 105. Hence on account of the position brought forward, the MTM shows a profit of ₹ 500. For contracts executed during the day, the difference between the buy price and the sell price determines the MTM. In this example, 200 units are bought @ ₹ 100 and 100 units sold ® ₹ 102 during the day. Hence the MTM for the position closed during the day shows a profit of ₹ 200. Finally, the open position of contracts traded during the day, is margined at the day's settlement price and the profit of ₹ 500 credited to the MTM account. So the MTM account shows a profit of ₹ 1200.

Trade details	Quantity bought/sold	Settlement price	MTM
Brought forward from previous day	100@100	105	500
Traded during day			
Bought	200@100	102	200
Sold	100@102	105	500
Open position (not squared up)			
Total			**1200**

The CMs who have a loss are required to pay the mark-to-market (MTM) loss amount in cash which is in-turn passed on to the CMs who have made a MTM profit. This is known as daily mark-to-market settlement. CMs are responsible to collect and settle the daily MTM profits/ losses incurred by the TMs and their clients clearing and settling through them. Similarly, TMs are responsible to collect/pay losses/profits from/to their clients by the next day. The pay-in and pay-out of the mark-to-market settlement are affected on the day following the trade day.

Notes In case a futures contract is not traded on a day, or not traded during the last half hour, a 'theoretical settlement price' is computed as per the following formula:

$F = Se^{rT}$

Where:

F =Theoretical futures price

S = Value of the underlying index

r = Cost of financing (using continuously compounded interest rate) or rate of interest (MIBOR)

T = Time till expiration

e =2.71828

After completion of daily settlement computation, all the open positions are reset to the daily settlement price. Such positions become the open positions for the next day.

Task What is the outstanding position on which initial margin will be calculated if Mr. Madanlal buys 800 which @ 1060 and sells 400 units @1055.

Notes

Final Settlement for Futures: On the expiry day of the futures contracts, after the close of trading hours, NSCCL marks all positions of a CM to the final settlement price and the resulting profit/loss is settled in cash.

Caution Final settlement loss/profit amount is debited/credited to the relevant CM's clearing bank account on the day following expiry day of the contract.

Settlement Prices for Futures: Daily settlement price on a trading day is the closing price of the respective futures contracts on such day. The closing price for a futures contract is currently calculated as the last half an hour weighted average price of the contract in the F&O Segment of NSE. Final settlement price is the closing price of the relevant underlying index/security in the capital market segment of NSE, on the last trading day of the contract.

Did u know? The closing price of the underlying Index/security is currently its last half an hour weighted average value in the capital market segment of NSE.

11.3.2 Settlement of Options Contracts

Options contracts have three types of settlements, daily premium settlement, exercise settlement, interim exercise settlement in the case of option contracts on securities and final settlement.

Daily Premium Settlement: Buyer of an option is obligated to pay the premium towards the options purchased by him. Similarly, the seller of an option is entitled to receive the premium for the option sold by him. The premium payable amount and the premium receivable amount are netted to compute the net premium payable or receivable amount for each client for each option contract.

Exercise Settlement: Although most option buyers and sellers close out their options positions by an offsetting closing transaction, an understanding of exercise can help an option buyer determine whether exercise might be more advantageous than an offsetting sale of the option. There is always a possibility of the option seller being assigned an exercise. Once an exercise of an option has been assigned to an option seller, the option seller is bound to fulfil his obligation (meaning, pay the cash settlement amount in the case of a cash-settled option) even though he may not yet have been notified of the assignment.

Interim exercise settlement; Interim exercise settlement takes place only for option contracts on securities. An investor can exercise his in-the-money options at any time during trading hours, through his trading member. Interim exercise settlement is effected for such options at the close of the trading hours, on the day of exercise. Valid exercised option contracts are assigned to short positions in the option contract with the same series (i.e. having the same underlying, same expiry date and same strike price), on a random basis, at the client level.

Notes The CM who has exercised the option receives the exercise settlement value per unit of the option from the CM who has been assigned the option contract.

Final exercise settlement: Final exercise settlement is effected for all open long in-the-money strike price options existing at the close of trading hours, on the expiration day of an option contract. All such long positions are exercised and automatically assigned to short positions in option contracts with the same series, on a random basis. The investor, who has long in-the-

Notes

money options on the expiry date, will receive the exercise settlement value per unit of the option from the investor who has been assigned the option contract.

Exercise process: The period during which an option is exercisable depends on the style of the option. On NSE, index options are European style, i.e. options are only subject to automatic exercise on the expiration day, if they are in-the-money. As compared to this, options on securities are American style. In such cases, the exercise is automatic on the expiration day, and voluntary prior to the expiration day of the option contract, provided they are in-the-money. Automatic exercise means that all in-the-money options would be exercised by NSCCL on the expiration day of the contract. The buyer of such options need not give an exercise notice in such cases.

Did u know? Voluntary exercise means that the buyer of an in-the-money option can direct his TM/CM to give exercise instructions to NSCCL.

In order to ensure that an option is exercised on a particular day, the buyer must direct his TM to exercise before the cut-off time for accepting exercise instructions for that day. Usually, the exercise orders will be accepted by the system till the close of trading hours. Different TMs may have different cut-off times for accepting exercise instructions from customers, which may vary for different options. An option, which expires unexercised, becomes worthless. Some TMs may accept standing instructions to exercise, or have procedures for the exercise of every option, which is in-the-money at expiration.

Once an exercise instruction is given by a CM to NSCCL, it cannot ordinarily be revoked. Exercise notices given by a buyer at anytime on a day are processed by NSCCL after the close of trading hours on that day. All exercise notices received by NSCCL from the NEAT F&O system are processed to determine their validity. Some basic validation checks are carried out to check the open buy position of the exercising client/TM and if option contract is in-the-money.

Caution Once exercised contracts are found valid, they are assigned.

Assignment process: The exercise notices are assigned in standardised market lots to short positions in the option contract with the same series (i.e. same underlying, expiry date and strike price) at the client level. Assignment to the short positions is done on a random basis. NSCCL determines short positions, which are eligible to be assigned and then allocates the exercised positions to any one or more short positions. Assignments are made at the end of the trading day on which exercise instruction is received by NSCCL and notified to the members on the same day. It is possible that an option seller may not receive notification from its TM that an exercise has been assigned to him until the next day following the date of the assignment to the CM by NSCCL.

Exercise settlement computation: In case of index option contracts, all open long positions at in-the-money strike prices are automatically exercised on the expiration day and assigned to short positions in option contracts with the same series on a random basis. For options on securities, where exercise settlement may be interim or final, interim exercise for an open long in-the-money option position can be affected on any day till the expiry of the contract. Final exercise is automatically affected by NSCCL for all open long in-the-money positions in the expiring month option contract, on the expiry day of the option contract.

The exercise settlement price is the closing price of the underlying (index or security) on the exercise day (for interim exercise) or the expiry day of the relevant option contract (final exercise).

Notes

Did u know? The exercise settlement value is the difference between the strike price and the final settlement price of the relevant option contract.

For call options, the exercise settlement value receivable by a buyer is the difference between the final settlement price and the strike price for each unit of the underlying conveyed by the option contract, while for put options it is difference between the strike price and the final settlement price for each unit of the underlying conveyed by the option contract. Settlement of exercises of options on securities is currently by payment in cash and not by delivery of securities. It takes place for in-the-money option contracts.

The exercise settlement value for each unit of the exercised contract is computed as follows:

Call options = Closing price of the security on the day of exercise - Strike price

Put options = Strike price - Closing price of the security on the day of exercise

For final exercise the closing price of the underlying security is taken on the expiration day. The exercise settlement by NSCCL would ordinarily take place on 3rd day following the day of exercise. Members may ask for clients who have been assigned to pay the exercise settlement value earlier.

Special Facility for Settlement of Institutional Deals: NSCCL provides a special facility to Institutions/foreign Institutional Investors (FIIs)/Mutual Funds etc. to execute trades through any TM, which may be cleared and settled by their own CM. Such entities are called custodial participants (CPs). To avail of this facility, a CP is required to register with NSCCL through his CM. A unique CP code is allotted to the CP by NSCCL. All trades executed by a CP through any TM are required to have the CP code in the relevant field on the trading system at the time of order entry. Such trades executed on behalf of a CP are confirmed by their own CM (and not the CM of the TM through whom the order is entered), within the time specified by NSE on the trade day though the on-line confirmation facility.

Till such time the trade is confirmed by CM of concerned CP, the same is considered as a trade of the TM and the responsibility of settlement of such trade vests with CM of the TM. Once confirmed by CM of concerned CP, such CM is responsible for clearing and settlement of deals of such custodial clients. FIIs have been permitted to trade in all the exchange traded derivative contracts subject to compliance of the position limits prescribed for them and their sub-accounts, and compliance with the prescribed procedure for settlement and reporting. A Fl/a sub-account of the FII, as the case may be, intending to trade in the F&O segment of the exchange, is required to obtain a unique Custodial Participant (CP) code allotted from the NSCCL. FII/sub-accounts of FIIs which have been allotted a unique CP code by NSCCL are only permitted to trade on the F&O segment. The FII /sub-account of Fl ensures that all orders placed by them on the Exchange carry the relevant CP code allotted by NSCCL.

Self Assessment

Choose the correct answer from the following options:

6. Exercise settlement for option contracts takes place at:
   - (a) Settlement price of the futures contract
   - (b) Closing price of the underlying asset
   - (c) Closing price of the far month contract
   - (d) Closing price of the options contract

Notes

7. On the last day of trading, settlement for futures contracts takes place at:
   (a) Average of high and low for the underlying on that day
   (b) Closing price of the underlying
   (c) Closing price of the far month contract
   (d) Closing price of the options contract
8. In the case of options, final exercise settlement is:
   (a) Sequential
   (b) Random
   (c) Automatic
   (d) Voluntary
9. Which of the following option contracts are compulsorily settled on exercise date?
   (a) In the money options contracts
   (b) At the money options contracts
   (c) Out of the money options contracts
   (d) Deep out of the money options contracts
10. On expiry of a derivatives contract, the settlement price is the
   (a) Spot price of underlying asset
   (b) Futures close price
   (c) Sport price plus cost-of-carry
   (d) None of the above

Case Study

Anticipated Acquisition by Euronext NV of the London Stock Exchange Plc

Parties

Euronext N.V. (Euronext): Euronext N.V. (Euronext) is a pan-European exchange offering listing and trading services in Belgian, Dutch, French and Portuguese securities through the Brussels, Amsterdam, Lisbon and Paris bourse's respectively. Euronext is active in derivatives trading via Euronext.liffe, which comprises the London-based derivatives exchange, LIFFE, together with Euronext's Amsterdam, Brussels, Lisbon and Paris derivatives exchanges. Euronext also holds certain interests in entities providing post-trade services in the UK, discussed further below. The turnover of Euronext for the year ended 31 December 2003 was approximately €660 million.

London Stock Exchange Plc (LSE): London Stock Exchange Plc (LSE) is a Recognised Investment Exchange (RIE) under the Financial Services and Markets Act 2000 (FSMA). LSE demutualised in 2000, and became a listed UK plc in 2001. LSE's main business activities are: trading services in spot markets (which include listing and trading services); the generation and distribution of information products; and the development, implementation

Contd....

Notes

and operation of IT solutions for financial markets and market participants. Through a joint venture with Stockholmsboursen, the LSE also operates a small derivatives exchange, EDX London (EDX). The total turnover of the LSE in the financial year ending 31 March 2004 was approximately €250 million.

Transaction

On 20 December 2004 Euronext announced that it was considering making a cash offer to acquire the LSE, following a similar announcement by Deutsche Bourse AG (DBAG) on 13 December 2004. Euronext publicly reconfirmed its interest in a possible cash offer on 27 January 2005 and announced key elements of its potential proposal on 9 February 2005. (Elements of this proposal will be discussed at various points below.)

The proposed transaction was notified to the Official Fair Trade (OFT) on 28 January 2005. The OFT's administrative deadline for a decision is 29 March 2005.

Jurisdiction

As a result of this transaction Euronext and LSE will cease to be distinct. The UK turnover of LSE exceeds €70 million, so the turnover test in section 23(1) (b) of the Enterprise Act 2002 is satisfied. The OFT believes that it is or may be the case that arrangements are in progress or in contemplation which, if carried into effect, will result in the creation of a relevant merger situation.

Assessment

Euronext's proposed bid is one of two competing offers to acquire the LSE; the other is from DBAG. The OFT has considered each proposed offer on its merits. This has necessitated consideration of the prospects for competition in listing, equities trading (on-exchange trading services, clearing and settlement), derivatives trading and information services. In respect of listing, settlement, derivatives trading and information services, the OFT has identified no evidence that the merger would substantially lessen competition. The focus of this decision has therefore been on equities trading.

Competition to provide on-exchange trading services for equities in the UK (and indeed elsewhere) can be best be described as episodic. Episodes that appear to have prompted a competitive response from an incumbent exchange are characterised by a sufficiently credible threat (e.g., because of a better technology offering, lower prices or customer support) that liquidity might switch from one trading platform to another. Recent competition in the Netherlands among Euronext, the LSE and DBAG, and Euronext's contemplation of UK entry are consistent with this conclusion. It may be the case that the prospect of such competition in the UK acts as a stimulus to LSE at present, or has the potential to do so in the future. The current importance of Euronext in this regard is uncertain, and the potential threat from Euronext may not be unique. However, historic episodes of competition may not be a good guide to evolving competitive dynamics in this sector, so that the OFT considers that the evidence should be assessed with caution. While Euronext's arguments have merit, on balance and in light of all of the evidence, the OFT considers that the merger may eliminate important potential competition between the LSE and Euronext in respect of on-exchange trading of equities in the UK.

In respect of clearing, the OFT doubts there is a realistic prospect of a post-merger substantial lessening of competition. While the impact of Euronext's proposed corporate governance arrangements is difficult to predict, it remains the case that any financial benefit derived by Euronext from LCH's performance of the clearing function is small relative to LSE's trading revenues and the potential impact of higher clearing fees on levels of trading. Such dividend payments alone are therefore to be unlikely to be sufficient to incentives Euronext to end contestability of the clearing contract.

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Notes

On balance and on the basis of the evidence available to it, the OFT believes that there is a realistic prospect that the anticipated merger would substantially lessen competition in the supply of on-exchange trading services for equities in the UK.

Decision

Consequently, the OFT believes that it is or may be the case that the merger may be expected to result in a substantial lessening of competition within a market or markets in the United Kingdom. For the reasons given, the undertakings proposed cannot be accepted in lieu of reference. The merger is therefore referred to the Competition Commission under section 33(1) of the Act.

Questions:

1. Write down the case facts and analyse the situation.
2. What is the OFT's decision regarding transaction between Euronext and London Stock Exchange Plc (LSE).

Source: http://www.oft.gov.uk/OFTwork/mergers/decisions/2005/euronext#.UO0HU-SGw1s

11.4 Summary

- National Securities Clearing Corporation Limited (NSCCL) undertakes clearing and settlement of all trades executed on the futures and options (F&O) segment of the NSE.
- Clearing and settlement activities in the F&O segment are undertaken by NSCCL with the help of the Clearing Members and Clearing Banks.
- In the F&O segment, some members, called self clearing members, clear and settle their trades executed by them only either on their own account or on account of their clients. Funds settlement takes place through clearing banks.
- The clearing mechanism essentially involves working out open positions and obligations of clearing (self-clearing/trading-cum-clearing/professional clearing) members.
- All futures and options contracts are cash settled, i.e. through exchange of cash. The underlying for index futures/options of the Nifty index cannot be delivered.
- Options contracts have three types of settlements, daily premium settlement, exercise settlement, interim exercise settlement in the case of option contracts on securities and final settlement.
- In case of index option contracts, all open long positions at in-the-money strike prices are automatically exercised on the expiration day and assigned to short positions in option contracts with the same series on a random basis.
- All futures and options contracts are cash settled, i.e. through exchange of cash.
- The underlying for index futures/options of the Nifty index cannot be delivered. These contracts, therefore, have to be settled in cash.
- Futures and options on individual securities can be delivered as in the spot market. However, it has been currently mandated that stock options and futures would also be cash settled.
- The settlement amount for a CM is netted across all their TMs/clients, with respect to their obligations on MTM, premium and exercise settlement.

