

**Securitisation:** Taking fixed, long term loans and turning them into paper that can readily be bought and sold in the bond market. The process by which corporations can repackage and sell certain assets as securities.

**Deregulation:** Significant liberalization of domestic banking and capital markets regulation, opening up hitherto closed markets to an increasing range of borrowers and offering an expanding variety of instruments.

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### 18.11 SELF-ASSESSMENT QUESTIONS

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1. Define "globalisation". What are the causes of globalisation in the financial services industry?
2. Discuss the consequences of globalisation in the financial services industry.
3. What are the causes and consequences of 'the M & A activity in the financial services industry?
4. Write short notes on :
  - a) Disintermediation
  - b) Deregulation
  - c) Institutionalisation
  - d) Securitisation

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### 18.12 FURTHER READINGS

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1. Roy C. Smith and Ingo Walter, 1997, *Global Bankers*, Oxford University Press, New York.
2. Robert Soloman, 1999, *Money on the Move; The Revolution in International Finance since 1980*, Princeton University Press, New Jersey.
3. George Crawford and Bidyut Sen, 1996, *Derivatives and Decision Makers: Understanding and Managing Risk*, John Wiley & Sons Ltd.
4. Joel Kurtzman, 1993, *Death of Money: How the Electronic Economy has destabilised the World's Markets and Created Financial Chaos*, Simon & Schuster, New York.
5. Elinor Harris Soloman, 1997, *Virtual Money: Understanding the Power and Risks of Money's high-speed Journey into Electronic Space*, Oxford University Press, New York.

# UNIT 19 FINANCIAL INNOVATIONS IN INTERNATIONAL BANKING

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## Objectives

After reading this unit, you should be able to:

- understand the causes and consequences of Financial Innovation
  - identify various products of **Financial** Innovation and Engineering
- describe the Indian scenario with regard to these financial products.

## Structure

- 19.1 Introduction
- 19.2 Forces Stimulating Financial Innovation
- 19.3 Financial Engineering
- 19.4 Risk Management Products: Derivatives
- 19.5 Forward **Contracts**
- 19.6 Financial Futures
- 19.7 Options
- 19.8 Forwards, Futures and Option Products
- 19.9 Forward Rate Agreement (FRA)
- 19.10 Interest Rate Caps, Floors and Collars
- 19.11 Currency and Interest Rate Swaps
- 19.12 Options on Swaps
- 19.13 Benefits of Derivatives to End-Users
- 19.14 Risks Associated with Derivatives
- 19.15 Corporate Policy on Hedging
- 19.16 Derivatives Documentation
- 19.17 **Indian** Scenario
- 19.18 Summary
- 19.19 Key Words
- 19.20 Self-Assessment Questions
- 19.21 Further Readings

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## 19. INTRODUCTION

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Innovation has become the **industrial** religion of the late 20th century. Business **sees** it as the key to increasing profits and market share. Innovation is **usually thought of as** the creation of a better 'product' or '**process**'. But it could, just **as** easily, be the substitution of a cheaper **material** in an existing product, or a better way of **marketing, distributing** or **supporting** a product or service. According to **Herbert** Shepherd's definition "**Innovation occurs** when an entity learns to do something it did not know how to do before and then **proceeds** to do it in a sustained way or not to do something that it **formerly** did and proceeds not to do it in a sustained manner".

**Recent** years have witnessed a **sharp** acceleration in the pace of innovation, deregulation and structural changes, transforming the international financial system in important ways. Major new financial instruments - mostly taking the **form** of off balance-sheet

commitments - have either been created or have dramatically increased their role in **the** financial structure. International credit flows have shifted away **from** loans through large **international** banks to direct **credit** markets, the volume of daily transactions have multiplied, financial markets have become far more closely integrated worldwide, and the capital has become much more mobile.

In many respects, **innovation** has improved the efficiency of international financial markets, mainly by offering a broader and more flexible range of instruments both for borrowing and for hedging interest and exchange rate exposures. These, changes have clearly aided banks and their customers to cope with the stresses associated with **the** greater volatility of exchange and interest rates in recent years.

## **19.2. FORCES STIMULATING FINANCIAL INNOVATION**

The stimulus behind financial innovation arose from the confluence of a series of **disparate** trends during the 1970s and 1980s. Macro-economic trends have helped to foster **structural** change and innovation. Most important are the sharp rise in inflation and the increased volatility of interest rates and exchange rates. Higher volatility has generated an increase in the risk exposure of those financial intermediaries which fail to **maintain** a strict match in the term structure of their assets and liabilities. There has been a **need on** the part of both financial intermediaries and **non-financial** institutions to develop effective **hedging** devices and strategies to deal with the increased risks related to volatility, and there has been an incentive to develop new financial instruments which can be used to **transform** and shift the burden of risk. We have seen a proliferation of new **financial instruments** and techniques, with the capability of meeting these needs.

Another important trend has been the changing regulatory environment affecting national financial markets, There have been two aspects to this.

One has been the growing worldwide tendency to deregulate and to reduce **structural** rigidities and barriers to competition in domestic financial markets. The moves toward deregulation have varied substantially **from** country to **country** and include such measures as the abolition of exchange controls, the phasing-out of interest rate ceilings on deposit and lending activities of key financial intermediaries, the opening of domestic **markets** to foreign financial institutions, tax reductions and the relaxation of certain **traditional** boundaries limiting the types of financial activity in which particular financial institutions may engage.

The other aspect of the regulatory **environment** fostering innovation has been the increased attention which supervisory authorities have begun to pay to the adequacy of financial institutions' capital ratios, particularly as the quality of some international and domestic assets have come into question. The effect has been to create an incentive for banks to increase their activity in business subject to less stringent capital requirements - a powerful motivation to shift to off-balance-sheet products.

Another trend which has spurred innovation and structural change is the recent widespread application of new communications and computer **technology** to **financial** , markets and financial transactions. This encompasses the expansion of worldwide . information and new service companies and improvements in accounting and information processing systems in financial institutions. Similarly the application of **advanced** computer technology to the international payment systems and to transactions processing, generally, has **acted as** a stimulus to innovations and structural change. The lowering of transactions costs to a fraction of earlier levels has **given a** powerful impetus to innovation. The availability of large low-cost computing capacity was vital as pricing some products involves complex number crunching. But theoretical advances were equally important, including the development of the capital asset pricing **model** (based on the idea that diversification reduces risk) and the academic option pricing theory of the 1960s **and** 1970s which met the volatile markets of the deregulating 1980s and brought a new rigor , to an activity which had previously relied on rules of thumb. The burst of innovation **has** made it possible to put an accurate price on **financial** contracts that specify even more precisely the **circumstances** in which they **will/will** not pay off and how much they will pay, enabling users to fine tune the risks to which they are exposed.

Finally **growing** competition in international **financial markets** is a factor increasing the

pressure for innovation and structural change. Technological change appears to foster a rise in competition as the developers of new technology seek to exploit its advantages in as many markets as possible. Moreover, the shifting patterns of savings and investment may put pressure on financial institutions whose markets are **shrinking** to innovate and to compete more aggressively for a larger share of their traditional market and to expand **into** new areas of business and for institutions resident in geographical areas with excess liquidity to seek new ways of deploying it.

The interaction of these forces has led to an explosion in the demand for innovative financial instruments that is to the **desire** of economic agents for new vehicles that perform the functions of transferring risk, enhancing liquidity, and generating debt and equity that help to meet the requirements of the changing financial landscape. These forces have also fostered very rapid growth of the supply of new instruments supply in the sense of increased willingness and ability of financial institutions to provide and to **make** markets in these new instruments.