Notes

11.5 Keywords

Clearing Bank: A clearing bank is a banking institution that is a member of a national check clearing network that has the ability to approve or clear checks for payment, even if those checks are not written on accounts associated with that bank.

Clearing Corporation: Clearing Corporation for the purpose of these regulations means the Futures & Options Segment of the National Securities Clearing Corporation Limited or any other body which may be identified by the F&O Segment of the Exchange for the purpose of performing the clearing and settlement of Derivatives contracts.

Clearing Member: It implies a member of the clearing Corporation. It includes all categories of Clearing Members as may be admitted to the Futures & Options Segment of the Clearing Corporation.

Exercise: Exercise means the invocation of right, in accordance with and subject to Rules, Byelaws and Regulations of Exchange by the option holder.

Exercise process: The period during which an option is exercisable depends on the style of the option.

Interim exercise settlement: Interim exercise settlement takes place only for option contracts on securities.

Mark-to-market: Mark-to-market or fair value accounting refers to accounting for the "fair value" of an asset or liability based on the current market price, or for similar assets and liabilities, or based on another objectively assessed "fair" value.

Professional Clearing Members: They clear and settle trades executed by TMs.

Self clearing members: In the F&O segment, some members, called self clearing members, clear and settle their trades executed by them only either on their own account or on account of their clients.

Trading Members: It refers to a member of the BSE/NSE who is authorised to place orders in the Capital Market System.

11.6 Review Questions

1. Write about clearing members.
2. Write down the functions of clearing members.
3. What are the types of clearing members?
4. Write about clearing banks.
5. Briefly explain about the clearing mechanism.
6. Discuss the settlement of futures & options contracts.
7. What is marked-to-market settlement?
8. Describe the special facility for settlement of institutional deals.
9. Explain the need and operation of margins in relation to the futures contracts, explaining the concept of marking to market in this context.
10. Explain the different types of orders which may be placed in buying a derivative contract?

Notes

Answers: Self Assessment

1. National Securities Clearing Corporation Limited (NSCCL)
2. Self clearing members
3. Clearing
4. b. On daily settlement
5. c. Theoretical price
6. b. Closing price of the underlying asset
7. b. Closing price of the underlying
8. c. Automatic
9. a. In the money options contracts
10. a. Spot price of underlying asset

11.7 Further Readings

Books

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Gupta S.L (2007). *Financial Derivatives* Prentice Hall. New Delhi.

Indian Stock Market Review. National Stock Exchange Publications.

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Online links

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http://www.sebi.gov.in

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Notes

Unit 12: Risk Management of Financial Derivatives

CONTENTS

Objectives

Introduction

12.1 Risks Associated with Derivative Activities

12.2 Risk Management Systems (Volatility, Types of Margins & SPAN)

12.2.1 NSCCL—SPAN

12.2.2 Types of Margins

12.3 Margining System

12.3.1 SPAN Approach of Computing Initial Margins

12.3.2 Mechanics of SPAN

12.3.3 Overall Portfolio Margin Requirement

12.3.4 Cross Margining

12.4 Adjustments for Corporate Actions

12.5 Summary

12.6 Keywords

12.7 Review Questions

12.8 Further Readings

Objectives

After studying this unit, you should be able to:

- Discuss the risks associated with derivative activities;
- Explain the risk management systems (volatility, types of margins & span);
- Identify the features of risk containment mechanism on the F&O segment;
- Describe the margining system.

Introduction

In the previous unit, you have studied about the entities in clearing and settlement activities in the F&O segment and settlement mechanism, clearing mechanism essentially involves working out open positions and obligations of clearing members. We also discussed about the settlement of futures contracts & options contracts and special facility for settlement of institutional deals. This unit will help you to understand the risks associated with derivative activities. We will also learn about the risk management systems and features of risk containment mechanism on the F&O segment. The various sections and sub section of this unit will also explain objective of NSCCL-SPAN, types of margins, SPAN approach of computing initial margins, mechanics of SPAN and adjustments for corporate actions. Further, we will end up the unit with discussion with margining system. To make the learning easier, we will take the help of globally recognised best practices.

Notes

Market deregulation, growth in global trade, and continuing technological developments have revolutionised the financial marketplace during the past two decades. A by-product of this revolution is increased market volatility, which has led to a corresponding increase in demand for risk management products. This demand is reflected in the growth of financial derivatives from the standardised futures and options products of the 1970s to the wide spectrum of over-the-counter (OTC) products offered and sold in the 1990s.

12.1 Risks Associated with Derivative Activities

Risk is the potential that events, expected or unanticipated, may have an adverse impact on the bank's capital and earnings. There are nine categories of risk for bank supervision purposes. These risks are: strategic, reputation, price, foreign exchange, liquidity, interest rate, credit, transaction, and compliance. These categories are not mutually exclusive. Any product or service may expose the bank to multiple risks.

Caution Derivative activities must be managed with consideration of all of these risks.

Many products and instruments are often described as derivatives by the financial press and market participants. Financial derivatives are broadly defined as instruments that primarily derive their value from the performance of underlying interest or foreign exchange rates, equity, or commodity prices.

Financial derivatives come in many shapes and forms, including futures, forwards, swaps, options, structured debt obligations and deposits, and various combinations thereof. Some are traded on organised exchanges, whereas others are privately negotiated transactions. Derivatives have become an integral part of the financial markets because they can serve several economic functions. Derivatives can be used to reduce business risks, expand product offerings to customers, trade for profit, manage capital and funding costs, and alter the risk-reward profile of a particular item or an entire balance sheet.

Although derivatives are legitimate and valuable tools for banks, like all financial instruments they contain risks that must be managed. Managing these risks should not be considered unique or singular. Rather, doing so should be integrated into the bank's overall risk management structure. Risks associated with derivatives are not new or exotic. They are basically the same as those faced in traditional activities (e.g., price, interest rate, liquidity, credit risk).

Notes Fundamentally, the risk of derivatives (as of all financial instruments) is a function of the timing and variability of cash flows.

Derivatives are high-risk instruments and hence the exchanges have put up a lot of measures to control this risk. The most critical aspect of risk management is the daily monitoring of price and position and the margining of those positions. The exposure from an adverse change in foreign exchange rates is a function of spot foreign exchange rates and domestic and foreign interest rates. Any forward premium or discount in the value of a foreign currency relative to the domestic currency is determined largely by relative interest rates. Foreign exchange rates can be and have been very volatile (e.g., EMS crisis of 1992). Accurate measurement of derivative-related risks is necessary for proper monitoring and control. All significant risks should be measured and integrated into a bank-wide or corporate-wide risk management system.

Notes

Example: Price risk measurement should incorporate exposure from derivatives, as well as cash products.

Measurement of some types of risk is an approximation. Certain risks, such as liquidity risk, can be very difficult to quantify precisely and can vary with economic and market conditions. At a minimum, management should regularly assess vulnerabilities to these risks in response to changing circumstances. The sophistication and precision of risk measurement methods will vary by the types, volumes, and riskiness of the activities. Various types of risk measurement methods are discussed later in this guidance within each risk section (e.g., sections on price, credit, and liquidity risk).

Task Find out the various types of foreign exchange risks.

Self Assessment

Fill in the blanks:

1. …… are broadly defined as instruments that primarily derive their value from the performance of underlying interest or foreign exchange rates, equity, or commodity prices.
2. Derivatives are …… instruments and hence the exchanges have put up a lot of measures to control this risk.

12.2 Risk Management Systems (Volatility, Types of Margins & SPAN)

NSCCL has developed a comprehensive risk containment mechanism for the F&O segment. Risk containment measures include capital adequacy requirements of members, monitoring of member performance and track record, stringent margin requirements, position limits based on capital, online monitoring of member positions and automatic disablement from trading when limits are breached. The salient features of risk containment mechanism on the F&O segment are:

1. The financial soundness of the members is the key to risk management. Therefore, the requirements for membership in terms of capital adequacy (net worth, security deposits) are quite stringent.
2. NSCCL charges an upfront initial margin for all the open positions of a CM. It specifies the initial margin requirements for each futures/options contract on a daily basis. It also follows value-at risk (VaR) based margining through SPAN. The CM in turn collects the initial margin from the TMs and their respective clients.
3. The open positions of the members are marked to market based on contract settlement price for each contract. The difference is settled in cash on a T +1 basis.
4. NSCCL's on-line position monitoring system monitors a CM's open positions on a real-time basis. Limits are set for each CM based on his capital deposits. The on-line position monitoring system generates alerts whenever a CM reaches a position limit set up by NSCCL.

Did u know? NSCCL monitors the CMs for MTM value violation, while TMs are monitored for contract-wise position limit violation.

Notes

5. CMs are provided a trading terminal for the purpose of monitoring the open positions of all the TMs clearing and settling through him. A CM may set exposure limits for a TM clearing and settling through him. NSCCL assists the CM to monitor the intra-day exposure limits set up by a CM and whenever a TM exceeds the limits, it stops that particular TM from further trading.
6. A member is alerted of his position to enable him to adjust his exposure or bring in additional capital. Position violations result in withdrawal of trading facility for all TMs of a CM in case of a violation by the CM.
7. A separate settlement guarantee fund for this segment has been created out of the capital of members.

The most critical component of risk containment mechanism for F & O segment is the margining system and on-line position monitoring. The actual position monitoring and margining is carried out on-line through Parallel Risk Management System (PRISM).

Notes PRISM uses SPAN(r) (Standard Portfolio Analysis of Risk) system for the purpose of computation of on-line margins, based on the parameters defined by SEBI.

12.2.1 NSCCL-SPAN

The objective of NSCCL-SPAN is to identify overall risk in a portfolio of all futures and options contracts for each member. The system treats futures and options contracts uniformly, while at the same time recognising the unique exposures associated with options portfolios, like extremely deep out-of-the-money short positions and inter-month risk. Its over-riding objective is to determine the largest loss that a portfolio might reasonably be expected to suffer from one day to the next day based on 99% VaR methodology. SPAN considers uniqueness of option portfolios. The following factors affect the value of an option:

1. Underlying market price
2. Strike price
3. Volatility (variability) of underlying instrument
4. Time to expiration
5. Interest rate

As these factors change, the value of options maintained within a portfolio also changes. Thus, SPAN constructs scenarios of probable changes in underlying prices and volatilities in order to identify the largest loss a portfolio might suffer from one day to the next. It then sets the margin requirement to cover this one-day loss.

12.2.2 Types of Margins

The margining system for F&O segment is explained below:

- ***Initial margin:*** Margin in the F&O segment is computed by NSCCL up to client level for open positions of CMs/TMs. These are required to be paid up-front on gross basis at individual client level for client positions and on net basis for proprietary positions. NSCCL collects initial margin for all the open positions of a CM based on the margins computed by NSE-SPAN. A CM is required to ensure collection of adequate initial margin from his TMs up-front. The TM is required to collect adequate initial margins up-front from his clients.

Notes

- ***Premium margin:*** In addition to initial margin, premium margin is charged at client level. This margin is required to be paid by a buyer of an option till the premium settlement is complete.
- ***Assignment margin:*** Assignment margin is levied in addition to initial margin and premium margin. It is required to be paid on assigned positions of CMs towards exercise settlement obligations for option contracts, till such obligations are fulfilled. The margin is charged on the net exercise settlement value payable by a CM.

Caselet

"Don't Bet the Ranch!"

In April 1995, the Federal Reserve Bank of Boston hosted an educational forum for users of derivatives, What Should You Be Asking About Derivatives? E. Gerald Corrigan, former president of the Federal Reserve Bank of New York, offered some valuable, plain English words of advice to those in attendance.

When it comes to derivatives, they are words to live by:

- Don't be shy about asking questions. That may seem very simple, but the fact of the matter is that derivatives intimidate people.
- Don't give a second thought to whether a question may or may not be stupid. It doesn't matter. Press. your own people. Press your dealer. If you can't find the answer to your question there, then talk to a regulator or lawyer. But ask questions and ask questions aggressively.
- If you don't understand how a particular transaction is valued, and if you cannot satisfy yourself as to how to determine that value, just don't do the transaction. Those extra 2 basis points won't make or break your life.
- If someone calls you on the phone and is trying to sell you a 10 percent piece of paper in a 7 percent market, tell them they have the wrong number.
- Don't bet the ranch on anything. None of us is smart enough to do that.

Source: www.bos.frb.org/education/pubs/toolsoft.pdf - United States

Self Assessment

State whether the following statements are true or false:

3. NSCCL charges an upfront initial margin for all the open positions of a CM.
4. The most critical component of risk containment mechanism for F & O segment is the margining system and on-line position monitoring.
5. SPAN has the ability to estimate risk for combined futures and options portfolios, and also re-value the same under various scenarios of changing market conditions.
6. NSCCL collects initial margin for all the open positions of a CM based on the margins computed by NSE-SPAN.
7. Premium margin is levied in addition to initial margin and premium margin.

12.3 Margining System

NSCCL has developed a comprehensive risk containment mechanism for the Futures & Options segment. The most critical component of a risk containment mechanism is the online position

Notes

monitoring and margining system. The actual margining and position monitoring is done online, on an intra-day basis using PRISM (Parallel Risk Management System) which is the real time position monitoring and risk management system.

Notes The risk of each trading and clearing member is monitored on a real-time basis and alerts/disablement messages are generated if the member crosses the set limits.

12.3.1 SPAN Approach of Computing Initial Margins

The objective of SPAN is to identify overall risk in a portfolio of futures and options contracts for each member. The system treats futures and options contracts uniformly, while at the same time recognising the unique exposures associated with options portfolios like extremely deep out-of-the-money short positions, inter-month risk and inter-commodity risk. Because SPAN is used to determine performance bond requirements (margin requirements), its overriding objective is to determine the largest loss that a portfolio might reasonably be expected to suffer from one day to the next day. In standard pricing models, three factors most directly affect the value of an option at a given point in time:

1. Underlying market price
2. Volatility (variability) of underlying instrument
3. Time to expiration

As these factors change, so the value of futures and options maintained within a portfolio. SPAN constructs sixteen scenarios of probable changes in underlying prices and volatilities in order to identify the largest loss a portfolio might suffer from one day to the next. It then sets the margin requirement at a level sufficient to cover this one-day loss. The computation of worst scenario loss has two components. The first is the valuation of each contract under sixteen scenarios. The second is the application of these scenario contract values to the actual positions in a portfolio to compute the portfolio values and the worst scenario loss.

Did u know? The scenario contract values are updated at least 5 times in the day, which may be carried out by taking prices at the start of trading, at 11:00 a.m., at 12:30 p.m., at 2:00 p.m., and at the end of the trading session.

12.3.2 Mechanics of SPAN

The results of complex calculations (e.g. the pricing of options) in SPAN are called risk arrays. Risk arrays, and other necessary data inputs for margin calculation are then provided to members on a daily basis in a file called the SPAN Risk Parameter file.

Members can apply the data contained in the risk parameter files, to their specific portfolios of futures and options contracts, to determine their SPAN margin requirements. SPAN has the ability to estimate risk for combined futures and options portfolios, and re-value the same under various scenarios of changing market conditions.

Risk Arrays: The SPAN risk array represents how a specific derivative instrument (for example, an option on NIFTY index at a specific strike price) will gain or lose value, from the current point in time to a specific point in time in the near future, for a specific set of market conditions which may occur over this time duration. The results of the calculation for each risk scenario i.e. the amount by which the futures and options contracts will gain or lose value over the look-ahead time under that risk scenario is called the risk array value for that scenario. The set of risk array

Notes

values for each futures and options contract under the full set of risk scenarios constitutes the risk array for that contract. In the risk array, losses are represented as positive values, and gains as negative values.

Caution Risk array values are represented in Indian Rupees, the currency in which the futures or options contract is denominated.

Risk Scenarios: The specific set of market conditions evaluated by SPAN, are called the risk scenarios, and these are defined in terms of:

1. How much the price of the underlying instrument is expected to change over one trading day, and
2. How much the volatility of that underlying price is expected to change over one trading day.

SPAN further uses a standardised definition of the risk scenarios, defined in terms of:

1. The underlying price scan range or probable price change over a one day period, and
2. The underlying price volatility scan range or probable volatility change of the underlying over a one day period.

Table 12.1 gives the sixteen risk scenarios. +1 refers to increase in volatility and -1 refers to decrease in volatility.

Table 12.1: Worst Scenario Loss

Risk scenario number	Price move in multiples of price scan rang	Volatility move multiples of volatility range	Fraction of loss considered (%)
1	0	+ 1	100
2	0	– 1	100
3	+ 1/3	+ 1	100
4	+ 1/3	– 1	100
5	– 1/3	+ 1	100
6	– 1/3	– 1	100
7	+ 2/3	+ 1	100
8	+ 2/3	– 1	100
9	– 2/3	+ 1	100
10	– 2/3	– 1	100
11	+ 1	+ 1	100
12	+ 1	– 1	100
13	– 1	+ 1	100
14	– 1	– 1	100
15	+ 2	0	35
16	– 2	0	35

Notes

Scanning Risk Charge: As shown in the table giving the sixteen standard risk scenarios, SPAN starts at the last underlying market settlement price and scans up and down three even intervals of price changes (price scan range). At each price scan point, the program also scans up and down a range of probable volatility from the underlying market's current volatility (volatility scan range). SPAN calculates the probable premium value at each price scan point for volatility up and volatility down scenario. It then compares this probable premium value to the theoretical premium value (based on last closing value of the underlying) to determine profit or loss.

Deep-out-of-the-money short options positions pose a special risk identification problem. As they move towards expiration, they may not be significantly exposed to "normal" price moves in the underlying. However, unusually large underlying price changes may cause these options to move into-the-money, thus creating large losses to the holders of short option positions. In order to account for this possibility, two of the standard risk scenarios in the risk array, Number 15 and 16, reflect an "extreme" underlying price movement, currently defined as double the maximum price scan range for a given underlying. However, because price changes of these magnitudes are rare, the system only covers 35% of the resulting losses.

After SPAN has scanned the 16 different scenarios of underlying market price and volatility changes, it selects the largest loss from among these 16 observations.

Notes This "largest reasonable loss" is the scanning risk charge for the portfolio.

Calendar Spread Margin: A calendar spread is a position in an underlying with one maturity which is hedged by an offsetting position in the same underlying with a different maturity.

Example: A short position in a July futures contract on Reliance and a long position in the August futures contract on Reliance is a calendar spread. Calendar spreads attract lower margins because they are not exposed to market risk of the underlying. If the underlying rises, the July contract would make a loss while the August contract would make a profit.

As SPAN scans futures prices within a single underlying instrument, it assumes that price moves correlate perfectly across contract months. Since price moves across contract months do not generally exhibit perfect correlation, SPAN adds a calendar spread charge (also called the inter-month spread charge) to the scanning risk charge associated with each futures and options contract. To put it in a different way, the calendar spread charge covers the calendar basis risk that may exist for portfolios containing futures and options with different expirations. For each futures and options contract, SPAN identifies the delta associated each futures and option position, for a contract month. It then forms spreads using these deltas across contract months.

Notes For each spread formed, SPAN assesses a specific charge per spread which constitutes the calendar spread charge.

The margin for calendar spread is calculated on the basis of delta of the portfolio in each month. Thus a portfolio consisting of a near month option with a delta of 100 and a far month option with a delta of 100 would bear a spread charge equivalent to the calendar spread charge for a portfolio which is long 100 near month futures contract and short 100 far month futures contract. A calendar spread position on Exchange traded equity derivatives may be granted calendar spread treatment till the expiry of the near month contract. Margin on calendar spreads is levied at 0.5% per month of spread on the far month contract of the spread subject to a minimum margin of 1% and a maximum margin of 3% on the far month contract of the spread.

Notes

Short Option Minimum Margin: Short options positions in extremely deep-out-of-the-money strikes may appear to have little or no risk across the entire scanning range. However, in the event that underlying market conditions change sufficiently, these options may move into-the-money, thereby generating large losses for the short positions in these options. To cover the risks associated with deep out-of-the-money short options positions, SPAN assesses a minimum margin for each short option position in the portfolio called the short option minimum charge, which is set by the NSCCL. The short option minimum charge serves as a minimum charge towards margin requirements for each short position in an option contract.

Example: Suppose that the short option minimum charge is ₹ 50 per short position. A portfolio containing 20 short options will have a margin requirement of at least ₹ 1,000; even if the scanning risk charge plus the calendar spread charge on the position is only ₹ 500.

The short option minimum margin equal to 3% of the notional value of all short index options is charged if sum of the worst scenario loss and the calendar spread margin is lower than the short option minimum margin. For stock options it is equal to 7.5% of the notional value based on the previous day's closing value of the underlying stock. Notional value of option positions is calculated on the short option positions by applying the last closing price of the relevant underlying.

Net Option Value: The net option value is calculated as the current market value of the option times the number of option units (positive for long options and negative for short options) in the portfolio. Net option value is added to the liquid net worth of the clearing member. This means that the current market value of short options is deducted from the liquid net worth and the market value of long options is added thereto. Thus mark to market gains and losses on option positions get adjusted against the available liquid net worth.

Net Buy Premium: To cover the one day risk on long option positions (for which premium shall be payable on T+1 day), net buy premium to the extent of the net long options position value is deducted from the Liquid Net worth of the member on a real time basis. This would be applicable only for trades done on a given day. The net buy premium margin shall be released towards the Liquid Net worth of the member on T+1 day after the completion of pay-in towards premium settlement.

Task Evaluate the Bank's participation in derivatives markets in India.

12.3.3 Overall Portfolio Margin Requirement

The total margin requirements for a member for a portfolio of futures and options contract would be computed by SPAN as follows:

1. Adds up the scanning risk charges and the calendar spread charges.
2. Compares this figure to the short option minimum charge and selects the larger of the two. This is the SPAN risk requirement.
3. Total SPAN margin requirement is equal to SPAN risk requirement less the net option value, which is mark to market value of difference in long option positions and short option positions.
4. Initial margin requirement = Total SPAN margin requirement + Net Buy Premium.

Notes

12.3.4 Cross Margining

Cross margining benefit is provided for off-setting positions at an individual client level in equity and equity derivatives segment. The cross margin benefit is provided on following offsetting positions:

(a) Index Futures and constituent Stock Futures positions in F&O segment

(b) Index futures position in F&O segment and constituent stock positions in CM segment

(c) Stock futures position in F&O segment and stock positions in CM segment

1. In order to extend the cross margining benefit as per (a) and (b) above, the basket of constituent stock futures/stock positions needs to be a complete replica of the index futures.
2. The positions in F&O segment for stock futures and index futures of the same expiry month are eligible for cross margining benefit.
3. The position in a security is considered only once for providing cross margining benefit. E.g. Positions in Stock Futures of security A used to set-off against index futures positions is not considered again if there is an off-setting position in the security A in Cash segment.
4. Positions in option contracts are not considered for cross margining benefit. The positions which are eligible for offset are subjected to spread margins. The spread margins shall be 25% of the applicable upfront margins on the offsetting positions.

Prior to the implementation of a cross margining mechanism positions in the equity and equity derivatives segment were been treated separately, despite being traded on the common underlying securities in both the segments.

Example: Mr. X bought 100 shares of a security A in the capital market segment and sold 100 shares of the same security in single stock futures of the F&O segment. Margins were payable in the capital market and F&O segments separately. If the margins payable in the capital market segment is ₹ 100 and in the F&O segment is ₹ 140, the total margin payable by MR. X is ₹ 240. The risk arising out of the open position of Mr. X in the capital market segment is significantly mitigated by the corresponding off-setting position in the F&O segment. Cross margining mechanism reduces the margin for Mr. X from ₹ 240 to only ₹ 60.

Self Assessment

Fill in the blanks:

8. The objective of SPAN is to identify …… in a portfolio of futures and options contracts for each member.
9. The scenario contract values are updated at least …… times in the day.
10. The SPAN …… represents how a specific derivative instrument will gain or lose value, from the current point in time to a specific point in time in the near future.
11. The specific set of market conditions evaluated by SPAN are called the ……
12. A …… is a position in an underlying with one maturity which is hedged by an offsetting position in the same underlying with a different maturity.

Notes

12.4 Adjustments for Corporate Actions

Adjustments for corporate actions for stock options would be as follows:

- The basis for any adjustment for corporate action shall be such that the value of the position of the market participants on cum and ex-date for corporate action shall continue to remain the same as far as possible. This will facilitate in retaining the relative status of positions namely in-the-money, at-the-money and out-of-money. This will also address issues related to exercise and assignments.
- Adjustment for corporate actions shall be carried out on the last day on which a security is traded on a cum-basis in the underlying cash market.
- Adjustments shall mean modifications to positions and/or contract specifications namely strike price, position, market lot, and multiplier. These adjustments shall be carried out on all open, exercised as well as assigned positions.
- The corporate actions may be broadly classified under stock benefits and cash benefits.
- The various stock benefits declared by the issuer of capital are bonus, rights, merger/de–merger, amalgamation, splits, consolidations, hive-off, warrants and secured premium notes and dividends.
- The methodology for adjustment of corporate actions such as bonus, stock splits and consolidations is as follows:
    - *Strike price:* The new strike price shall be arrived at by dividing the old strike price by the adjustment factor as under.
    - *Market lot/multiplier:* The new market lot/multiplier shall be arrived at by multiplying the old market lot by the adjustment factor as under.
    - *Position:* The new position shall be arrived at by multiplying the old position by the adjustment factor, which will be computed using the pre-specified methodology.

The adjustment factor for bonus, stock splits and consolidations is arrived at as follows:

- Bonus: Ratio - A:B; Adjustment factor: (A+B)/B
- Stock splits and consolidations: Ratio - A:B ; Adjustment factor: B/A
- Right: Ratio - A:B
- Premium: C
- Face value: D
- Existing strike price: X
- New strike price: ((B * X) + A * (C + D))/(A+B)
- Existing market lot/multiplier/position: Y ; New issue size : Y * (A+B)/B

The above methodology may result in fractions due to the corporate action e.g. a bonus ratio of 3:7. With a view to minimising fraction settlements, the following methodology is proposed to be adopted:

1. Compute value of the position before adjustment.
2. Compute value of the position taking into account the exact adjustment factor.
3. Carry out rounding off for the Strike Price and Market Lot.
4. Compute value of the position based on the revised strike price and market lot.

Notes

The difference between 1 and 4 above, if any, shall be decided in the manner laid down by the group by adjusting strike price or market lot, so that no forced closure of open position is mandated.

- Dividends which are below 10% of the market value of the underlying stock would be deemed to be ordinary dividends and no adjustment in the strike price would be made for ordinary dividends. For extraordinary dividends, above 10% of the market value of the underlying stock, the strike price would be adjusted.
- The exchange will on a case to case basis carry out adjustments for other corporate actions as decided by the group in conformity with the above guidelines.

Self Assessment

Fill in the blanks:

13. Adjustment for corporate actions shall be carried out on the ……. on which a security is traded on cum-basis.
14. Dividends which are below …….. of the market value of the underlying stock would be deemed to be ordinary dividends and no adjustment in the strike price would be made for ordinary dividends.
15. The exchange will on a …….. basis carry out adjustments for other corporate actions.

Case Study

Vanilla and Other Flavours

Basic derivative instruments such as futures and options are often referred to as "plain vanilla," although this term is most often applied to an instrument called a swap. More exotic "flavours" include instruments such as "repos" and some that have more bizarre names like "frogs" or "swaptions." While more complex, these instruments are similar to other derivatives in that they are a contract based on another asset. Let's examine a swap. As the name implies, this instrument swaps one thing for another. Usually, it's an interest rate swap. For example, an organisation with debt, payable at a fixed rate of interest, will swap its interest payments for a floating rate payment. Here's an example of how the system works.

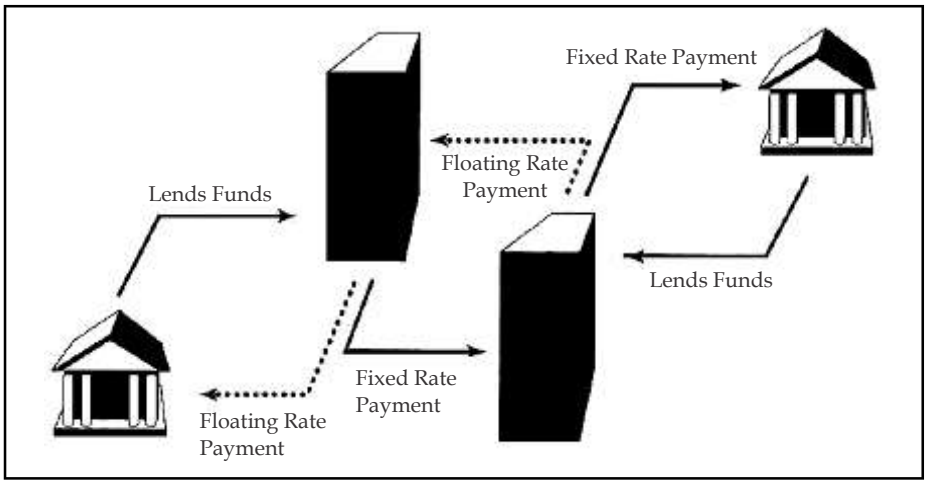
CDB Corporation has borrowed $1 million at a floating rate, currently 7 percent. CDB is concerned that rates will rise. CDB would like to make fixed interest payments of 8 percent. NQ, Inc. has borrowed $1 million at a fixed rate of 8 percent and has invested the funds at a variable rate. It is concerned that, if rates fall, the investment might not be profitable. It is willing to make CDB's interest payments at a floating rate over five years, if CDB will pay the 8 percent fixed rate on NQ's loan for the same period of time. The two parties agree to swap interest rates. CDB will still make floating-rate interest payments to its bank, but will receive from NQ floating-rate interest payments exactly the same as what it is paying. Similarly, NQ will still make the 8 percent fixed-rate interest payments to its bank, but will receive from CDB interest payments precisely equivalent to the payments it is making. The net effect of this interest rate exchange is that CDB ends up making fixed-rate interest payments, in accordance with its wishes, and NQ ends up making floating-rate interest payments, in accordance with its preferences. Both companies will continue to make the appropriate principal repayments to their respective banks in accordance with their loan agreements.

Contd....

Notes

Why did CDB and NQ use swaps? One answer is the expectations of the two companies, each trying to avoid .a certain risk. The companies have different opinions of which way interest rates are headed and different needs. Based on those opinions and needs, the companies are trying to manage their risk.

Interest rate swaps provide users with a way of hedging the effects of changing interest rates. CDB is reducing the risk of borrowing funds at a floating rate at a time when it expects rates will rise. NQ is gaining protection against falling interest rates. The lender of funds for each company is not affected because it receives the correct principal and interest payments. Such transactions, multiplied many times over, help foster a more liquid and competitive marketplace.



Questions:

1. Write down the case facts.
2. What is plain vanilla strategy?
3. Explain the process of swap applied by the CDB and NQ.
4. Give reason (any other as give in case) why did CDB and NQ use swaps?