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### 19.3 FINANCIAL ENGINEERING

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All factors, especially the above, the need for hedging against financial risks has fuelled the demand for financial engineering, the creation of **instruments** to limit the financial risks. The financial engineers work mainly for the big banks in teams grafted on to their treasuries. As the **market** for these services develops the customers are becoming more choosy. Many want the best of both worlds, to shelter their profits against storms but still have a chance to profit from winds blowing in a favourable direction. To meet this demand, banks invent risk packages tailored to each customer's **needs**. Then as a rule the banks themselves take on the risks, their customers want to shed, for a fee.

One of the most important innovations in risk management has been the development of specialized teams with the time, skills and computer power to analyse clients' problems. Banks have little choice, either they offer a comprehensive risk management service or their large corporate and institutional clients will buy it from the competitor. And if they ignore the **clamour** for protection they will also miss a golden opportunity. Although most banks offer advice free, the products do not always come cheap; straight option products for example can command a premium of 3% or 4% up-front. It is not just the money. The banks get a chance of repeat business from larger international companies and investors, with the possibility of spin-off transactions too. Risk management is a necessary extension of a bank's other corporate finance activities.

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### 19.4 RISK MANAGEMENT PRODUCTS: DERIVATIVES

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"Derivatives" has become a buzzword of today. What are derivatives? Derivatives are contracts whose value is derived from the **value** of some underlying asset, such as currencies, equities or commodities, from an indicator like interest rates or from a stock market or other index. The derivative instruments are variously as called forwards, futures, options, swaps, caps, floors, collars, captions, swaptions, floortions, **spreadations**, range-forwards, breakforwards, cylinders, look-backs, butterflies and condors.

Derivatives are called so because the values of forwards, futures, options and swaps are derived from some other instrument. The other instruments are called underlying. An underlying is the asset price reference rate, or index level from which a derivatives transaction inherits its principal source of value. In practice, **derivatives** cover a diverse **spectrum** of underlying, including physical assets, exchange rates, **commodity prices**, equity prices or indexes. Practically nothing limits the asset's reference rates or indexes that can serve as the underlying for a **derivatives** contract. Some derivatives can cover more than one underlying. In short derivatives are abstractions that depend on reference to something else. However, when we discuss derivatives, it does not require a great leap in abstraction. The whole field of finance is based on abstraction and almost **all** of the financial theory and analysis is **organised** around an abstraction called the future; it takes **the** form of future cash flows, rates for discounting future values, risk and so forth.

Derivatives are bilateral contracts. They represent obligations by one **party** to the other **party** in the contract and vice versa. The value of a bilateral contract thus depends not only

on the value of its **underlying** but also the performance of **the** two parties to the contract. All derivatives are either constructed with or are one of the **two** simple and **fundamental** financial building blocks: forwards and options. A forward obligates one **counterparty** to buy and the other to sell an asset or commodities in the **future** for an agreed **price**. An **option contract** gives the buyer (or the holder of the option) **the** right but not the obligation, to buy or sell an asset in the future at an agreed upon **premium price**. On these **building blocks** are defined, the cash flows on virtually any derivative **transaction** can be viewed as the net cash flow on a portfolio comprised of some combination of these building blocks.

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## 19.5 FORWARD CONTRACTS

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The oldest, **the** simplest and the least subtle derivative instruments allowing **companies** to reduce uncertainty about future income is the forward exchange contract. Forward contract is a binding contract to purchase or sell a **foreign** currency at an **exchange** rate determined on the date that the contract is made but with payment and delivery at a specified future date.

### *Benefits*

- i) An institution can use the forward market to hedge or lock in the price of **its** **commitment** to purchase or sell a currency in the **future**.
- ii) There is generally no initial margin or variation margin to be paid nor is there an option premium.

### *Risks*

- i) They do not enable the investor to derive any gain from favourable movements or to unwind the transactions once the contract has been made.
- ii) By entering into a forward contract risk of exposure is **created** if the future **commitments** under the contract cannot be **met**. It is an "unforgiving **instrument**".
- iii) The movement in price in the currency between the date **the contract was** made and the date of delivery may be favourable in which case profit will be forgone and thereby resulting in an opportunity loss.

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## 19.6 FINANCIAL FUTURES

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A futures contract like a forward contract is an agreement between two **parties** to **buy** or **sell** an asset at a certain time in the future for a certain price. However, unlike forward contracts futures contracts are normally traded on an exchange. To make trading **possible** the exchange specifies certain **standardised** features of the contract. **As** the two parties to the contract do not necessarily know each other the exchange also provides a **mechanism** which gives the two parties a guarantee that the contract will be honoured. A futures contract is different from a forward contract in that an exact delivery date is not usually specified. The contract is referred to by its delivery month and the exchange specifies the precise period during the month when delivery must be made. Futures contracts differ from forward contracts in that there is marking to market or daily settlement. The **broker** will require the investor to deposit funds in what is **termed** a margin account to **guarantee** the investor's performance. **The** amount that must be deposited at the time the contract is first entered into is known as initial **margin**. To ensure that the **balance** in the margin account never becomes negative, a maintenance or **variation** margin is set.

### *Characteristics*

- Futures contracts exist for a limited number of financial **instruments**.
- The specifications for a contract are set by the futures exchange.
- A futures contract is for a standard amount of the financial instrument.
- Every **futures** contract has a **standardised** delivery/settlement date.

- The price at which a contract is bought and sold is agreed between dealers on the futures exchange.
- A rise in the market price of a futures contract after purchase represents a gain for a buyer and a loss for a seller of the contract. Similarly a fall in price represents a loss to the buyer and a gain to the seller.
- The futures markets are very liquid for certain contracts at certain *times*.
- All futures contracts are registered with the futures exchange. The exchange becomes a counterparty to each side of the transaction with the buyer and the seller. Futures markets are highly **organised** and self-regulated.
- The buyer and the seller of a **futures** contract must each pay an initial cash deposit (initial margin). There might also be further payments called **variation** margins, depending **on** subsequent price movements
- A buyer takes a long position in the futures contract and a seller takes a "**short**" position. For every "short" position in the **market** there is a long position. The majority of future positions are closed out or reversed before their delivery **date**, with an opposite sale or purchase.
- A futures contract has a limited and short life (usually not exceeding 18 months although quotations **upto** two years and ahead are not unknown).
- Futures contracts are highly leveraged (one can usually trade on a margin of 10% of the value of the contract).
- Futures market operates on a "no-debt basis". All contracts are "marked to market" daily.
- It is a pricing market (a price fixing mechanism) not one for delivery, "cash" market is usually utilised for actual delivery. Delivery is rare in Financial Futures (as **low as** 0.5% of certain contracts traded).
- Clearing House performs a most important function in smooth operation of Futures Market. It stands as the counterparty to every **trade**. It removes the **risk** associated with the other party to the transaction.

#### Advantages

- i) Standardisation of quantity **and** specificity of instruments facilitate transferability of futures contracts, which **unlike** forward contracts, are readily negotiable within the **forum** of the exchange.
- ii) It **provides** a convenient hedging medium.
- iii) It allows price discovery or the expression of present expectations of the shape of the yield curve for a much wider class of users than those with access to the traditional cash-based money market.