Source: Adapted from Federal Reserve Bank of Chicago, On Reserve, September 1995.

12.5 Summary

- There are nine categories of risk for bank supervision purposes. These risks are: strategic, reputation, price, foreign exchange, liquidity, interest rate, credit, transaction, and compliance.
- Financial derivatives come in many shapes and forms, including futures, forwards, swaps, options, structured debt obligations and deposits, and various combinations thereof.
- Risk containment measures include capital adequacy requirements of members, monitoring of member performance and track record, stringent margin requirements, position limits based on capital, online monitoring of member positions and automatic disablement from trading when limits are breached.
- The objective of NSCCL—SPAN is to identify overall risk in a portfolio of all futures and options contracts for each member.

Notes

- NSCCL has developed a comprehensive risk containment mechanism for the Futures & Options segment. The most critical component of a risk containment mechanism is the online position monitoring and margining system.
- The basis for any adjustment for corporate action shall be such that the value of the position of the market participants on cum and ex-date for corporate action shall continue to remain the same as far as possible.
- Deep-out-of-the-money short options positions pose a special risk identification problem. As they move towards expiration, they may not be significantly exposed to "normal" price moves in the underlying.
- A calendar spread is a position in an underlying with one maturity which is hedged by an offsetting position in the same underlying with a different maturity.
- Cross margining benefit is provided for offsetting positions at an individual client level in equity and equity derivatives segment.
- Prior to the implementation of a cross margining mechanism positions in the equity and equity derivatives segment were been treated separately, despite being traded on the common underlying securities in both the segments.

12.6 Keywords

- ***Assignment margin:*** Assignment margin is levied in addition to initial margin and premium margin.
- ***Derivative:*** A security, like an Option or Future, whose value is derived from another underlying security. Futures contracts, forward contracts, and options are among the most common types of derivatives.
- ***Financial derivatives:*** Financial derivatives are broadly defined as instruments that primarily derive their value from the performance of underlying interest or foreign exchange rates, equity, or commodity prices.
- ***Premium margin:*** Premium margin is charged at client level.
- ***Risk:*** The chance of financial loss, or more formally, the variability of returns associated with a given asset. The chance that actual outcomes may differ from those expected.
- ***Risk Array:*** The amount by which the futures and options contracts will gain or lose value over the look-ahead time under that risk scenario
- ***Risk scenarios:*** The specific set of market conditions evaluated by SPAN, are called the risk scenarios.
- ***SPAN risk parameter file:*** Risk arrays and other necessary data inputs for margin calculation are provided to members daily in a file called the SPAN risk parameter file.

12.7 Review Questions

1. What is risk?
2. Write down the nine categories of risk for bank supervision purposes.
3. "Risks associated with derivatives are not new or exotic." Discuss.
4. "NSCCL has developed a comprehensive risk containment mechanism for the F&O segment." Explain the statements with appropriate example.

Notes

5. Write down the features of risk containment mechanism on the F&O segment.
6. What are the objective of NSCCL-SPAN?
7. Explain the various types of margins.
8. What is margining system?
9. Explain the mechanics of SPAN.
10. Write short note in:
    (a) Calendar Spread Margin
    (b) Scanning Risk Charge
    (c) Short Option Minimum Margin
    (d) Net Buy Premium

Answers: Self Assessment

1.	Financial derivatives	2.	High-risk
3.	True	4.	True
5.	True	6.	True
7.	False	8.	Overall risk
9.	Five	10.	Risk array
11.	Risk scenarios	12.	Calendar spread
13.	Last day	14.	10%
15.	Case to case		

12.8 Further Readings

Books

Derivatives Market NCFM Module. National Stock Exchange India Limited Publications: Bombay: 2007.

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Online links

http://derivativesindia.com

http://derivativesindia.com/scripts/glossary/index.aricles_e-articles

http://www.margrabe.com/Dictionary/derivatives/html

http://www.sebi.gov.in

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Unit 13: Regulatory Framework

Notes

CONTENTS

Objectives
Introduction
13.1 Regulation for Derivatives Trading
13.2 L. C. Gupta Committee Report
13.3 J. R. Varma Committee Report
13.3.1 Estimation of Volatility (Clause 2.1)
13.3.2 Calendar Spreads (Clause 2.2)
13.3.3 Trader Net Worth (Clause 2.3)
13.3.4 Margin Collection and Enforcement (Clause 2.4)
13.3.5 Clearing Corporation (Clause 2.5)
13.3.6 Position Limit (Clause 2.6)
13.3.7 Margining System (Clause 3.1)
13.3.8 Initial Margin Fixation Methodology (Clause 3.2)
13.3.9 Daily Changes in Margins (Clause 3.3)
13.3.10 Margining for Calendar Spreads (Clause 3.4)
13.3.11 Margin Collection and Enforcement (Clause 3.5)
13.3.12 Transparency and Disclosure (Clause 3.6)
13.4 Securities Contracts (Regulation) Act
13.4.1 Recognition of stock exchanges
13.4.2 Contracts in Securities
13.4.3 Listing of Securities
13.4.4 Securities Contracts (Regulation) Rules, 1957
13.5 Summary
13.6 Keywords
13.7 Review Questions
13.8 Further Readings

Objectives

After studying this unit, you should be able to:

- Discuss about the regulation for derivatives trading;
- Explain the L. C. Gupta committee report;
- Describe the J. R Varma committee report;
- Explain the Securities Contracts (Regulation) Act.

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Introduction

In the previous unit, you have studied about the risks associated with derivative activities, risk management systems and features of risk containment mechanism on the F&O segment. We also discussed about the objective of NSCCL-SPAN, types of margins, SPAN approach of computing initial margins, mechanics of SPAN, adjustments for corporate actions and margining system.

This unit will help you to understand the rules and regulations in derivatives trading and five main Acts governing the securities markets. We will also learn about the important recommendations made by the Dr. L. C. Gupta Committee on the introduction of derivatives markets in India and recommendations covered by J. R. Varma committee report. Further, we will end up the unit with discussion with the Securities Contracts (Regulation) Act, 1956 [SC(R) A] that was enacted to prevent undesirable transactions in securities. To make the learning easier, we will take the help of globally recognised best practices.

The SEBI is entrusted to regulate the carry-forward trading on stock market and other financial derivatives like equity stock, stock index, options, etc. through recognised stock exchanges of the country. Over-the-counter (OTC) forward contracts and options on foreign currencies are regulated by the Reserve Bank of India (RBI).

13.1 Regulation for Derivatives Trading

Rules and regulations in derivatives trading serve an important purpose to sustain confidence in the financial market, to enable a common framework for listed companies and to protect minority stakeholders such as retail investors. The regulatory committee believes that regulation should be designed to achieve specific, well-defined goals. It is inclined towards positive regulation designed to encourage healthy activity and behavior.

Notes At present, the five main Acts governing the securities markets are (a) the SEBI Act, 1992; (b) the Companies Act, 1956, which sets the code of conduct for the corporate sector in relation to issuance, allotment, and transfer of securities, and disclosures to be made in public issues; (c) the Securities Contracts (Regulation) Act, 1956, which provides for the regulation of transactions in securities through control over stock exchanges; (d) the Depositories Act, 1996 which provides for electronic maintenance and transfer of ownership of demat (dematerialised) shares; and (e) the Prevention of Money Laundering Act, 2002.

Now let us discuss these Acts in detail:

1. ***The SEBI Act, 1992:*** The SEBI Act, 1992 was enacted to empower SEBI with statutory powers for (a) protecting the interests of investors in securities, (b) promoting the development of the securities market, and (c) regulating the securities market. Its regulatory jurisdiction extends over corporate in the issuance of capital and transfer of securities, in addition to all intermediaries and persons associated with the securities market. It can conduct enquiries, audits, and inspection of all concerned, and adjudicate offences under the Act. It has the powers to register and regulate all market intermediaries, as well as to penalise them in case of violations of the provisions of the Act, Rules, and Regulations made thereunder.

Notes

Did u know? SEBI has full autonomy and the authority to regulate and develop an orderly securities market.

2. ***Securities Contracts (Regulation) Act, 1956:*** This Act provides for the direct and indirect control of virtually all aspects of securities trading and the running of stock exchanges, and aims to prevent undesirable transactions in securities. It gives the Central Government regulatory jurisdiction over (a) stock exchanges through a process of recognition and continued supervision, (b) contracts in securities, and (c) the listing of securities on the stock exchanges. As a condition of recognition, a stock exchange complies with the conditions prescribed by the Central Government. Organised trading activity in securities takes place on a specified recognised stock exchange. The stock exchanges determine their own listing regulations, which have to conform to the minimum listing criteria set out in the Rules.

3. ***Depositories Act, 1996:*** The Depositories Act, 1996 provides for the establishment of depositories in securities with the objective of ensuring free transferability of securities with speed, accuracy, and security by (a) making securities of public limited companies freely transferable, subject to certain exceptions; (b) dematerialising the securities in the depository mode; and (c) providing for the maintenance of ownership records in a book entry form. In order to streamline the settlement process, the Act envisages the transfer of ownership of securities electronically by book entry, without making the securities move from person to person. The Act has made the securities of all public limited companies freely transferable, restricting the company's right to use discretion in effecting the transfer of securities, and the transfer deed and other procedural requirements under the Companies Act have been dispensed with.

4. ***Companies Act, 1956:*** It deals with the issue, allotment, and transfer of securities, as well as various aspects relating to company management. It provides the standard of disclosure in public issues of capital, particularly in the fields of company management and projects, information about other listed companies under the same management, and the management's perception of risk factors. It also regulates underwriting, the use of premium and discounts on issues, rights, and bonus issues, the payment of interest and dividends, the supply of annual reports, and other information.

5. ***Prevention of Money Laundering Act, 2002:*** The primary objective of this Act is to prevent money laundering, and to allow the confiscation of property derived from or involved in money laundering.

Caution According to the definition of "money laundering," anyone who acquires, owns, possess, or transfers any proceeds of crime, or knowingly enters into any transaction that is related to the proceeds of crime either directly or indirectly, or conceals or aids in the concealment of the proceeds or gains of crime within India or outside India commits the offence of money laundering.

Besides prescribing the punishment for this offence, the Act provides other measures for the prevention of money laundering. The Act also casts an obligation on the intermediaries, the banking companies, etc. to furnish information of such prescribed transactions to the Financial Intelligence Unit-India, to appoint a principal officer, to maintain certain records, etc.

Notes

Caselet

SEBI (Alternative Investment Funds) Regulations 2011

On August 1, 2011, the Securities and Exchange Board of India (SEBI) issued a concept paper discussing the proposed introduction of the SEBI (Alternative Investment Funds) Regulations, 2011 (AIF Regulations) for public comments. At present, the Investment Management Regulation is limited to the Mutual Fund Regulation, the Collective Investments Schemes Regulations, the Venture Capital Funds Regulation, and the Regulation of Portfolio Managers. There is a need to recognise Alternative Investment Funds (AIF) such as PEs or VCs as asset classes that are distinct from promoter holdings, creditors, and public investors.

The salient provisions of the proposed SEBI (Alternative Investment Fund) Regulations that would register and regulate the formation of investment funds, which raises capital from a number of high net worth investors with a view to investing in accordance with a defined investment policy for the benefit of those investors, are as follows:

- The SEBI (Venture Capital Funds) Regulations, 1996 shall be replaced by the SEBI (AIF) Regulations, 2011.
- All categories of AIFs such as (a) Private Equity Fund, (b) Venture Capital Fund, (c) Private Investment in Pubic Equity (PIPE) Fund, (d) Debt Fund, (e) Infrastructure Fund, (f) Real Estate Fund, (g) Social Venture Fund, (h) Small and Medium Enterprises (SMEs) Fund, and (i) Strategy Fund are mandatorily required to obtain a certificate of registration from the SEBI. The funds already registered under the VCF Regulations would continue to be regulated by the same regulations until the existing fund or scheme is wound up.
- The AIF will be required to state the size of the fund, its investment strategy, investment purpose, and business model in an information memorandum to the investors.
- The minimum size of the AIF has to be ₹ 200 million. However, the fund size can be revised upward (up to 25 percent) after providing suitable reasons to the SEBI. The minimum investment amount would be specified as 0.1 percent of the fund size, subject to a minimum floor of ₹ 10 million. The AIF Regulations require the sponsor of the fund to commit to invest at least 5 percent of the fund, which shall be locked-in till the redemption by all investors.
- All AIFs are required to be close-ended, and the duration of the fund shall be determined at the time of registration. The tenure of the fund shall be for a minimum period of five years, and an extension of up to two years may be granted if consent for such extension is obtained from 75 percent of the beneficiaries. The fund has to be liquidated within one year following the maturity of the fund term, and all unliquidated investments need to be acquired by the AIF's sponsor.
- The AIFs are not permitted to invest in (i) NBFC (excluding Infrastructure Finance Company, Asset Finance Company, Core Investment Company, or companies engaged in microfinance activity, if the AIF is not a strategy fund), (ii) gold financing, (iii) activities not permitted under the Industrial Policy of the Government of India, and (iv) any other activity that may be specified by the SEBI. An AIF that has been granted registration under a particular category cannot change its category after registration. An AIF shall not invest more than 25 percent of the fund in one Investee Company.

Source:_http://www.nseindia.com/content/us/ismr_full2011.pdf

Notes

The regulatory framework in India is based on the L. C. Gupta Committee Report, and the J. R. Varma Committee Report. It is mostly consistent with the IOSCO5 principles and addresses the common concerns of investor protection, market efficiency and integrity and financial integrity. The L. C. Gupta Committee Report provides a perspective on division of regulatory responsibility between the exchange and the SEBI. It recommends that SEBI's role should be restricted to approving rules, bye laws and regulations of a derivatives exchange as also to approving the proposed derivatives contracts before commencement of their trading.

It emphasises the supervisory and advisory role of SEBI with a view to permitting desirable flexibility, maximising regulatory effectiveness and minimising regulatory cost. Regulatory requirements for authorisation of derivatives brokers/dealers include relating to capital adequacy, net worth, certification requirement and initial registration with SEBI. It also suggests establishment of a separate clearing corporation, maximum exposure limits, mark to market margins, margin collection from clients and segregation of clients' funds, regulation of sales practice and accounting and disclosure requirements for derivatives trading. The J. R. Varma committee suggests a methodology for risk containment measures for index-based futures and options, stock options and single stock futures. We will discuss them in the following sections.

Notes The risk containment measures include calculation of margins, position limits, exposure limits and reporting and disclosure.

Self Assessment

Fill in the blanks:

1. The derivatives can be classified into two categories: …… derivatives and …… derivatives.
2. At present there are …… main Acts governing the securities markets.
3. …… has full autonomy and the authority to regulate and develop an orderly securities market.
4. The primary objective of …… is to prevent money laundering.
5. The …… Report provides a perspective on division of regulatory responsibility between the exchange and the SEBI.

13.2 L. C. Gupta Committee Report

SEBI appointed L. C. Gupta Committee on 18th November 1996 to develop appropriate regulatory framework for the derivatives trading and to recommend suggestive bye-laws for Regulation and Control of Trading and Settlement of Derivatives Contracts. The Committee was also to focus on the financial derivatives and equity derivatives. The Committee submitted its report in March 1998.

The Board of SEBI in its meeting held on May 11, 1998 accepted the recommendations and approved the introduction of derivatives trading in India beginning with Stock Index Futures. The Board also approved the "Suggestive Bye-laws" recommended by the L. C Gupta Committee for Regulation and Control of Trading and Settlement of Derivatives Contracts. SEBI circulated the contents of the Report in June 98.

Notes

The L. C. Gupta Committee had conducted a wide market survey with contact of several entities relevant to derivatives trading like brokers, mutual funds, banks/FIs, FIIs and merchant banks. The Committee observation was that there is a widespread recognition of the need for derivatives products including Equity, Interest Rate and Currency derivatives products. However, Stock Index Futures is the most preferred product followed by stock index options. Options on individual stocks are the third in the order of preference. The participants took interviews, mostly stated that their objective in derivative trading would be hedging, but there were also a few interested in derivatives dealing for speculation or dealing. The Committee believes that regulation should be designed to achieve specific, well-defined goals. It is inclined towards positive regulation designed to encourage healthy activity and behaviour. Let us have a brief view of the important recommendations made by the Dr. L. C. Gupta Committee on the introduction of derivatives markets in India. These are as under:

1. The Committee is strongly of the view that there is urgent need of introducing of financial derivatives to facilitate market development and hedging in a most cost-efficient way against market risk by the participants such as mutual funds and other investment institutions.
2. There is need for equity derivatives, interest rate derivatives and currency derivatives.
3. Futures trading through derivatives should be introduced in phased manner starting with stock index futures, which will be followed by options on index and later options on stocks. It will enhance the efficiency and liquidity of cash markets in equities through arbitrage process.
4. There should be two-level regulation (regulatory framework for derivatives trading), i.e., exchange level and SEBI level. Further, there must be considerable emphasis on self regulatory competence of derivative exchange under the overall supervision and guidance of SEBI.
5. The derivative trading should be initiated on a separate segment of existing stock exchanges having an independent governing council. The number of the trading members will be limited to 40 percent of the total number. The Chairman of the governing council will not b trade on any of the stock exchanges.
6. The settlement of derivatives will be through an independent clearing Corporation/ Clearing house, which will become counterparty for all trades or alternatively guarantees the settlement of all trades. The clearing corporation will have adequate risk containment measures collect margins through EFT.
7. The derivatives exchange will have on-line-trading and adequate surveillance systems. It will disseminate trade and price information on real time basis through two information networks. It should inspect 100 percent of members every year.
8. There will be complete segregation of client money at the level of trading/clearing even at the level of clearing corporation.
9. The trading and clearing member will have stringent eligibility conditions. At least two persons should have passed the certification programme approved by the SEBI.
10. The clearing members should deposit minimum ₹ 50 lakh with clearing corporation and should have a net worth of ₹ 3 crore.
11. Removal of the regulatory prohibition on the use of derivatives by mutual funds while making the trustees responsible to restrict the use of derivatives by mutual funds only to hedging and portfolio balancing and not for specification.

Notes

12. The operations of the cash market on which the derivatives market will be based, need improvement in many respects.
13. Creation of a Derivation Cell, a Derivative Advisory Committee, and Economic Research Wing by SEBl.
14. Declaration of derivatives as 'securities' under Section 2 (h) of the SCRA and suitable amendments in the notification issued by the Central Government in June, 1969 under Section 16 of the SCRA.

The SEBI Board approved the suggested Bye-Laws recommended by the L. C. Gupta Committee for regulation and control of trading and settlement of derivatives contracts.

Task Find out the amendment to the SEBI (Issue of Capital and Disclosure Requirements) Regulations, 2009 for revision of Bid-cum-Application Form and Abridged Prospectus.

Self Assessment

State whether the following statements are true or false:

6. RBI appointed L. C. Gupta Committee on 18th November 1996 to develop appropriate regulatory framework for the derivatives trading
7. The L. C. Gupta Committee had conducted a wide market survey with contact of several entities relevant to derivatives trading like brokers, mutual funds, banks/FIs, FIIs and merchant banks.
8. The Dr. L. C. Gupta Committee is strongly of the view that there is urgent need of introducing of financial derivatives.
9. In Dr. L. C. Gupta Committee the derivative trading should be initiated on a separate segment of existing stock exchanges having an independent governing council.

13.3 J. R. Varma Committee Report

Accordingly, SEBI constituted a group in June, 1998, with Prof. J. R. Varma, as Chairman. The group submitted its report in the same year. The group began by enumerating the risk containment issues that assume importance in the Indian context while setting up an index futures market. The recommendations of the group as covered by its report are as under:

13.3.1 Estimation of Volatility (Clause 2.1)

Different people have different definitions for volatility. For our purpose, we can say that volatility essentially refers to uncertainty arising out of price changes of shares. It is important to understand the meaning of volatility a little more closely because it has a major bearing on how margins are computed. Several issues arise in the estimation of volatility:

1. Volatility in Indian market is quite high as compared to developed markets.
2. The volatility in Indian market is not constant and is varying over time.
3. The statistics on the volatility of the index futures markets do not exist (as these markets are yet to be introduced), and therefore, in the initial period, reliance has to be made on the volatility in the underlying securities market. The LCGC has prescribed that no cross margining would be permitted and separate margins would be charged on the position in

Notes

the futures market and the underlying securities market. In the absence of cross margining, index arbitrage would be costly, and therefore, possibly inefficient.

13.3.2 Calendar Spreads (Clause 2.2)

In developed markets, calendar spreads are essentially a play on interest rates with negligible stock market exposure. As such margins for calendar spreads are very low. However, in India the calendar basis risk could be high because of the absence of efficient index arbitrage and the lack of channels for the flow of funds from the organised money market into the index future market.

13.3.3 Trader Net Worth (Clause 2.3)

Even an accurate 99 percent "value at risk" model would give rise to end of day mark to market losses exceeding the margin approximately once every six months. Trader net worth provides an additional level of safety to the market and works as a deterrent to the incidence of defaults. A member with high net worth would try harder to avoid defaults as his own net worth would be at stake. The definition of net worth needs to be made precise having regard to prevailing accounting practices and laws.

13.3.4 Margin Collection and Enforcement (Clause 2.4)

Apart from the correct calculation of margin, the actual collection of margin is also of equal importance. Since initial margins can be deposited in the form of bank guarantee and securities, the risk containment issues in regard to these need to be tackled.

13.3.5 Clearing Corporation (Clause 2.5)

The clearing corporation provides novation and becomes the counter party for each trade. In the circumstances, the credibility of the clearing corporation assumes importance and issues of governance and transparency need to be addressed.

13.3.6 Position Limit (Clause 2.6)

It may be necessary to prescribe position limits for the market as a whole and for the individual clearing member/trading member/client.

13.3.7 Margining System (Clause 3.1)

Prices of shares keep on moving every day. Margins ensure that buyers bring money and sellers bring shares to complete their obligations even though the prices have moved down or up. Let us discuss in the following clauses:

- ***Mandating margin methodology not specific margins (Clause 3.1.1):*** The LCGC recommended that margins in the derivatives markets would be based on a 99 percent Value at Risk (VAR) approach. The group discussed ways of operationalising this recommendation keeping in mind the issues relating to estimation of volatility discussed in 2.1. It is decided that the SEBI should authorise the use of a particular VAR estimation methodology but should not mandate a specific minimum margin level. The specific recommendations of the group are as follows:
- ***Initial methodology (Clause 3.1.2):*** The group has evaluated and approved a particular risk estimation methodology. The derivatives exchange and clearing corporation should be authorised to start index futures trading using this methodology for fixing margins.

Notes

- ***Continuous refining (Clause 3.1.3):*** The derivatives exchange and clearing corporation should be encouraged to refine this methodology continuously on the basis of further experience. Any proposal for changes in the methodology should be filed with SEBI and released to the public for comments along with detailed comparative back testing results of the proposed methodology and the current methodology. The proposal shall specify the date from which the new methodology will become effective and this effective date shall not be less than three months after the date of filing with SEBI. At any time up to two weeks before the effective date, SEBI may instruct the derivatives exchange and clearing corporation not to implement the change, or the derivatives exchange and clearing corporation may on its own decide not to implement the change.

13.3.8 Initial Margin Fixation Methodology (Clause 3.2)

The group took on record the estimation and back testing results provided by Prof. Varma from his ongoing research work on value at risk calculations in Indian financial markets. The group, being satisfied with these back testing results, recommends the following margin fixation methodology as the initial methodology for the purposes of Clause 3.1.1.

The exponential moving average method would be used to obtain the volatility estimate every day.

13.3.9 Daily Changes in Margins (Clause 3.3)

The group recommends that the volatility estimated at the end of the day's trading would be used in calculating margin calls at the end of the same day. This implies that during the course of trading, market participants would not know the exact margin that would apply to their position. It was agreed, therefore, that the volatility estimation and margin fixation methodology would be clearly made known to all market participants so that they can compute what the margin would be for any given closing level of the index. It was also agreed that the trading software would itself provide this information on a real time basis on the trading workstation screen.

13.3.10 Margining for Calendar Spreads (Clause 3.4)

The group took note of the international practice of levying very low margins on calendar spreads. A calendar spread is a position at one maturity which is hedged by an offsetting position at a different maturity.

Example: A short position in the six month contract coupled with a long position in the nine month contract. The justification for low margins is that a calendar spread is not exposed to the market risk in the underlying at all. If the underlying rises, one leg of the spread loses money while the other gains money resulting in a hedged position. Standard futures pricing models state that the futures price is equal to the cash price plus a net cost of carry (interest cost reduced by dividend yield on the underlying). This means that the only risk in a calendar spread is the risk that the cost of carry might change; this is essentially an interest rate risk in a money market position. In fact, a calendar spread can be viewed as a synthetic money market position.

The above example of a short position in the six month contract matched by a long position in the nine month contract can be regarded as a six month future on a three month T-bill. In developed financial markets, the cost of carry is driven by a money market interest rate and the risk in calendar spreads is very low.

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In India, however, unless banks and institutions enter the calendar spread in a big way, it is possible that the cost of carry would be driven by an unorganised money market rate as in the case of the badla market. These interest rates could be highly volatile.

Given the evidence that the cost of carry is not an efficient money market rate, prudence demands that the margin on calendar spreads be far higher than international practice. Moreover, the margin system should operate smoothly when a calendar spread is turned into a naked short or long position on the index either by the expiry of one of the legs or by the closing out of the position in one of the legs. The group therefore recommends that:

- The margin on calendar spreads is levied at a flat rate of 0.5% per month of spread on the far month contract of the spread subject to a minimum margin of 1% and a maximum margin of 3% on the far side of the spread for spreads with legs up to 1 year apart. A spread with the two legs three months apart would thus attract a margin of 1.5% on the far month contract.
- The margining of calendar spreads is reviewed at the end of six months of index futures trading.
- A calendar spread should be treated as a naked position in the far month contract as the near month contract approaches expiry. This change should be affected in gradual steps over the last few days of trading of the near month contract. Specifically, during the last five days of trading of the near month contract, the following percentages of a calendar spread shall be treated as a naked position in the far month contract: 100% on day of expiry, 80% one day before expiry, 60% two days before expiry, 40% three days before expiry, 20% four days before expiry. The balance of the spread shall continue to be treated as a spread. This phasing in will apply both to margining and to the computation of exposure limits.
- If the closing out of one leg of a calendar spread causes the members' liquid net worth to fall below the minimum levels, his terminal shall be disabled and the clearing corporation shall take steps to liquidate sufficient positions to restore the members' liquid net worth to the levels mandated.
- The derivatives exchange should explore the possibility that the trading system could incorporate the ability to place a single order to buy or sell spreads without placing two separate orders for the two legs.
- For the purposes of the exposure limit, a calendar spread shall be regarded as an open position of one third of the mark to market value of the far month contract. As the near month contract approaches expiry, the spread shall be treated as a naked position in the far month contract.

13.3.11 Margin Collection and Enforcement (Clause 3.5)

Apart from the correct calculation of margin, the actual collection of margin is also of equal importance. The group recommends that the clearing corporation should lay down operational guidelines on collection of margin and standard guidelines for back office accounting at the clearing member and trading member level to facilitate the detection of non-compliance at each level.

13.3.12 Transparency and Disclosure (Clause 3.6)

The group recommends that the clearing corporation/clearing house shall be required to disclose the details of incidences of failures in collection of margin and/or the settlement dues at least on a quarterly basis.

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Notes Failure for this purpose means a shortfall for three consecutive trading days of 50% or more of the liquid net worth of the member.

Self Assessment

Choose the correct answer from the following options:

10. The regulatory framework for the derivatives market in India has been developed by which of the following?
    (a) L. C. Gupta committee
    (b) J. R. Varma Committee
    (c) A. C. Gupta Committee
    (d) None of the above
11. As per the requirement of SEBI, derivatives exchange must have a minimum of how many members?
    (a) 100
    (b) 50
    (c) 75
    (d) 25
12. The minimum net worth for clearing members of the derivatives clearing corporation/ house shall be:
    (a) ₹ 300 lakh
    (b) ₹ 250 lakh
    (c) ₹ 500 lakh
    (d) None of the above

13.4 Securities Contracts (Regulation) Act

The Securities Contracts (Regulation) Act, 1956 [SC(R)A] was enacted to prevent undesirable transactions in securities by regulating the business of dealing therein and by providing for certain other matters connected therewith. This is the principal Act, which governs the trading of securities in India.

The definitions of some of the important terms are given below:

'Recognised Stock Exchange' means a stock exchange, which is for the time being recognised by the Central Government under Section 4 of the SC(R)A.

Did u know? *'Stock Exchange'* means anybody of individuals, whether incorporated or not, constituted for the purpose of assisting, regulating or controlling the business of buying, selling or dealing in securities.

Notes

As per Section 2(h), the term "securities" include:

(i) Shares, scrips, stocks, bonds, debentures, debenture stock or other marketable securities of a like nature in or of any incorporated company or other body corporate,

(ii) Derivative,

(iii) Units or any other instrument issued by any collective investment scheme to the investors in such schemes,

(iv) Security receipts

(v) Government securities,

(vi) Such other instruments as may be declared by the Central Government to be securities, and

(vii) Rights or interests in securities.

As per section 2(aa), **"Derivative"** includes:

(a) A security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or contract for differences or any other form of security;

(b) A contract which derives its value from the prices, or index of prices, of underlying securities;

Section 18A provides that notwithstanding anything contained in any other law for the time being in force, contracts in derivative shall be legal and valid if such contracts are:

(i) Traded on a recognised stock exchange;

(ii) Settled on the clearing house of the recognised stock exchange, in accordance with the rules and bye-laws of such stock exchanges.

"**Spot delivery contract**" has been defined in Section 2(i) to mean a contract which provides for:

(a) Actual delivery of securities and the payment of a price therefore either on the same day as the date of the contract or on the next day, the actual period taken for the dispatch of the securities or the remittance of money therefore through the post being excluded from the computation of the period aforesaid if the parties to the contract do not reside in the same town or locality;

(b) Transfer of the securities by the depository from the account of a beneficial owner to the account of another beneficial owner when such securities are dealt with by a depository.

The SC(R)A deals with-

1. Stock exchanges, through a process of recognition and continued supervision,
2. Contracts in securities, and
3. Listing of securities on stock exchanges.

13.4.1 Recognition of Stock Exchanges

By virtue of the provisions of the Act, the business of dealing in securities cannot be carried out without registration from SEBI. Any Stock Exchange which is desirous of being recognised has to make an application under Section 3 of the Act to SEBI, which is empowered to grant recognition and prescribe conditions. This recognition can be withdrawn in the interest of the trade or public. SEBI is authorised to call for periodical returns from the recognised Stock Exchanges and make enquiries in relation to their affairs. Every Stock Exchange is obliged to furnish annual reports to SEBI.

Notes

Notes Recognised Stock Exchanges are allowed to make bylaws for the regulation and control of contracts but subject to the previous approval of SEBI and SEBI has the power to amend the said bylaws.

The Central Government and SEBI have the power to supersede the governing body of any recognised stock exchange.

13.4.2 Contracts in Securities

Organised trading activity in securities takes place on a recognised stock exchange. If the Central Government is satisfied, having regard to the nature or the volume of transactions in securities in any State or area, that it is necessary so to do, it may, by notification in the Official Gazette, declare provisions of section 13 to apply to such State or area, and thereupon every contract in such State or area which is entered into after date of the notification otherwise than between members of a recognised stock exchange in such State or area or through or with such member shall be illegal. The effect of this provision clearly is that if a transaction in securities has to be validly entered into, such a transaction has to be either between the members of a recognised stock exchange or through a member of a Stock Exchange.