#### Risks

- i) As with forwards, the use of futures contracts may create an exposure if the commitment does not **materialise**.
- ii) Any potential profit from favourable price movement before maturity will be forgone.
- iii) **Variation** margin may be called at the end of any trading day depending on movements in **the** market price of the future. As well as **a-cash** flow disadvantage the administrative burden of monitoring futures positions on a daily basis may **make** them uneconomic.
- iv) Contracts **are** traded only for **certain** currencies.
- v) Contracts are in standard denominations and it may not be possible to match exactly a future commitment.

## 19.7 OPTIONS

Unlike forward contracts and financial futures options give the buyer the opportunity but not the obligation to buy or sell a financial instrument at a pre-agreed price in the future. As the name suggests, an option contract allows the buyer who purchases it the option right either to trade at the rate or price stated in the contract if this is to the option buyer's advantage or let the option expire if that would be better. That is, options have "throwaway feature".

### Characteristics

#### a) Rights and Obligations

- An option is, for its owner, the right (but not the obligation) to buy or sell at a specific price at a certain future date and time.
- The buyer of the option pays a premium to the seller.
- The seller (or writer) has the obligation to buy or sell the asset if the owner of the option exercise it.
- Buyers and sellers have asymmetric payout profiles.

#### b) Puts and Calls

- An FX option is the right to exchange two currencies and is therefore the right to buy and the right to sell at the same time.
- A call is the right to buy an asset, at a specified price and time.
- A put is the right to sell an asset at a specified price and time.

### Exercise Price

- The price at which the option can be exercised is known as the strike or exercise price.

### European/American

- A European option can be exercised only at expiry.
- An American option can be exercised at any time before or at expiry.
- Expiration Date and Time is generally 3.00 p.m. Tokyo time on the date the option matures.
- Delivery Date is the date the FX cash position created by an option exercise is delivered (normally spot after expiry).

### At the Money/In the Money/Out of the Money

- If the strike price and the market price of an option are the same it is "at the money".
- A call option is "in the money" when its exercise price is less than the price of the underlying security. A put option is in the money when its exercise price is greater than the price of the underlying security.

A call option is "out of the money" if its exercise price is greater than the price of the underlying security. A put option is "out of money" when its exercise price is less than the price of the underlying security. To give an example:

- A European style 3 month USD call/JPY put with strike 105.00, gives the purchaser the right in three months, to buy US Dollars for 105.00 Yen per US Dollar,
- If the spot exchange rate at expiry is higher than 105.00, the option is "in the money", and the purchaser should exercise.
- If the spot exchange rate at expiry is lower than 105.00 i.e. the option is "out of the money", then the purchaser should not exercise.

### Pricing of Options

The overall price of an option is the sum of its intrinsic value and its time value.

**Intrinsic value:** The intrinsic value of an option is the benefit to the holder if he were to exercise the option immediately. In case of the money option, the intrinsic value of the option is the difference between the market value of the underlying asset and the strike price of the option. The intrinsic value of an option can never be less than nil, as there is no downside risk to the investor beyond the value of the premium.

**Time Value:** The time value is the difference between the market value of the option and its intrinsic value. The factors which affect the time value of an option are:

- i) The remaining life to expiry: The time value of an option will decrease over its life as the risk of the writer of the option diminishes. At expiry, the time value will be nil.
- ii) The volatility of the prices of the underlying asset: The greater the volatility the higher will be the premium demanded by the writer of the option to compensate for the greater risk of unfavourable price movements.
- iii) The holding cost of the underlying asset - the amount of interest that the writer has to pay in order to cover the option.

In practice, investment banks and professional investors will use computer models to price options based on differing option pricing theories and volatility factors. The most common model is Black/Scholes formula which Stephen Ross of Yale University described as "the most successful theory not only in finance but in all economics".

### Benefits of Options to the Purchasers

- i) Currency options are useful to firms which have to tender for projects in a foreign currency. They can also be used wherever a contract in a foreign currency may or may not result in a payable or receivable, such as commissions, royalties or dividends of unpredictable size. Options allow treasurers to make money out of their view of the market while insuring them against getting it expensively wrong. Options are also the best way of hedging against exposures which might not happen. The forward contract is a blunter and less forgiving instrument of foreign exchange management - more like on-off switches.
- ii) Options are highly geared instruments. If market movements are favourable, speculative purchases can make considerable profits on the basis of a small investment (the premium) and limit their potential loss to the non-recovery of the premium.

### Benefits to the option writers

- i) A holder of the underlying instrument can increase returns at no additional up front cost by writing a covered call option. The premium received is additional income and providing any price increase of the underlying instrument is less than the strike price plus the premium there will be increased income and no lower capital gain.
- ii) If the market moves as expected and the option remains out of the money until expiry, the writer of a naked option (no offsetting cash position) will make a profit (the amount of the premium without having made any capital outlay).

### Risks and disadvantages to the purchaser

- i) While investors in other assets such as equity and debt may lose a proportion of their capital if the market value of the asset falls, they are unlikely to lose all their capital except in the event of the insolvency of the issuer. However, an option can readily lose all its value (i.e. the premium paid) if it is out of the money at or near expiry date.
- ii) The premium has to be paid up-front giving a cash flow disadvantage. This may be reduced by "delta" margins now operated by some clearing houses.

**Risks and disadvantages to the option writers**

- i) Where an investor writes a covered call or put option and subsequently the market moves so **that the** option is in the money the holder of the option will probably exercise the call or put. This means that the holder of the option will forego the opportunity to benefit from movements in the price of the underlying asset beyond the strike price plus the premium.
- ii) If the market moves to a significant extent the writer of a naked call or put can face substantial losses. Where the investor has written a naked call and the underlying price rises substantially above the strike price, to satisfy the commitment under the call the asset will have to be purchased in the **market** at the current market price. Similarly, where the investor writes a put and the price of the underlying asset **falls** below the **strike** price there will be a commitment to purchase the asset from the holder of the option at above the new market price.
- iii) With an American style option there will be uncertainty **as** to the exercise date which could give rise to a problem in meeting the **commitment** if the underlying instrument is not readily available.

Bankers admit that making money in options is risky. Financial engineers cannot be satisfied with the small dealing spreads between premiums though there are usually **four** times wider than on normal foreign exchange transactions. Most of the banks' profits come from taking on the risk that their customers wanted to get rid of. So profits from options trading are often erratic.

Options involve **two** types of exposures. The **first** arises from the difference between **the** options strike price and the corresponding price in the cash market. It affects the profit **or** loss that will be incurred if **the** option is taken up. This exposure can be calculated **with** certainty and fully hedged **at any point in** time. The bank buys or sells enough of the relevant currency in the cash market to **offset** its future exposure; every time the market moves the bank re-adjusts its position until the option eventually expires.

The second sort of exposure arises from volatility in the spot market which controls the probability that the option will be taken up at some future time. This exposure is impossible to measure. It can be accurately calculated only on a historical basis - when the **option** has expired. In order to price and to hedge options, **banks** look at the historic volatility of the cash markets and then guess what the future volatility will be. With computers to do the number crunching the banks then create an **offsetting** exposure by buying (or selling) more options.

**Exotic Options**

Vanilla options are limited to either buying or selling the **underlying asset**. A more complicated class of options, are categorised under "exotic options". A few examples are:

- **Barrier options** - options which either knock-in or out once spot trades at a predetermined level.
- **Digital Options** - options that pay a fixed pay out - "all or nothing" depending on the spot price.
- **Compound options** - an option to buy or **sell another** option.
- **Asian options** - an option which pays out the difference between the strike and the average of spot prices.
- **Look Back options** - permit the client to "**look back**" at the **high/low** range of spot prices over the life of the option and assign to himself a strike price within the **range** that is most profitable to his exposure.
- **Long Straddle** - the simultaneous purchase of a call and a put option. This strategy will be appropriate where the investor believes that the market is extremely **volatile** and liable to move considerably in either direction

An exotic option modifies either the payout or the probability or **both**. In the case of knock-out option, once spot has traded at a certain trigger price the option terminates with no value to the buyer. By including this condition, we are eliminating all the possible paths in which spot can trade there and therefore reducing the probability that the option

will pay out. This must, therefore, mean that the option premium is cheaper than the plain vanilla. A European (at expiry) digital on the other hand, modifies the option pay off.