13.4.3 Listing of Securities

Where securities are listed on the application of any person in any recognised stock exchange, such person shall comply with the conditions of the listing agreement with that stock exchange (Section 21). Where a recognised stock exchange acting in pursuance of any power given to it by its bye-laws, refuses to list the securities of any company, the company shall be entitled to be furnished with reasons for such refusal and the company may appeal to Securities Appellate Tribunal (SAT) against such refusal.

13.4.4 Securities Contracts (Regulation) Rules, 1957

The Central Government has made Securities Contracts (Regulation) Rules, 1957, as required by sub-section (3) of the Section 30 of the Securities Contracts (Regulation) Act, 1956 for carrying out the purposes of that Act. The powers under the SC(R)R, 1957 are exercisable by SEBI.

Contracts between members of recognised stock exchange: All contracts between the members of a recognised stock exchange shall be confirmed in writing and shall be enforced in accordance with the rules and byelaws of the stock exchange of which they are members (Rule 9).

Books of account and other documents to be maintained and preserved by every member of a recognised stock exchange:

1. Every member of a recognised stock exchange shall maintain and preserve the following books of account and documents for a period of five years:
   - (a) Register of transactions (Sauda book).
   - (b) Clients' ledger.
   - (c) General ledger.
   - (d) Journals.
   - (e) Cash book.

Notes

(f) Bank pass-book.

(g) Documents register showing full particulars of shares and securities received and delivered.

2. Every member of a recognised stock exchange shall maintain and preserve the following documents for a period of two years:

(a) Members' contract books showing details of all contracts entered into by him with other members of the same exchange or counter-foils or duplicates of memos of confirmation issued to such other members.

(b) Counter-foils or duplicates of contract notes issued to clients.

(c) Written consent of clients in respect of contracts entered into as principals. (Rule 15)

Self Assessment

Choose the correct answer from the following options:

13. The dealer/broker and sales persons in the F&O segment shall be required to pass which of the following examinations?

(a) MBA (Finance)

(b) Chartered Accountancy

(c) Certified Financial Analyst

(d) NCFM

14. Which of the following Acts governs trading of derivatives in India?

(a) Securities Contracts (Regulation) Act, 1956

(b) SEBI Act, 1992

(c) Capital Issues (Control) Act, 1947

(d) Depositories Act, 1956

15. A clearing member of F&O segment is required to have a net worth of and keep collateral security deposit of:

(a) ₹ 3 Crore, 50 lakh.

(b) ₹ 5 Crore, 50 lakh.

(c) ₹ 3 Crore, 80 lakh.

(d) ₹ 5 Crore, 10 lakh.

Case Study

NSE in Indian Securities Market

The National Stock Exchange of India (NSE) was recognised as a stock exchange in April 1993. NSE was set up with the objectives of (a) establishing a nationwide trading facility for all types of securities; (b) ensuring equal access to all investors across the country through an appropriate communication network; (c) providing a fair,

Contd.....

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efficient, and transparent securities market using an electronic trading system, (d) enabling shorter settlement cycles and book entry settlements; and (e) meeting the international benchmarks and standards. Within a short span of time, these objectives have been realised, and the Exchange has played a leading role in transforming the Indian Capital Market to its present form.

NSE has set up an infrastructure that serves as a role model for the securities industry in terms of trading systems, and clearing and settlement practices and procedures. The standards set by NSE in terms of market practices, products, technology, and service standards have become industry benchmarks, and are being replicated by other market participants. It provides a screen-based automated trading system with a high degree of transparency and equal access to investors irrespective of geographical location. The high level of information dissemination through its online system has helped in integrating retail investors on a national basis. NSE has been playing the role of a catalytic agent in reforming the market in terms of microstructure and market practices.

Right from its inception, the Exchange has adopted the purest form of a demutualised setup, whereby the ownership, management, and trading rights are in the hands of three different sets of people. This has completely eliminated any conflicts of interest and has helped NSE to aggressively pursue policies and practices within a public interest framework. It has helped in shifting the trading platform from the trading hall in the premises of the exchange to the computer terminals at the premises of the trading members located across the country, and subsequently, to the personal computers in the homes of investors. Settlement risks have been eliminated with NSE's innovative endeavors in the area of clearing and settlement, namely, the reduction of the settlement cycle, professionalisation of the trading members, a fine-tuned risk management system, the dematerialisation and electronic transfer of securities, and the establishment of a clearing corporation.

Consequently, the market today uses state-of-the-art technology to provide an efficient and transparent trading, clearing, and settlement mechanism. NSE provides a trading platform for of all types of securities—equity, debt, and derivatives. Following its recognition as a stock exchange under the Securities Contracts (Regulation) Act, 1956 in April 1993, it commenced operations in the Wholesale Debt Market (WDM) segment in June 1994, in the Capital Market (CM) segment in November 1994, and in the Equity Derivatives segment in June 2000. The Exchange started providing trading in retail debt of government securities in January 2003, and trading in currency futures in August 2008.

NSE started providing trading in currency option in October 2010 and launched futures & options contracts based on global indices S&P 500 and DJIA in August 2011. The WDM segment provides the trading platform for the trading of a wide range of debt securities. Its product, the FIMMDA NSE MIBID/MIBOR—which is now disseminated jointly with the FIMMDA—is used as a benchmark rate for the majority of the deals struck for Interest Rate Swaps, Forwards Rate Agreements, Floating Rate Debentures, and Term Deposits in the country. Its Zero Coupon Yield Curve as well as the NSE-VaR for Fixed Income Securities have also become very popular for the valuation of sovereign securities across all maturities irrespective of liquidity, and have facilitated the pricing of corporate papers and the GOI Bond Index.

NSE's Capital Market segment offers a fully automated screen-based trading system, known as the National Exchange for Automated Trading (NEAT) system, which operates on a strict price/time priority. It enables members from across the country to trade simultaneously with enormous ease and efficiency. NSE's Equity Derivatives segment provides the trading of a wide range of derivatives such as Index Futures, Index Options,

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Stock Options, Stock Futures, and futures on global indices such as S&P 500 and DJIA. NSE's Currency Derivatives segment provides the trading of currency futures contracts on the USD-INR, which commenced on August 29, 2008. In February 2010, trading in additional pairs such as the GBP-INR, the EUR-INR, and the JPY-INR was allowed, while USD-INR currency options were allowed for trading on October 29, 2010. The interest rate futures trade on the currency derivatives segment of the NSE, and they were allowed for trading on August 31, 2009.

Table 1: Market Segments on the NSE for 2010-2011—Selected Indicators

Segments	No. of securities traded/ No. of contracts available for trading	Market Capitalisation as of March 2011		Trading Value for 2010-11		Market Share (%)
		₹ mn	US $ mn	₹ mn	US$ mn	
CM	1,935	67,026,156	1,501,146	35,774,098	801,212	76.36%
Equity F&O	32,272	-	-	292,482,211	6,550,553	100.00%
Currency F&O	226	-	-	34,497,877	772,629	41.04%
Total	**-**	**67,026,156**	**1,501,146**	**362,754,186**	**8,124,394**	**85.68%**

Source: SEBI, NSE

For CM segment, the number of securities traded is provided; for Equity F&O and currency F&O, the number of contracts available for trading as of March 2011 is provided.

Once again, the NSE registered as the market leader, with 85.68 percent of total turnover (volumes in cash market, equity derivatives, and currency derivatives) in 2010–2011. NSE proved itself the market leader, contributing a share of 76.36 percent in equity trading and nearly 100 percent share in the equity derivatives segment in 2010–2011 (Table).

Technology and Application Systems in NSE

Technology has been the backbone of the NSE. Providing the services to the investor community and the market participants using technology at the cheapest possible cost has been its main thrust. NSE chose to harness technology to create a new market design. The Exchange believes that technology provides the necessary impetus for an organisation to retain its competitive edge and to ensure timeliness and satisfaction in customer service. In recognition of the fact that technology will continue to redefine the shape of the securities industry, NSE stresses on innovation and sustained investment in technology to remain ahead of competition. The NSE is the first exchange in the world to use satellite communication technology for trading. It uses satellite communication technology to energise participation from about 2,100+ VSATs from nearly 174 cities spread across the country.

NSE's trading system, called the National Exchange for Automated Trading (NEAT), is a state-of-the-art client-server based application. At the server end, all trading information is stored in an in-memory database to achieve minimum response time and maximum system availability for users. It has an uptime record of 99.999 percent. For all trades entered into the NEAT system, there is a uniform response time in the range of milliseconds. NSE has been continuously undertaking capacity enhancement measures in order to effectively meet the requirements of the increasing number of users and the associated trading loads.

NSE's Internet Based Information System (NIBIS) has also been put in place for online real-time dissemination of trading information over the Internet. As part of its business continuity plan, the NSE has established a disaster back-up site at along with its entire

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infrastructure, including the satellite earth station and a high-speed optical fiber link with its main site at Mumbai. This site is a replica of the production environment at Mumbai. The transaction data is backed up on near-real-time basis from the main site to the disaster back-up site through the 4 STM-4 (2.4 GB) high-speed links to keep both the sites synchronised with each other all the time.

Questions:

1. Analyse the case and write down the role of NSE in Indian securities market.
2. "Technology has been the backbone of the NSE". Discuss.

Source: http://www.nseindia.com/content/us/ismr_full2011.pdf**Case: Developing-a-career-path-in-retail**

13.5 Summary

- The four main legislations governing the securities market are: (a) the SEBI Act, 1992; (b) the Companies Act, 1956; (c) the Securities Contracts (Regulation) Act, 1956; and (d) the Depositories Act, 1996.
- Government has framed rules under the SCRA, SEBI Act and the Depositories Act.
- SEBI has framed regulations under the SEBI Act and the Depositories Act for registration and regulation of all market intermediaries, and for prevention of unfair trade practices, insider trading, etc.
- The responsibility for regulating the securities market is shared by Department of Economic Affairs (DEA), Department of Company Affairs (DCA), Reserve Bank of India (RBI) and SEBI.
- The activities of these agencies are coordinated by the High Level Committee on Capital Markets. Most of the powers under the SCRA are exercisable by DEA while a few others by SEBI.
- The powers of the DEA under the SCRA are also concurrently exercised by SEBI.
- The powers in respect of the contracts for sale and purchase of securities, gold related securities, money market securities and securities derived from these securities and ready forward contracts in debt securities are exercised concurrently by RBI.
- The SEBI Act and the Depositories Act are mostly administered by SEBI. The rules and regulations under the securities laws are administered by SEBI.
- The powers under the Companies Act relating to issue and transfer of securities and non-payment of dividend are administered by SEBI in case of listed public companies and public companies proposing to get their securities listed.
- The SROs ensure compliance with their own rules as well as with the rules.

13.6 Keywords

Calendar spread: Calendar spread is a spread trade involving the simultaneous purchase of futures or options expiring at particular date and the sale of the same instrument expiring another date.

Companies Act: It deals with the issue, allotment, and transfer of securities, as well as various aspects relating to company management.

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Depositories Act: The Depositories Act, 1996 provides for the establishment of depositories in securities with the objective of ensuring free transferability of securities with speed, accuracy, and security.

Margin: A margin is collateral that the holder of a financial instrument has to deposit to cover some or all of the credit risk of their counterparty (most often their broker or an exchange).

Over-the-counter (OTC): Over-the-counter (OTC) or off-exchange trading is done directly between two parties, without any supervision of an exchange.

Prevention of Money Laundering Act: The primary objective of this Act is to prevent money laundering, and to allow the confiscation of property derived from or involved in money laundering.

SEBI: The Securities and Exchange Board of India (SEBI) is the regulator for the securities market in India. It was established on 12 April 1992 through the SEBI Act, 1992.

Securities Contracts (Regulation) Act: This Act provides for the direct and indirect control of virtually all aspects of securities trading and the running of stock exchanges.

VaR Margin: VaR Margin is at the heart of margining system for the cash market segment.

13.7 Review Questions

1. What are the regulations for derivatives trading in India?
2. Write down the important recommendations made by the Dr. L. C. Gupta Committee on the introduction of derivatives markets in India.
3. When and why L.C. Gupta committee was set up?
4. Write down the recommendations covered by J.R. Varma committee report.
5. Briefly discuss the role of SEBI in the Indian Derivatives Market?
6. Briefly explain the Securities Contracts (Regulation) Act.
7. Explain the margining system of recommended in J.R. Varma committee report.
8. What is volatility? Write down the several issues arise in the estimation of volatility.
9. "Even an accurate 99 percent "value at risk" model would give rise to end of day mark to market losses exceeding the margin approximately once every six months." Explain how?

Answers: Self Assessment

1. Commodities, financial
2. Five
3. SEBI
4. Prevention of Money Laundering Act, 2002
5. L.C. Gupta Committee
6. False
7. True
8. True
9. True
10. a. L.C. Gupta committee
11. b. 50
12. a. ₹ 300 lakh
13. d. NCFM
14. a. Securities Contracts (Regulation) Act, 1956
15. a. ₹ 3 Crore, 50 lakh

13.8 Further Readings

Notes

Books

Derivatives Market NCFM Module. National Stock Exchange India Limited Publications: Bombay: 2007.

Gupta S. L. (2007). *Financial Derivatives.* Prentice Hall. New Delhi.

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2008. *Indian Stock Market Review.* National Stock Exchange Publications.

Online links

http://derivativesindia.com

http://derivativesindia.com/scripts/glossary/index.aricles_e-articles

http://www.margrabe.com/Dictionary/derivatives/html

http://www.sebi.gov.in

http://www.nseindia.com/f&o

Notes

Unit 14: Regulation and Securities Markets in India

CONTENTS

Objectives

Introduction

14.1 Securities Markets in India

14.1.1 Primary Market

14.1.2 Secondary Market

14.2 Securities Market Regulation in India

14.2.1 Components of Security Market

14.2.2 Cooperation in Regulation

14.2.3 Self-Regulation

14.3 Securities and Exchange Board of India Act, 1992

14.3.1 Constitution of Securities and Exchange Board of India (SEBI)

14.3.2 Functions of SEBI

14.4 Summary

14.5 Keywords

14.6 Review Questions

14.7 Further Readings

Objectives

After studying this unit, you should be able to:

- Discuss the securities markets in India;
- Describe the securities market regulation in India;
- Identify the components of security market;
- Explain the Securities and Exchange Board of India Act, 1992;
- Discuss the constitution of SEBI;
- State the functions of SEBI.

Introduction

In the previous unit, you have studied about the rules and regulations in derivatives trading and five main Acts governing the securities markets. We also discussed about the important recommendations made by the Dr. L.C. Gupta Committee on the introduction of derivatives markets in India and recommendations covered by J.R. Varma committee report. Also, we learned the Securities Contracts (Regulation) Act, 1956 [SC(R) A] that was enacted to prevent undesirable transactions in securities.

This unit will help you to understand about and regulations on securities markets in India. We will also learn about the Securities and Exchange Board of India Act, 1992. Further, we will end

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up the unit with discussion on constitution of SEBI and functions of SEBI. To make the learning easier, we will take the help of globally recognised best practices.

Financial markets have an important relationship with economic development. Regulation has been acknowledged to enable the orderly functioning of the securities market. The Securities and Exchange Board of India (SEBI) is the regulator charged with the orderly functioning of the securities market in India, protect the interests of investors and ensure development of the securities market. Since the establishment of SEBI in 1992, the Indian securities market has grown enormously in terms of volumes, new products and financial services.