Exotic options are not just for academic interest but they are extremely useful for customising trading views. They offer far more flexibility than the standard vanilla option.

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## 19.8 FORWARDS, FUTURES AND OPTION PRODUCTS

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With increasingly volatile interest and exchange rates and a rapid expansion in international trade, banks have been seeking to offer products to the customers which have the benefits of forwards, futures and options but with fewer disadvantages and risks.

The problem for corporate users of forwards or future is the risk that rates may move favourably and that due to the forward commitment they would have lost the opportunity for increased profits. The answer would appear to be the option but this involves, a premium often payable upfront. If rates move favourably then the treasurer will be accused of incurring unnecessary costs. Consequently while such a premium is insurance, and perhaps should be treated as a necessary expense it is not always viewed that way.

Banks have designed a range of products derived from the forward and option contracts which address these problems. Many of these products are sold with no premiums payable and allowing participants is potential gains. All have a cost usually in the eventual exchange rate given to the corporate user. Before using such products, purchasers should ensure that it matches their needs.

The following paragraphs explain a number of products which are available; they are combinations of forward and/or options sold in a convenient packaged form.

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## 19.9 FORWARD RATE AGREEMENT (FRA)

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FRA is a financial contract between two parties to exchange interest payments for a "Notional Principal" amount on settlements date, for a specified period from start date to maturity date. Accordingly on the settlement date, cash payments based on contract (fixed) and the settlement rate are made by the parties to one another. The settlement rate is the agreed benchmark/reference rate prevailing on the settlement date.

### *Characteristics*

- a) It involves quoting interest rate from a certain future date to a further future date as opposed to cash money market where rates are always quoted from the spot date.
- b) Although the agreement is always with reference to a certain principal sum, the principal amount is never exchanged.
- c) Since no exchange of principal takes place under FRAs, the purchase of the FRA has still to borrow in the cash market (if used as hedging strategy).
- d) On the relevant date the actual LIBOR is compared with the FRA rate and only the difference between the two rates is received or paid, as the case may be, on the principal amount agreed.

It will thus be observed that an FRA enables a borrower or lender to protect himself against interest rate movements - upwards or downwards - for a specific future period and enables it to fix its cost in advance and lock its profits or limit its loss.

### *Mechanics*

An agreement can be struck between two banks or a bank and its corporate client covering a three-month period that begins six months from the date of contract - called a "six against nine". One that covers six-month period beginning six months from the date of contract is called "six against twelve",

At the beginning of the agreed future period the contract rate is compared to the settlement Rate for that particular period. The interest differential is then used to work out the interest payable by one party to the other for the contract period on the notional

principal. As the interest is usually settled at the start of the contract period on settlement date, the interest is therefore discounted using the formula.

$$\frac{NP \times (SR - CR) \times CP}{36000} \times \frac{1}{1 + \frac{(SP + CP)}{36000}}$$

Where NP = Notional Principal  
 CP = Contract Period  
 SR = Settlement Rate  
 CR = Contract Rate

**Benefits**

- i) Simple and flexible way of fixing future interest rate.
- ii) Unlike financial futures there are no margin calls to be made.
- iii) Instrument can be tailored to precise requirements.
- iv) FRAs are available in currencies in which there are no financial futures.

**Risks and Disadvantages**

- i) No central market place, so liquidation is possible only by agreement to cancel or by a reverse.
- ii) Compared with financial futures, the spread in bid and offer rates is wide.

**Activity 1**

- 1. List few examples of Exotic options.

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- 2. What do you mean by "six against nine" and "six against twelve".

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**19.10 INTEREST RATE CAPS, FLOORS AND COLLARS**

Caps, Floors and Collars are options on interest rates and offer the purchaser protection from rising or falling interest rates.

**Caps :** This consists of an agreement stating that on prescribed future dates, if the interest rate is above a pre-specified index (e.g. LIBOR, Treasury Bill Rate) the seller will pay the buyer an amount equal to the additional interest cost until the next reference date. The cap is individually tailored for the customer by the bank and is in effect on the index for which the purchaser pays the seller a fee. Caps are usually based on short term interest rates and are not tradeable.

**Floors :** The reverse of a cap when interest rates, fall below a pre-specified index the borrower pays the difference in return for a fee received. The floor is the same as writing a series of put options with European exercise terms,

**Collars :** This is a combination of a cap and floor, giving a range in which the effective interest rate will fall. The contract is equivalent to purchasing a series of call options and writing a series of put options.

The maturity of caps, floors and collars is usually less than 3 years but with the introduction of capped FRNs banks have been able to offer longer term caps. The longer term caps are sold by the issuer of the FRN to the bank enabling longer-term caps to be offered to their customer.

#### **Benefits**

- i) The purchaser can **limit** exposure to movements in interest rates.
- ii) The life is usually longer than would be available in the options market.

The only Risk or disadvantage of these instruments is that these are **not** readily tradeable and once purchased, cannot be resold, they can only be cancelled with the **counterparty**.

#### **Types of Caps**

**Options on Caps:** An option to buy a cap in the future. Useful if a company is uncertain of future interest rates and is involved in a major tender and needs to be able to fix borrowing costs.

**Seasonal Caps:** A cap where the principal **protected**, **varies** according to the purchaser's seasonal borrowings.

**Interest Rate Options:** Options on interest rate futures

**Zero-Cost Collars:** If a company is particularly anxious to avoid paying any **premium** at all it may be able to negotiate a zero-cost collar. Under this arrangement the premium paid for buying the cap equals the **premium** received for selling the floor, leaving no premium to pay. **The** strike levels for the cap and the floor would have to be set accordingly. The collar will have a similar effect to a swap from floating rate debt into a fixed rate debt (or a floating rate investing into a **fixed** rate **investment**) since the cap and floor strike levels would be very close to each other.

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## **19.11 CURRENCY AND INTEREST RATE SWAPS**

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Of the many extra-ordinary **financial developments** of the past twenty years few can rival the burgeoning of the global markets for currency and interest rate swaps. Barely out of the starting date at the beginning of the 1980s the aggregate contracts outstanding in the OTC swap markets exceeded US\$ 36 trillion at the end of June 1998 up from US\$ 20 million at the end of June 1995.

A swap **can** be simply described as the transformation of one stream of future cash flows into another stream of **future** cash flows with different features. The essence of a swap contract is the binding of two counterparties to exchange two different payment streams over time, the payments being tied at least in part to subsequent - and uncertain - market price development. In most cases the prices concerned have been exchange rates or interest rates but they have increasingly reached out to equity indices and **physical** commodities notably oil and oil products.

#### **Swaps and the theory of comparative advantage**

Swaps have developed in recent years as a liability management tool used by corporates to reduce **their** funding costs. A swap can take place where each party can access a particular **market** (either currency or interest basis) on comparatively better terms than the others. **This** comparative advantage is then shared between the parties and the intermediaries, if any arranging transactions to lower their funding costs. The parties will enter the markets where they have the advantage and will agree to exchange payments and receipts between them which will result in better terms in their preferred market than if they had entered it directly themselves. Thus, the swap **market** in providing a bridge between markets involving different currencies and financial institutions have extended **the principle** of the theory of comparative advantage **from** the domain of commodities and **services** market to the international **financial markets**.

Today's financial swap market offers a dizzying **array** of products, yet **all** may be classified under three general headings in terms of their value to borrowers and investors **cost** saving or yield enhancement on existing activity, the hedging of existing risk and **opportunities** for new activity judged advantageous.

**a) Currency Swaps**

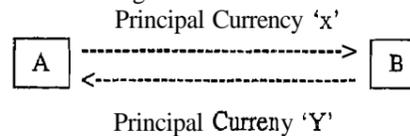
The first currency swap is thought to have been celebrated in 1981 between the World Bank - IBM swap which allowed the Bank to achieve its desired Swiss Franc funding and IBM its preferred Dollar funding at substantial cost saving to each in comparison to traditional direct bond issuance. Indeed, the currency swap between the World Bank and IBM was a strong catalyst to the development of the currency swap market. The prestige of these two names heightened awareness of the new product and built confidence in its legitimacy. The prestige of these names heightened awareness of the new product and built confidence in its legitimacy. The arbitrage of yield and credit differential provides the most common and compelling motivation for swap activity.

Currency swaps involve at least two currencies where cash flows in one or more currencies are exchanged for cashflows in another currency. In a straight currency swap, two counterparties will exchange principal amounts of different currencies usually at the prevailing spot rate. This exchange of principal can be either notional or actual. On the maturity of the swap the principal amounts will be re-exchanged at the same swap rate. Over the term of the swap the counterparties will make periodic exchanges of fixed rate interest in the different currencies.

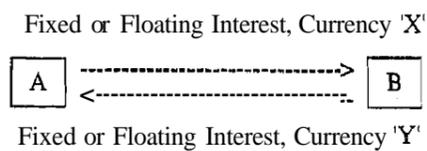
The effect of the transaction is similar to the swap deal undertaken by foreign exchange dealers (i.e. in a spot purchase and a forward sale of currency or vice versa) except that the interest rate differential is accounted for by periodic exchanges of interest as opposed to being expressed in the difference between spot and forward rates.

**Steps in the transaction**

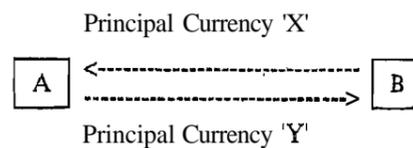
1. Initial Exchange at commencement



2. Coupons



3. Final Exchange at Maturity



Corporations will enter into currency swaps because it allows them to exploit their relative strength (comparative advantage) in different markets and reduce party's funding cost.

Assume that ABC Inc. (a US Corporation) is about to start operations in Germany. It is well known in the US debt markets but relatively unknown in the DM market. The company can therefore borrow at better rates in the US\$ than in the DM market. If the company can find a German company with the opposite profile i.e. XYZ GmbH (a German Company) wanting to finance a US subsidiary but not well known in the US credit market both parties can obtain funds in the currencies they want at cheaper cost than if they raised them directly themselves by a currency swaps as illustrated below.

ABC Inc. raises \$ 100 million by a 10 year bond issue in the domestic US markets at 7.50%. It could raise DM 200 billion-in the Eurobond market at 4.25%.

XYZ GmbH can raise DM 200 million for ten years in the Euromarket at 3.75%. It could raise \$ 100 million at 8.20%.

ABC Inc. will, therefore, issue a US\$ domestic bond and XYZ GmbH will make a Euro

DM bond issue. The two parties agree to swap the proceeds of those issues and to make periodic payments to reflect each other's interest liability in currency to the holders of the bonds. The swap will be reversed after 10 years when the bonds are due for redemption.

The cash saving to ABC Inc. is the difference between the DM interest paid on the swap and what would be payable if it made its own Euro-DM issue (i.e.  $4.25\% - 3.75\% = 0.5\%$  p.a.). Similarly the saving to XYZ GmbH is  $(8.20\% - 7.50\% = 0.70\%$  p.a.). It is possible that the rates would be adjusted so that both parties share equally in the saving or the stronger party receives more of the saving.

#### Types of Currency Swaps

**Fired Rate Currency Swap:** An alternative name for the plain vanilla currency swap as described above.

**Circus Swap:** Is an approximate acronym for combined currency and interest rate swap - also called a currency coupon swap. This is a hybrid between a straight currency swap and an interest rate swap whereby fixed rate interest in one currency is swapped for floating rate interest in another with an exchange and re-exchange of principal. These are a market unto themselves, combining all aspects of both currency and interest rate swaps. Thus a deal might be a swap from fixed three year DM to floating six month dollar LIBOR. Generally people will want six-month dollar LIBOR as one leg of the swap as you can get anywhere else in the dollar yield curve via a simple dollar interest rate swap.

**Principal Only Swap:** A transaction whereby there are periodic adjustments of principal between the parties based on two different exchange rates.

**Amortising Swap:** This is a conventional currency swap but the principal amount is declining over time.

**Without exchange of principal:** If the debt being hedged is already outstanding then there may not be an initial exchange of principal. There can be interesting uses for swaps where only the interest payments - not the final corpus - are swapped to another currency.

#### Benefits of Currency Swaps

These fall into four categories:

- i) **Lowering the cost of funds** : by entering into a currency swap a company might be able to significantly lower its cost of funds.
- ii) **Hedging of foreign exchange risk** : Companies with medium or long term currency flow mismatches often resort to currency swaps to either reduce or eliminate foreign exchange risk. For example, a company selling its output domestically denominated in the local currency but paying for the inputs in a foreign currency may be able to eliminate the currency risk by a medium term currency swap.
- iii) **Currency Diversification** : By entering into a currency swap or a series of such transactions a company can significantly reduce its risk to foreign exchange fluctuations. This is because, if there are two equally risky currencies whose movements are not perfectly correlated a portfolio containing a basket of these currencies will be less risky than each currency taken separately. This fundamental principle which underlies diversification strategies in all fields of asset or liability management, arises from the tendency of random fluctuations in one currency to cancel out opposite fluctuations in the other.
- iv) **Access to new markets** : A company can access an inaccessible or over expensive market via a transaction where the desired funding is obtained either directly or by a bank, say in dollars and accompanied by a currency swap between the desired currency and the dollar.
- v) Swaps permit an active liability management as the interest profile of a debt can be easily changed.
- vi) Swaps are a cost effective alternative to:
  - Buying, selling or shorting bonds
  - Buying or selling futures

**Risks of Currency Swaps**

- i) In the event of default by the counterparty each party has a credit risk to the extent that the currency they have swapped into has depreciated against the currency they have swapped from. In the example, if XYZ GmbH defaulted on the swap and the US\$ had appreciated against DM, ABC Inc. would have to continue to service the US\$ domestic bond out of DM assets which had depreciated in value. This risk can be reduced by using an intermediary bank.
- ii) It may not be possible or may prove expensive to terminate the swap, if market conditions change.
- iii) Administrative costs of calculating and making the swap payments.
- iv) The requirement of funds for the re-exchange of principal at maturity.