The Indian securities market, considered one of the most promising emerging markets, is among the top eight markets of the world. The Stock Exchange, Mumbai, which was established in 1875 as "The Native Share and Stockbrokers Association" (a voluntary non-profit making association), has evolved over the years into its present status as the premier Stock Exchange in the country. At present 24 stock exchanges operate all over India. These stock exchanges provide facilities for trading securities; Securities markets provide a common platform for transfer of funds from the person who has excess funds to those who need them. Securities market is regulated by the Securities& Exchange Board of India (SEBI).

14.1 Securities Markets in India

The securities markets in India have witnessed several policy initiatives, which have refined the market micro-structure, modernised operations and broadened investment choices for the investors. Basically, Securities markets provide a channel for allocation of savings by an individual or an organisation to those who have a productive need for them.

Notes A security market can be said a location where the savers meet the real investors who need the fund.

The savers and investors are constrained by the economy's abilities to invest and save respectively which thus helps market in enhancing savings and investment in the economy. Stock Market is therefore affected by the dynamics of the economic, political, cultural and environmental activities within the country and rest of the world.

Did u know? The securities market has essentially three categories of participants, namely the issuers of securities, investors in securities and the intermediaries.

The issuers and investors are the consumers of services rendered by the intermediaries while the investors are consumers (they subscribe for and trade in securities) of securities issued by issuers. In pursuit of providing a product to meet the needs of each investor and issuer, the intermediaries churn out more and more complicated products. They educate and guide them in their dealings and bring them together. Those who receive funds in exchange for securities and those who receive securities in exchange for funds often need the reassurance that it is safe to do so. This reassurance is provided by the law and by custom, often enforced by the regulator. The regulator develops fair market practices and regulates the conduct of issuers of securities and the intermediaries so as to protect the interests of suppliers of funds. The regulator ensures a high standard of service from intermediaries and supply of quality securities and non-manipulated demand for them in the market.

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Did u know? Indian Share Market is the oldest Asian stock market incorporated in 1875.

The name of the first share trading association in India was Native Share and Stock Broker's Association which later came to be known as Bombay Stock Exchange. This association started with 318 members.

The National Stock Exchange (NSE) is India's latest exchange which commenced from June 30, 1994. The main objectives of the NSE are to provide speedy transactions, fast settlements and to benefit the small investors who find it difficult to sell shares at BSE.

The past decade has been quite remarkable for the Securities market in India with the boom in the economy fuelled by better banking system. It has grown exponentially and the market has also witnessed fundamental institutional changes. There have also been significant improvements in efficiency, transparency and safety.

The securities market has two interdependent and inseparable segments, the new issues (primary market) and the stock (secondary) market.

14.1.1 Primary Market

The primary market provides the channel for sale of new securities. Primary market provides opportunity to issuers of securities; government as well as corporate, to raise resources to meet their requirements of investment and/or discharge some obligation.

Did u know? An aggregate of ₹ 8,561,863 million (US $ 191,755 million) was raised by the government and the corporate sector in 2010–2011, compared to ₹ 10,083,446 million (US $ 223,382 million) in 2009–2010 (a decrease of 15.09 percent). Private placement accounted for 90.57 percent of the domestic total resource mobilisation by the corporate sector. Resource mobilisation through Euro Issues dropped significantly by 40.87 percent to ₹ 94,410 million (US $ 2,114 million) in 2010–2011.

14.1.2 Secondary Market

Secondary market refers to a market where securities are traded after being initially offered to the public in the primary market and/or listed on the Stock Exchange. Majority of the trading is done in the secondary market. Secondary market comprises of equity markets and the debt markets.

The secondary market enables participants who hold securities to adjust their holdings in response to changes in their assessment of risk and return. They also sell securities for cash to meet their liquidity needs. The secondary market has further two components, namely the over-the-counter (OTC) market and the exchange-traded market. OTC is different from the market place provided by the Over The Counter Exchange of India Limited. OTC markets are essentially informal markets where trades are negotiated. Most of the trades in government securities are in the OTC market. All the spot trades where securities are traded for immediate delivery and payment take place in the OTC market. The exchanges do not provide facility for spot trades in a strict sense.

Closest to spot market is the cash market where settlement takes place after some time. Trades taking place over a trading cycle, i.e. a day under rolling settlement, are settled together after a certain time (currently 2 working days). Trades executed on the National Stock Exchange of India Limited (NSE) are cleared and settled by a clearing corporation which provides novation

and settlement guarantee. Nearly 100% of the trades settled by delivery are settled in demat form. NSE also provides a formal trading platform for trading of a wide range of debt securities including government securities.

Did u know? The exchanges in the country offer screen-based trading system. There were 10,203 trading members registered with SEBI at the end of March 2011.

The market capitalisation has grown over the period, indicating that more companies are using the trading platform of the stock exchange. The market capitalisation across India was around ₹ 68,430,493 million (US $ 1,532,598 million) at the end of March 2011. Market capitalisation ratio is defined as the market capitalisation of stocks divided by the GDP. It is used as a measure that denotes the importance of equity markets relative to the GDP. It is of economic significance since the market is positively correlated with the ability to mobilise capital and diversify risk. The all-India market capitalisation ratio decreased to 86.89 percent in 2010–2011 from 94.2 percent in 2009–2010.

Notes The trading in non-repo government securities on NSE has been declining considerably since 2004–2005. The aggregate trading volumes in central and state government dated securities on SGL declined from ₹ 4,217,022 million (US $ 93,421 million) in 2009–2010 to ₹ 4,035,492 million (US $ 90,381 million) in 2010–2011.

The number of instruments available in derivatives has increased. To begin with, SEBI only approved trading in index futures contracts based on the Nifty 50 Index and the BSE 30 (SENSEX) Index. This was followed by approval for trading in options based on these indices and options on individual securities, as well as futures on interest rates derivative instruments.

Notes On the NSE, there are futures and options based on the benchmark index Nifty 50, CNX IT Index, Bank Nifty Index, and Nifty Midcap 50, as well as futures and options on 226 single stocks (as on October 30, 2011). On the BSE, futures and options are based on the BSE-30 (SENSEX), BSE TECk, BSE BANKEX, BSE Oil & Gas, and BSE SENSEX mini, as well as futures and options on 99 single stocks (as on October 30, 2011).

Self Assessment

Fill in the blanks:

1. At present …….. stock exchanges operate all over India.
2. …….. can be said a location where the savers meet the real investors who need the fund.
3. The securities market has essentially three categories of participants, namely the issuers of securities, …….. and the intermediaries.
4. Indian Share Market is the oldest …….. incorporated in 1875.
5. The securities market has two interdependent and inseparable segments, the new issues (primary market) and the …….. market.

Notes

14.2 Securities Market Regulation in India

A stable and efficient financial system provides the foundation for implementation of effective stabilisation policies, more accurate pricing of risk and more efficient use of capital. Efficiency of the financial system is governed by the role of markets in mobilising and allocating financial resources, in providing liquidity and payment services and in gathering information on which to base investment decisions. Stability, on the other hand, is concerned with safeguarding the value of liabilities of financial intermediaries that serve as stores of wealth. This also involves questions relating to prudential supervision, financial regulation and good governance. It needs to be added here that as financial systems get increasingly globalised, capital moves not only in response to competing monetary policies, but also to competing financial systems. Inefficient and unstable financial systems are therefore likely to be increasingly penalised.

In India, as in other parts of the world, securities regulations have evolved in the face of two apparently diverging trends. One relates to a move toward liberalisation of financial markets, which entails elimination of measures of financial repression such as direct controls on interest rates, mandatory investment in government securities, administrative pricing of securities and so on. The other force is toward stronger regulation. The need for stronger regulation comes to the fore since financial markets are characterised by significant asymmetries of information, which contribute to moral hazard and in extreme cases leads to market failure. In sum, an unregulated market can entail high systemic risk.

Notes The regulatory responsibility of the securities market is vested in the SEBI, the RBI, and two government departments - Department of Company Affairs and Department of Economic Affairs.

Investigative agencies such as Economic Offences Wing of the government and consumer grievance redressal forums also play a role. The SEBI, established under the SEBI Act, is the apex regulatory body for the securities market. Besides regulation, the SEBI's mandate includes responsibilities for ensuring investor protection and promoting orderly growth of the securities market. The RBI, on the other hand, is responsible for regulation of a certain well-defined segment of the securities market.

Caution As the manager of public debt, the RBI is responsible for primary issues of Government Securities.

The RBI's mandate also includes the regulation of all contracts in government securities, gold related securities, money market securities, and in securities derived from these securities. To foster consistency of the regulatory processes, the SEBI is mandated to regulate the trading of these securities on recognised stock exchanges in line with the guidelines issued by RBI. Although there is a clear division of regulatory responsibilities between RBI and SEBI, and efforts have been made to make the regulatory process consistent, the distribution of regulatory responsibilities among a number of institutions can potentially create confusion among the regulated as to which body is responsible for a particular area of regulation.

To ensure operational independence and accountability in the exercise of functions and powers by the regulators, SEBI and RBI have been constituted as autonomous bodies and are established under separate acts of the Parliament. Both regulators are accountable to the Parliament through Central Government and the regulations framed by them are required to be laid before Parliament by the Central Government. There is also a system of independent judicial review of the decisions

of SEBI and RBI. Although the SEBI and the RBI are operationally independent, the government can issue directions to both in policy matters.

14.2.1 Components of Security Market

The major components of the securities market are listed below:

- *Securities* - Shares, Bonds, Debentures, Futures, Options, Mutual Fund Units
- *Intermediaries* - Brokers, Sub brokers, Custodians, Share transfer agents, Merchant Bankers
- *Issuers of securities* - Companies, Bodies corporate, Government, Financial Institutions, Mutual funds, Banks
- *Investors* - Individuals, Companies, Mutual funds, Financial Institutions, Foreign Institutional Investors
- *Market Regulators* - SEBI, RBI (to some extent), Department of Company Affairs Enforcement of Securities Regulation

The SEBI has powers to carry out routine inspections of market intermediaries to ensure compliance with prescribed standards. It also has investigation powers similar to that of a civil court in terms of summoning persons and obtaining information relevant to its enquiry. Action is taken on the basis of investigation. The enforcement powers of SEBI include issuance of directions, imposition of monetary penalties, cancellation of registration and even prosecution of market intermediaries. To ensure effective and credible use of enforcement powers, the SEBI has adopted measures such as development of a stock watch system, uniform price bands and establishment of a Market Surveillance Division.

While SEBI has powers of direct surveillance of the stock exchanges, members of stock exchanges and other market intermediaries registered with it, SEBI has no powers over listed companies. Further, the present penalty levels in many cases are not high enough to effectively deter market players from regulatory violations. In particular, the amount of monetary penalty for non-compliance with respect to disclosure, information requirements, insider trading and market manipulation is very inadequate.

Example: A maximum monetary penalty of only ₹ 1,000 can be imposed in case of failure to comply with the provisions of listing agreement. Similarly, under the SEBI Act the penalty for insider trading and non-disclosure of acquisition of shares and takeovers is only ₹ 5 lakh. The Group believes that there is a need to allow SEBI enhanced authority and powers to impose penalty commensurate with the gravity of the violation (i.e., disgorgement powers).

An additional problem relates to delays in taking action against those who commit frauds. A number of companies, which had collected funds in the past through public issues, cannot even be traced. To take action against such companies and bring their Directors to book, a number of initiatives have been taken including the establishment of Central Coordination and Monitoring Committee (CCMC), with Secretary, DCA and Chairman, SEBI as its co-chairmen. However, only limited success has been achieved. Clearly, the enforcement procedures are cumbersome, time-consuming and involve too many agencies. There is a need to streamline the procedures to quickly detect frauds and take appropriate remedial measures.

In addition to the problem stated above, the slow response in case of frauds results from long delays arising from the obligation to follow due process.

Caution As a regulatory body has to be accountable for its action, by implication, it gives the alleged institution an opportunity to show why action should not be taken.

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There is a need to streamline the procedures relating to due process. Also, dealing with cases of suspected fraud often requires freezing the situation, while the legal process is being pursued. This happens in India, but the decision to freeze the situation often takes time.

14.2.2 Cooperation in Regulation

Various segments of the domestic financial market are getting increasingly integrated. There have also been progressive linkages between the domestic and international capital markets. As a result, the regulatory interventions or their absence in one market tend to have repercussions in other markets that are more serious and more widespread than in the past. Further, with the emergence of more and more financial supermarkets and growing complexity of financial transactions, there are increasing instances of the same market intermediary coming under the purview of multiple regulatory bodies. These factors have raised the potential for regulatory gaps as well as overlaps, thereby underlining the need for greater cooperation among various regulators.

Notes Currently, coordination among domestic regulators is occurring through the High Level Group on Capital Markets (HLGCM) comprising the RBI, SEBI, the IRDA and Finance Ministry.

The HLGCM has set up two Standing Committees: one for regulatory coordination and the other for coordination in matters relating to the development of debt markets. The Committee meets periodically to exchange information and views. Besides, to address specific issues such as DvP system or asset securitisation, the RBI and SEBI have been coordinating through the institution of working groups. The Group observes that there is scope to further strengthen the coordination efforts. There may be merit in formalising the HLGCM by giving it a legal status. Besides, the HLGCM needs to meet more frequently and its functioning needs to be made more transparent. Also, a system needs to be devised to allow designated functionaries (not necessarily only at the top level) to share specified market information on a routine and automatic basis.

As regards coordination with regulators in other countries, the RBI has put in place a system of exchange of need-based information in respect of international operations. However, the powers of SEBI to assist foreign regulators or to enter into MOUs or other cooperation arrangements are not explicitly provided by legislation, although SEBI has signed a MoU with the Securities Exchange Commission of the USA. Hence, the Group is of view that necessary legislative changes need to be made to enhance SEBI's scope in this regard.

Task Write down the market integration and efficiency of Indian stock markets.

14.2.3 Self-Regulation

The SEBI Act provides for promotion and regulation of SROs (i.e., stock exchanges). The stock exchanges are empowered to make rules and regulations for their members and for regulating the conduct of respective members. However, self-regulation is not always effective, because the current ownership and governance structures of many stock exchanges allow scope for conflict of interest. These exchanges are owned and managed by members who enjoy exclusive trading rights. In the broker-owned exchanges, brokers elect their representatives to regulate activities of the exchange, including those of the brokers themselves. This raises fairness issues,

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because the members of stock exchange governing boards have access to valuable information about market participants. Elimination of such conflict of interest through demutualisation, which implies separation of ownership of exchange from the right to trade on it, can promote fairness and reinforce investor protection.

Further, the slow evolution of the Association of Mutual Funds of India (AMFI) as a SRO has meant continuation of substantial regulatory burden on SEBI. In this regard, the Group suggests that SEBI assist the AMFI to develop into a full-fledged SRO. Similarly, in money and government securities markets, Fixed Income Money Market and Derivatives Association of India (FIMMDA) and Primary Dealers Association of India (PDAI) are operating as industry level associations, who are gradually taking on the role of SROs. There is as yet no regulatory oversight of the RBI over these emerging SROs. However, to facilitate these associations to emerge as full-fledged SROs, the RBI is engaging them in a consultative process, which needs to be further intensified. On their part, to promote integrity of the markets, FIMMDA and PDAI need to establish a comprehensive code of conduct and best practices in securities transactions and also have a mechanism to enforce such codes. The RBI can play a supportive role here.

Caselet

Structure and Trends of the Indian Securities Markets in 2010-2011

The securities market has essentially three categories of participants—the issuer of the securities, the investors in the securities, and the intermediaries. The issuers are the borrowers or deficit savers, who issue securities to raise funds. The investors, who are surplus savers, deploy their savings by subscribing to these securities. The intermediaries are the agents who match the needs of the users and the suppliers of funds for a commission. These intermediaries function to help both the issuers and the investors to achieve their respective goals. There are a large variety and number of intermediaries providing various services in the Indian securities market (Table 1). This process of mobilising the resources is carried out under the supervision and overview of the regulators. The regulators develop fair market practices and regulate the conduct of the issuers of securities and the intermediaries. They are also in charge of protecting the interests of the investors. The regulator ensures a high service standard from the intermediaries, as well as the supply of quality securities and non-manipulated demand for them in the market.

Table 1: Market Participants in the Indian Securities Market

Market Participants	FY 2010	FY 2011	As on Sep 30, 2011
Securities Appellate Tribunal (SAT)	1	1	1
Regulators*	4	4	4
Depositories	2	2	2
Stock Exchanges			
With Equities Trading	19	19	19
With Debt Market Segment	2	2	2
With Derivative Trading	2	2	2
With Currency Derivatives	4	4	4
Brokers (Cash Segment)**	9,772	10,203	10,248
Corporate Brokers (Cash Segment)	4,197	4,774	4,833

Contd....

Notes

Brokers (Equity Derivatives)	1,705	2,111	2,240
Brokers (Currency Derivatives)	1,459	2,008	2,083
Sub-brokers	75,378	83,808	79,797
FIIs	1,713	1,722	1,745
Portfolio Managers	242	267	248
Custodians	17	17	19
Registrars to an issue & share Transfer Agents	74	73	73
Primary Dealers	20	21	21
Merchant Bankers	164	192	192
Bankers to an Issue	48	55	56
Debenture Trustees	30	29	30
Underwriters	5	3	3
Venture Capital Funds	158	184	197
Foregin Venture Capital Investors	143	153	164
Mutual Funds	47	51	51
Collective Investment Schemes	1	1	1

* DCA, DEA, RBI, and SEBI

**Including brokers on Mangalore SE (58), HSE (303), Magadh SE (197), and SKSE (410)

Source: http://www.nseindia.com/content/us/ismr_full2011.pdf

Notes As on October 31, 2011, there are eight standalone PDs and 13 banks authorised to undertake PD business departmentally

Self Assessment

State whether the following statements are true or false:

6. Stability is concerned with safeguarding the value of liabilities of financial intermediaries that serve as stores of wealth.
7. The regulatory responsibility of the securities market is vested in the SEBI, the RBI, and two government departments—Department of Company Affairs and Department of Economic Affairs.
8. The RBI has powers to carry out routine inspections of market intermediaries to ensure compliance with prescribed standards.
9. The slow evolution of the Association of Mutual Funds of India (AMFI) as a SRO has meant continuation of substantial regulatory burden on SEBI.
10. There is also a system of independent judicial review of the decisions of SEBI only.

14.3 Securities and Exchange Board of India Act, 1992

The Government has framed rules under the SCRA, the SEBI Act, and the Depositories Act. SEBI has framed regulations under the SEBI Act and the Depositories Act for the registration and

regulation of all market intermediaries, and for the prevention of unfair trade practices, insider trading, etc. Under these Acts, the Government and SEBI issue notifications, guidelines, and circulars that the market participants need to comply with. The SROs, like the stock exchanges, have also laid down their own rules and regulations.

Major part of the liberalisation process was the repeal of the Capital Issues (Control) Act, 1947, in May 1992. With this, Government's control over issues of capital, pricing of the issues, fixing of premium and rates of interest on debentures etc. ceased, and the office which administered the Act was abolished: the market was allowed to allocate resources to competing uses. However, to ensure effective regulation of the market, SEBI Act, 1992 was enacted to establish SEBI with statutory powers for:

(a) Protecting the interests of investors in securities,

(b) Promoting the development of the securities market, and

(c) Regulating the securities market.

Its regulatory jurisdiction extends over companies listed on Stock Exchanges and companies intending to get their securities listed on any recognised stock exchange in the issuance of securities and transfer of securities, in addition to all intermediaries and persons associated with securities market. SEBI can specify the matters to be disclosed and the standards of disclosure required for the protection of investors in respect of issues; can issue directions to all intermediaries and other persons associated with the securities market in the interest of investors or of orderly development of the securities market; and can conduct enquiries, audits and inspection of all concerned and adjudicate offences under the Act. In short, it has been given necessary autonomy and authority to regulate and develop an orderly securities market.

Notes All the intermediaries and persons associated with securities market, viz., brokers and sub-brokers, underwriters, merchant bankers, bankers to the issue, share transfer agents and registrars to the issue, depositories, depository participants, portfolio managers, debentures trustees, foreign institutional investors, custodians, venture capital funds, mutual funds, collective investments schemes, credit rating agencies, etc., shall be registered with SEBI and shall be governed by the SEBI Regulations pertaining to respective market intermediary.

14.3.1 Constitution of Securities and Exchange Board of India (SEBI)

The Central Government has constituted a Board by the name of SEBI under Section 3 of SEBI Act. The head office of SEBI is in Mumbai. SEBI may establish offices at other places in India.

SEBI consists of the following members, namely:

(a) A Chairman;

(b) Two members from amongst the officials of the Ministries of the Central Government dealing with Finance and administration of Companies Act, 1956;

(c) One member from amongst the officials of the Reserve Bank of India;

(d) Five other members of whom at least three shall be whole time members to be appointed by the Central Government.

The general superintendence, direction and management of the affairs of SEBI vests in a Board of Members which exercises all powers and do all acts and things which may be exercised or done by SEBI.

Notes

The Chairman and the other members are from amongst the persons of ability, integrity and standing who have shown capacity in dealing with problems relating to securities market or have special knowledge or experience of law, finance, economics, accountancy, administration or in any other discipline which, in the opinion of the Central Government, shall be useful to SEBI.

14.3.2 Functions of SEBI

SEBI has been obligated to protect the interests of the investors in securities and to promote and development of, and to regulate the securities market by such measures as it thinks fit. The measures referred to therein may provide for:

(a) Regulating the business in stock exchanges and any other securities markets;

(b) Registering and regulating the working of stock brokers, sub-brokers, share transfer agents, bankers to an issue, trustees of trust deeds, registrars to an issue, merchant bankers, underwriters, portfolio managers, investment advisers and such other intermediaries who may be associated with securities markets in any manner;

(c) Registering and regulating the working of the depositories, participants, custodians of securities, foreign institutional investors, credit rating agencies and such other intermediaries as SEBI may, by notification, specify in this behalf;

(d) Registering and regulating the working of venture capital funds and collective investment schemes including mutual funds;

(e) Promoting and regulating self-regulatory organisations;

(f) Prohibiting fraudulent and unfair trade practices relating to securities markets;

(g) Promoting investors' education and training of intermediaries of securities markets;

(h) Prohibiting insider trading in securities;

(i) Regulating substantial acquisition of shares and take-over of companies;

(j) Calling for information from, undertaking inspection, conducting inquiries and audits of the stock exchanges, mutual funds, other persons associated with the securities market, intermediaries and self- regulatory organisations in the securities market;

(k) Calling for information and record from any bank or any other authority or board or corporation established or constituted by or under any Central, State or Provincial Act in respect of any transaction in securities which is under investigation or inquiry by the Board;

(l) Performing such functions and exercising according to Securities Contracts (Regulation) Act, 1956, as may be delegated to it by the Central Government;

(m) Levying fees or other charges for carrying out the purpose of this section;

(n) Conducting research for the above purposes;

(o) Calling from or furnishing to any such agencies, as may be specified by SEBI, such information as may be considered necessary by it for the efficient discharge of its functions;

(p) Performing such other functions as may be prescribed.

SEBI may, for the protection of investors,

(a) Specify, by regulations,

    (i) The matters relating to issue of capital, transfer of securities and other matters incidental thereto; and

Notes

(ii) The manner in which such matters, shall be disclosed by the companies; and

(b) By general or special orders,

(i) Prohibit any company from issuing of prospectus, any offer document, or advertisement soliciting money from the public for the issue of securities,

(ii) Specify the conditions subject to which the prospectus, such offer document or advertisement, if not prohibited may be issued. (Section 11A).

SEBI may issue directions to any person or class of persons referred to in section 12, or associated with the securities market or to any company in respect of matters specified in section 11A. if it is in the interest of investors, or orderly development of securities market to prevent the affairs of any intermediary or other persons referred to in section 12 being conducted in a manner detrimental to the interests of investors or securities market to secure the proper management of any such intermediary or person (Section 11B).

Did u know? SEBI regulates the business in stock exchanges and any other securities markets and the working of collective investment schemes, including mutual funds, registered by it. SEBI promotes investor's education and training of intermediaries of securities market. It prohibits fraudulent and unfair trade practices relating to securities markets, and insider trading in securities, with the imposition of monetary penalties, on erring market intermediaries, It also regulates substantial acquisition of shares and takeover of companies and can call for information from, carry out inspection, conduct inquiries and audits of the stock exchanges and intermediaries and self regulatory organisations in the securities market.

Self Assessment

Fill in the blanks:

11. SEBI has framed regulations under the SEBI Act and the ……. for the registration and regulation of all market intermediaries.
12. The……., like the stock exchanges, have also laid down their own rules and regulations.
13. The Central Government has constituted a Board by the name of SEBI under Section 3 of …….
14. SEBI has been obligated to protect the interests of the ……. in securities.
15. SEBI specify the matters relating to issue of capital, ……. and other matters incidental thereto.

Case Study

Market Failure in Ethiopian Coffee Market

The coffee market of Ethiopia, when analysed by the government suggested that the existing mechanism of the coffee auction system is increasingly becoming a market failure. Coffee was traded through a government-run auction system. The auction was carried out in the supervision of the Ministry of Agriculture. However, the process of sale was that the sellers would bring their produce to the central market in the capital City

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of Addis Ababa, where the auction would be held. The coffee would be grown in different locations in the country and traded in a central market. When the coffee would arrive, the truck carrying coffee would be identified and tagged by the local authority in the producing areas. The truck would be sealed and a voucher representing the details would be issued. The trucks would be mandated to take the coffee only to the auction centre. At the auction centre, the grading unit would draw the samples and grade would be assigned. The coffee would not be offloaded and would remain on the truck. This means that the owner of the coffee has to pay the rent for the truck as long as it remains parked in the compound of the auction centre.

After the grade was assigned, the sample would be made available to the buyer to inspect. The auction would be carried out in a room called as auction centre, where the samples would be displayed. The buyers would bid for each lot and the highest bidder would win the bid.

However, the system was not so simple. The buyers were few and suspected to have cartels. These buyers would meet and fix up the maximum price to be offered to the sellers. Also an unsaid understanding would exist where, a specific seller would be offered price by a specific buyer only. It was like saying "I don't bid for your supplier and you don't bid for mine". Also, as this was a two-way arrangement, the sellers also would like to have a secretive understanding with buyers for supplies and prices.

During the bidding, the buyers would offer a price and accepted by the seller. This would be noted by the auction authority and the buyer would be asked to deposit the cheque against the proposed purchase. Now the seller would have the responsibility to deliver the coffee at the buyers' warehouse. When this happened, the seller would be paid after he produced the delivery completion document.

The major dispute and exploitation of the seller used to happen here. The buyer would disagree upon the quality or quantity and did not accept the delivery. The seller, faced with a difficult choice to make, would accept discount to be adjusted in cash, and deliver the coffee. Sellers would always be price takers.

The market failure evident in this case is mainly the monopoly; where the bunch of buyers would dominate the market and not allow the sellers on equal footing. Second was the information asymmetry. The buyers could afford to subscribe to news resources like Reuters and keep updated information about the international prices. But the sellers would not know it.

Government intervention in this case was called for and the government intervened by revamping the legal framework. All coffee produced in Ethiopia was mandated to be traded only at the recently established commodity exchange. The Ethiopia Commodity Exchange or the ECX, through the law passed for coffee trading in Ethiopia, became the single designated market place for coffee. The enactment was received with lot of opposition, but the strong will of the government to enforce the same made it effective.

The mandatory trade of coffee through the ECX ensured that the buyers and the seller were on equal footing. The exchange's system ensured that the delivery point is the exchange warehouse and the guarantee for the quality of the goods is advanced by the exchange. This also was supported by the policy of the exchange to execute the trades based of warehoused goods, which could be sold within 30 days against the on truck sale earlier. The concept on non-identity preserved warehouse management system meant that the deposits lost the identity and the malpractice of secretive agreements between buyer and sellers were broken. Further, information dissemination by the exchange ensured that the market failures are removed.

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However this intervention was not without cost. The country had to pay a price in terms of loss of the export earnings and domestic dissatisfaction amongst exporters. Still, the total value of trade was in excess of 500 million USD.

Question:

Analyse the case and list down the reasons behind market failure in Ethiopian coffee market.

Source: Kulkarni B. (2011). "Commodity Markets & Derivatives". Excel Books.

14.4 Summary

- The Securities and Exchange Board of India (SEBI) is the regulator charged with the orderly functioning of the securities market in India, protect the interests of investors and ensure development of the securities market.
- The securities markets in India have witnessed several policy initiatives, which have refined the market micro-structure, modernised operations and broadened investment choices for the investors.
- The securities market has two interdependent and inseparable segments, the new issues (primary market) and the stock (secondary) market.
- The primary market provides the channel for sale of new securities. Secondary market refers to a market where securities are traded after being initially offered to the public in the primary market and/or listed on the Stock Exchange.
- Efficiency of the financial system is governed by the role of markets in mobilising and allocating financial resources, in providing liquidity and payment services and in gathering information on which to base investment decisions.
- Various segments of the domestic financial market are getting increasingly integrated. There have also been progressive linkages between the domestic and international capital markets.
- The SEBI Act provides for promotion and regulation of SROs (i.e., stock exchanges).
- The stock exchanges are empowered to make rules and regulations for their members and for regulating the conduct of respective members.
- SEBI has framed regulations under the SEBI Act and the Depositories Act for the registration and regulation of all market intermediaries, and for the prevention of unfair trade practices, insider trading, etc.
- The Central Government has constituted a Board by the name of SEBI under Section 3 of SEBI Act. The head office of SEBI is in Mumbai. SEBI may establish offices at other places in India.

14.5 Keywords

Fixed Income Money Market and Derivatives Association of India (FIMMDA): It is an Association of Commercial Banks, Financial Institutions and Primary Dealers. FIMMDA is a voluntary market body for the bond, Money and Derivatives Markets.

Market capitalisation: Market capitalisation (or market cap) is the total value of the issued shares of a publicly traded company; it is equal to the share price times the number of shares outstanding.

Notes

National Stock Exchange (NSE): The National Stock Exchange (NSE) is stock exchange located at Mumbai, India. It is the 11th largest stock exchanges in the world by market capitalisation and largest in India by daily turnover and number of trades, for both equities and derivative trading.

OTC market, over-the-counter market: A stock exchange where securities transactions are made via telephone and computer rather than on the floor of an exchange.

Primary Market: The primary market provides the channel for sale of new securities.

SEBI: The Securities and Exchange Board of India (SEBI) is the regulator for the securities market in India. It was established on 12 April 1992 through the SEBI Act, 1992.

Secondary Market: Secondary market refers to a market where securities are traded after being initially offered to the public in the primary market and/or listed on the Stock Exchange.

Securities Markets: Securities market is an economic institute within which take place sale and purchase transactions of securities between subjects of economy on the base of demand and supply.

14.6 Review Questions

1. Briefly explain the securities markets in India.
2. What is primary market and secondary market?
3. Describe the securities market regulation in India.
4. "Self-regulation is not always effective". Elucidate.
5. What are the components of security market?
6. What are the two standing committees of HLGCM?
7. Discuss about Securities and Exchange Board of India Act, 1992.
8. What are the functions of SEBI?
9. "The number of instruments available in derivatives has increased." Provide data.

Answers: Self Assessment

1.	24	2.	Security market
3.	Investors in securities	4.	Asian stock market
5.	Stock (secondary)	6.	True
7.	True	8.	False
9.	True	10.	False
11.	Depositories Act	12.	SROs
13.	SEBI Act	14.	Investors
15.	Transfer of securities		

14.7 Further Readings

Notes

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