**b. Interest Rate Swaps**

The first publicised interest rate swap was completed in August 1982 and involved a US\$ 300 million seven-year fixed rate Euro bond issue by Deutsche Bank. The fixed interest rate was swapped into floating rate i.e. US Dollar London Inter Bank Offered Rate (LIBOR). The counterparty was a group of European banks that could not access the fixed rate Dollar bond market at acceptable rates at that time. Swap activity accelerated rapidly in the mid 1980s as the banks acting as intermediaries between swap counterparties began to trade to make markets in swaps. Now-a-days interest rate swaps are available in all major currencies and are still developing particularly in the emerging markets such as Asia.

An interest rate swap is an agreement between two parties to pay each other interest on a notional principal amount calculated on two different bases, for a stated period of time. The agreed amount is called "notional amount" and since it is not a loan or investment the principal amount is not exchanged initially or repaid at maturity. Interest payment streams are exchanged according to predetermined rules and are based upon the underlying notional amount.

Interest rate swaps will typically occur between one party. Borrower A, who can raise floating rate funds fairly cheaply but who wants fixed rate funds and Borrower B who finds it easier to raise fixed rate funds, but who wants floating rate funds at the lowest possible cost. Usually banks can obtain fixed rate funds more cheaply than corporations but want floating rate funds.

Corporations on the other hand, can often raise floating rate funds almost as cheaply as banks but want fixed rate funds. The swap will exploit the fact that investors in fixed rate debt are more sensitive to credit ratings than investors in floating rate debt to the advantage of both parties.

Following the first swap transaction in the early 1980s interest rate swaps have become one of the most commonly used instruments in the world of financial risk management by banks and corporate treasurers in managing the interest rate risks arising from both assets and liabilities. The popularity of swaps is attributable to the simplicity and flexibility of the product. Swaps provide a simple and effective tool for users to change their risk profile to a form that suits their individual needs.

**Types of Interest Rate Swaps**

**Basis Rate Swap** - A swap between two counterparties who have both raised floating rate debt but based on different indices. The floating reference rate can be switched at different pricing spreads to a whole host of other alternatives in order to match the exposure of the counterparty. These alternatives include:

- i) Three-month LIBOR
- ii) US prime rate
- iii) H15 one month commercial paper (CP)
- iv) T-bill rate

v) Tax exempt rate

**Zero Coupon Swap** - Allows an issuer who can issue cheap zero coupon debt to swap into conventionally floating rate debt. However, this swap structure exposes the issuer to a greater credit risk with the swap counterparty than with a plain vanilla interest rate swap because of the investment risk and the fact that the fixed rate interest is not received until maturity.

**Contingent Swap** : Option Swap or Swaption - represents the combination of an Interest Rate Swap with an Interest Rate Option. Depending upon the terms of the transaction it will give one party the right but not the obligation either to terminate before maturity the underlying swap or to extend the swap for a further period.

**Deferred Swap** - Swap with a commencement debt in future.

**Benefits of Interest Rate Swaps** -

- i) Each party can obtain the interest profile required at a reduced cost.
- ii) Swaps permit an active liability management as the interest profile of debt can be easily changed.
- iii) If interest rates move favourably it may be possible to terminate or sell the swap for a substantial cash sum.
- iv) In addition to the cost advantage interest rate swaps also provide an excellent mechanism for entities to effectively access markets which are otherwise closed to them whether by reason of credit quality, lack of name, familiarity or excessive use.

**Risks** :

- i) If there is no intermediary the parties are exposed to credit risk which may be difficult to monitor. The use of an intermediary bank may reduce this but there is exposure to the bank.
- ii) It may not be possible or it may prove expensive to terminate the swap if market conditions change. If the swap had odd payment dates it may be more expensive or difficult to terminate.
- iii) Administrative costs of calculating and making the swap payments,

**Activity 2**

1. Distinguish between Caps, Floors and Collars.

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2. The main benefits of a currency swaps are:

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3. Bring out the differences between the currency swaps and interest rate swaps.

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## 19.12 OPTIONS ON SWAPS

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**Spread Option** : The pricing on swaps does change, particularly in the two or three years' sector, where there are arbitrages against futures.

**Coterminous Reversal Option** : An entity that swaps to a floating rate may want to be able to reverse the swap with a guaranteed swap spread.

**Extendable/Puttable Swaps** : In order to pay a low fixed rate a borrower may do a swap where the counterparty has the option to extend the maturity of the swap. Therefore a five-year extendable to seven year can be done.

Equally an entity which has an asset can do a puttable floating to fixed rate swap whereby the swap can be terminated early.

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## 19.13 BENEFITS OF DERIVATIVES TO END USERS

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- i) Corporations benefit from derivatives through lower funding costs,
- ii) Derivatives allow firms to diversify their funding sources. Corporations also can diversify the currency exposure of their liabilities.
- iii) Derivatives allow corporate institutional investors, such as pension plans, to enhance asset yields.
- iv) Derivatives allow firms to expand their primary lines of business or diversify into new product and services.
- v) Corporations may use derivatives to manage the risk of anticipated expansion or business investments. By hedging the variance of the firms' net cash flows, hedging can sometimes help ensure that the company has sufficient cash to make positive net present value investments.
- vi) Derivatives provide an efficient method for all types of corporations to better manage the exposures to interest rate and currency risk that result from existing primary business lines.
- vii) Many institutions engage in derivative transactions not to manage risks but to increase their profits thus making derivatives a part of a firm's primary line of business.
- viii) Derivatives provide a low-cost and effective means for both corporations and institutional investors to respond quickly and cheaply to new information and manage their portfolios of assets and liabilities more efficiently as a result.

The innovation and growth in derivatives activity also has yielded substantial benefits to the world economy (i) by facilitating the access of corporations to international capital markets and enabling these organizations to lower their cost of funds and diversify their funding sources, (ii) by providing investors and issuers with a wider array of tools for managing risks and raising capital thus improving the allocation of credit and the sharing of risk in the economy and lowering the cost of capital formation and stimulating economic growth, (iii) by strengthening important linkage between markets, increasing market liquidity and improving market pricing efficiency.

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## 19.14 RISK ASSOCIATED WITH DERIVATIVES

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There are plenty of people who believe that derivatives are the financial instruments of the devil. A number of recent derivatives related disasters have fuelled concerns that derivatives have become demonized the ultimate dreaded 11 letter 'D' word. They have become inviting targets for witch-hunting. By reading the popular press accounts of these disasters one could easily conclude that derivatives were not only involved in these losses but were responsible for them as well. Such a conclusion would, to say the very least, be uncharitable and off the mark. Derivatives were around long before their recent arrival on

the public media scene. Even without any analysis, the longevity alone of these financial transactions suggests something more than what the headlines imply..

Derivatives are not inherently good or bad. Rather like electricity, they are dangerous if mishandled but have the potential to do tremendously good. It is not derivatives that have caused the recent derivatives - related disasters but it is how they are used. The main culprit was often the lax internal controls or failure to price risk properly.

#### **Risks associated with hedging instruments :**

Hedging instruments are intended to reduce risks resulting from changes in foreign currency exchange rates and interest rates. However, the hedging instruments themselves, generate specific risks, which include:

**Correlation Risk** : The risk that the gain on the hedge position will not offset the loss on the hedged item to the extent anticipated because the hedge and the hedged item did not move in tandem.

- **Basis Risk** : The risk that the difference between the spot price of the hedged item and the price of the hedging instrument will increase or decrease over time. The basis is sometimes also referred to as the spread.
- **Credit Risk** : The risk that the counterparty to the transaction will not honour its commitments. The creditworthiness of the other party is particularly important when dealing in instruments not traded on a securities or commodities exchange, such as forwards, swaps and privately negotiated options. Even with the instruments traded by exchange, such as futures and publicly traded options, companies need to assess the creditworthiness of the broker employed.
- **Opportunity Cost** : In exchange for protection from currency fluctuations, hedgers must generally be willing to:-
  - give up profits when currency moves in their favour
  - pay the premium on an option for the right to exercise, and
  - pay the related commissions and fees to the banker or broker who arranged the hedge.

An analysis of the total costs associated with a hedging strategy is critical to understand its overall economics.

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## **19.15 CORPORATE POLICY ON HEDGING**

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Proper hedging strategies can enable a firm to reduce risks associated with exposure. At the same time, if things are not well planned or if events do not transpire as expected, a company could find itself increasing rather than decreasing its exposure to losses. For example, the hedge may not correlate properly and losses may result from basis changes or the counterparty to the hedge position may default.

While the opportunities to hedge are always present, the potential risks and/or costs may be too great relative to potential gains. There will be other situations when it will be appropriate to hedge. However, many recently publicized financial losses have been attributed directly to the lack of understanding of the risk inherent in hedging strategies and the lack of appropriate internal control procedures to assess and monitor the implications of new and innovative hedging strategies.

#### **Identification of Exposure**

For those firms that are exposed to risks, identification of the risk is critical to effective management. The enterprise should periodically monitor its overall exposure to risk. Typically this is achieved by analyzing and summarizing its activities into exposure reports. Exposure reports disclose positions generating exposure as well as surplus or deficit positions that may need to be hedged. They generally include existing assets and liabilities and firm commitments and may also include anticipated transactions. If they do, probability ratings are generally applied to the anticipated transactions.

**Policies and Procedures**

Firms should have explicit policies, preferably in writing, defining the objectives of hedging transactions. The overall corporate hedging policy should be approved by the Board of Directors. Moreover the board and management must have a complete understanding of the nature, risk and economics of the hedging strategies, including authorized instruments and types of transactions. The policies should consider the business and other risks inherent in hedging instrument and the firm's risk philosophy.

The policies should encompass the firm's investment, financing and hedging philosophy and set forth guidelines which typically include:

- Approval and authorization for transaction initiation.
- Selecting and monitoring of brokers, dealers and counterparties.
- Hedging procedures including types of instruments and limits.
- Recording of transactions
- Periodic confirmation
- Management reporting including who in the organization should receive such reports.

Establishing limits over types of financial instruments, counterparties and traders helps to control risk since greater diversification decreases a company's exposure. Limits should be established on the amount that may be placed:

- In any one financial instrument maturity, entity, industry, country, credit rating, interest rate or market.
- With any one investment banking firm, bank broker/dealer or counterparty.
- By any one individual.

Criteria for selecting brokers/dealers, portfolio managers or investment advisers with whom the firm will deal should typically include.

- Knowledge of financial instruments.
- Long term experience
- Research capacity
- Strategy development
- Compatibility of the adviser's hedging strategies or techniques with the company's investment, financing, hedging philosophy and goals.
- Reputation
- a Financial standing within the industry.
- a Ability to execute transactions quickly and accurately.
- Integration with and responsiveness to the company's management information needs.
- Clarity and usefulness of reports received from third parties.
- Fees and margin requirements (if any)
- Reinvestment opportunities

Counterparties must be evaluated initially and monitored periodically thereafter by:

- Periodically obtaining and reviewing current financial statements.
- Requiring that such financial statements be audited by reputable accounting firms.
- Establishing standards for the financial statements (e.g. an unqualified audit opinion) and financial tests including minimum net capital and leverage - this review should be documented and approved by the appropriate levels of management.
- Obtaining internal control letters or similar third part reviews, if appropriate.

Changes to the list of authorized brokers and dealers and counterparties should be

approved in writing.

Specific agreements for certain hedging instruments and related procedures, including collateral requirements, margins and future-settling transactions should be developed and discussed with legal counsel. The terms and rights of parties to these agreements should be clearly defined.

procedures should be established to effectively segregate duties among individuals responsible for:

- Making investment and credit decisions
- Custody of securities
- Disbursement and receiving funds
- Record keeping
- Confirmation of positions and
- Performing reconciliation

#### Monitoring and Evaluating Results

Firms should assign responsibility for monitoring the results of hedging strategies and transactions. For example it is essential to monitor the results of hedging activities to ensure that the initial hedging objectives are being achieved by reducing the risks of unfavourable movements in the hedged item. Because the correlation between the hedge transactions and the hedged item may not remain at the expected level, the company may need to terminate, modify or initiate new hedging transactions.

Appropriate levels of management reporting should be specified for each type of hedging activity. Compliance with the policies and procedures should be reported on an exception basis along with the nature of actions taken to prevent the exceptions from recurring.

When a firm has numerous foreign currency hedges entered into by a number of "traders" the daily results of this activity should be closely monitored, independently confirmed and reconciled.

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### 19.16 DERIVATIVES DOCUMENTATION

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"Enforceability presents the greatest risk participants face in derivatives transaction"

Unlike stocks and bonds derivatives have been plagued by fears of what is commonly referred to as legal uncertainty. Those that buy or sell derivatives preach the perils of legal uncertainty for good reason. No market could survive if the losing party to every transaction could void the transaction after the losses had been incurred. It would be like the manager of a losing baseball team, declaring every game his team lost to be a rain-out after the ninth inning. Yet on a number of occasions in recent years, the losing parties in certain derivatives transactions have gone to court to try to void the transactions as illegal. In some instances those efforts have even been successful. The most well known instance involved is the case of *Hazell vs. The council of the London Borough of Hammersmith and Fulham* and others. In this case the House of Lords ruled that the London Borough of Hammersmith and Fulham did not have the powers to enter into derivatives contract. The decision voided five years worth of contracts and forced the local authority and the involved financial institutions to take losses. The decision also voided similar deals between more than 130 UK councils and 75 of the world's largest banks.

Legal uncertainty can also arise upon the insolvency of a counterparty especially regarding the status of close out netting agreements provided for in contracts such as swaps.

Documentation therefore is very important in derivatives transaction. Inadequate documentation may be a simple failure to document in writing an important term negotiated orally. There could be a long delay between an oral agreement and the signed writing of the agreement. During the delay a counterparty could attempt to avoid a loss by disaffirming the oral agreement.

Participants in the market for Over The Counter (OTC) derivatives have shown a remarkable ability to develop successful mechanisms for controlling risk. Product innovation is certainly a hallmark of the derivatives industry.

ICOM, IFEMA, ISDA Master Agreements have been significant innovations as the derivatives market has grown and matured. The use and design of master agreements has evolved in response to demands for documentations that reduces negotiating costs, addresses counterparty credit risk and helps ensure contract enforceability.

Many of the provisions of the master agreements are aimed at mitigating credit and legal risks, by allowing for (i) upfront risk assessment such as the provision of documents concerning credit risk as well as representations concerning enforceability, (ii) ongoing risk assessment including the periodic provision of documents, maintenance of covenants, use of "collateral" and mark to market margining. Provisions of these two types both help alleviating potential information asymmetries between counterparties and facilitate monitoring, (iii) ex- post risk control mechanism such as provisions for terminating the agreement early to limit exposure brought about by the occurrence or discovery of specific events. Early determination serves to protect parties from the risk of significant credit and legal developments arising from factors that may or may not be the fault of or under the control of the counterparty (event risk protection) or that may result from ex-post opportunism by counterparties (moral hazard). It may serve as an additional mechanism to help address problems with information asymmetries by, for example, deterring parties from making false or misleading representations.

#### Master Agreements

1. IFEMA (International Foreign Exchange Master Agreement) for spot and forward foreign exchange transactions.
2. ICOM (International Currency Options Master Agreement) for currency options.
3. ISDA (International Swap and Derivatives Association). The ISDA Master Agreement is a comprehensive omnibus document covering multiple derivative transactions including currency options and foreign exchange spot and forward transactions.

ISDA Master Agreement is used to document multiple types of transactions by most of the financial market participants internationally. The enforceability of the provisions is, also, tested in certain jurisdiction.

Any additions/deletions/modifications required to suit local market practices and regulations can be effected through the schedule of the agreement. The Master Agreement terms include the provisions mentioned in the schedule and the rules of interpretation confirm that in case of any inconsistencies between the master and the schedule, the schedule provision will prevail.

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### 19.17 INDIAN SCENARIO

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In India for long, the only hedging instrument available was the Forward Exchange Contract. As a step towards development of other derivative products, the Reserve Bank of India introduced Cross Currency Options in January 1994.

Presently the following derivative products are in use in India.

1. Forward Contracts
2. Cross Currency Options
3. Foreign Currency Rupee Swaps
4. Interest Rate Swaps
5. Currency Swaps
6. Interest Rate Caps/Collars (Purchase)
7. Forward Rate Agreements
8. Range Forwards
9. Ratio Range Forwards

India's derivative market is still to attain critical mass but it is already one of the fastest growing sectors of the domestic capital market. For the greater part of the past decades, market growth had been powered by transactions in G-7 currencies with offshore banks. But over the past four years, a nascent Indian Rupee (INR) onshore derivatives market has gradually developed. With increased market liberalization and a better appreciation of risks by Indian entities, the INR derivatives segment has the potential to become deeper, broader and more efficient.

In line with other global markets the ISDA Master Agreement has been accepted as the market standard in India. Its use has been prescribed by the Foreign Exchange Dealers' Association of India (FEDAI).

The range and complexity of derivatives instruments warrant considerable development effort by the market participants including investments in operating systems, risk management infrastructure and in hiring and training front office and back office personnel.

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## 19.18 SUMMARY

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Recent years have witnessed a sharp acceleration in the pace of innovation transforming the international financial system in important ways. Major new financial instruments have been created or have dramatically increased their role in the financial structure. The stimulus for financial innovation is strong arising from the interaction of a changing regulatory environment, expanding technology, volatile markets, and growing competition among financial institutions.

The need for hedging against financial risk has fuelled the demand for financial engineering, the creation of instruments to limit financial risk. Derivatives have become a buzz word of today. Derivatives are contracts whose value is derived from the value of some underlying asset such as currencies, equities or commodities, from an indicator like interest rates or from a stock markets or other index. The derivative instruments that result are variously called forwards, futures, options, swaps, caps, floors collars, captions, swaptions, range forward, ratio range forward, forward rate agreements, swaptions, captions, floortions and other exotic names like butterflies, condors etc.

All derivatives are either constructed with or are one of the two simple and fundamental financial building blocks: forwards and options. A forward obligates one counterparty to buy and the other to sell an asset in the future for an agreed price. In return for the payment of a premium, an option contract gives the buyer the right but not the obligation, to buy or sell an asset in future at an agreed upon price. Once these building blocs are defined the cash flows on virtually any derivatives transaction can be viewed as the net cash flow on a portfolio comprised of some combination of these building blocs.

Currency and Interest Rate Swaps have burgeoned over the past twenty years. A swap can be simply described as the transformation of one stream of future cash flows into another stream of future cash flows with different features.

Derivatives instruments are intended to reduce risks resulting from foreign currency exchange rates and interest rates. However, these hedging instruments themselves generate specific risks.

It is therefore imperative to have corporate policy on hedging, to identify exposures and to have explicit policies defining the objectives of hedging transactions, to establish limits over types of financial instruments and counterparties, segregate duties among individuals responsible for various activities, and to monitor and evaluate results,

Proper documentation is of vital importance in derivatives transaction. ICOM, IFEMA and ISDA Master Agreements address counterparty credit risk, legal risk and help ensure contract enforceability. ISDA Master Agreement is used to document multiple types of transactions; it is an omnibus, comprehensive document.

In India, for long, the only hedging instrument available was the forward exchange contracts, Since 1994 a number of new products have been introduced by the RBI.

India's derivative market is still to attain critical mass but it is already one of the fastest growing sectors of the domestic capital market.

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## 1.9.19 KEY WORDS

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**American Style Options** : The holder of an American style option has the right to exercise the option at any time during the life of the option, up to and including the expiry date.

**Arbitrage** : A guaranteed or risk-less profit from simultaneously buying and selling instruments that are perfect equivalents, the first being cheaper than the second.

**At the Money** : Where the strike price and the market price of an option are the same, it is "at the money".

**Basis** : The difference between the prices of a futures contract and the underlying.

**Basis Swap** : it is a contract in which both counterparties make payments linked to floating rates but with different indices for each counterparty.

**Black-Scholrs Model** : The original closed form (analytical) solution to option pricing developed by Fisher Black and Myrton Scholes in 1973. In its simplest form it offers a solution to pricing European style option on assets with interim-cash payouts over the life of the option.

**Call** : An option in which one investor acquires the right but not the obligation to buy an underlying asset from another investor for a specified price during a specified period of time.

**CAP** : A contract whereby the seller agrees to pay to the purchaser in return for an upfront premium or a series of annuity payments the difference between a reference rate and an agreed strike rate when the reference exceeds the strike.

**Caption** : An option on a cap.

**Collar** : The simultaneous purchase of an out-of-the-money call and sale of an out-of-the-money put (or cap and floor in the case of interest rate option).

**Coupon Swap** : A variation of the currency swap but with no final principal. It involves an exchange of coupons only.

**Cross-Currency Swap** : It involves the exchange of cash flows in one currency for those of another.

**Deferred Swap** : A swap in which the payments are deferred for a specified period, usually for tax or accounting reasons.

**Derivatives** : A derivative instrument or product is one whose value changes with changes in one or more underlying market variables such as equity or commodity prices, interest rates or foreign exchange rates. Basic derivatives include forwards, futures swaps, options.

**European Style Option** : An option which may only be exercised on the expiry date.

**Extendable Swap** : A swap in which the fixed rate payer has an option to extend the swap.

**Exercise Price (Strike Price)** : The price provided for in an option contract at which the underlying security can be bought (for a call) or sold (for a put) on or before the expiration date of the option.

**Exposure** : A firm's exposure is its vulnerability to loss from unanticipated events.

**Financial Engineering** : The use of financial instruments such as derivatives to obtain the desired mix of risk and return.

**Floor** : A contract whereby the seller agrees to pay to the purchaser in return for upfront premium the difference between a reference rate and an agreed strike rate should the strike rate exceed the reference rate.

**Forward Exchange Contract** : A forward exchange contract is a legal agreement between two parties to purchase and sell a specific quantity of foreign currency at a specified price but with delivery and settlement at a specified future date.

**Forward Rate Agreement** : FRA allows purchasers/sellers to fix the interest rate for a



specified future period in advance.

**Future** : A future is a contract to buy or sell a standard quantity of a given instrument at any agreed price on a given date. A future is similar to a forward contract and differs from an option in that both parties are obliged to abide by the transaction. However, there are differences between futures and forwards.

**Hedge** : To hedge is to reduce risk by making transactions that reduce exposure to market fluctuations.

**In the Money** : An option with intrinsic value. A call option is in the money when its exercise price is less than the price of the underlying security. A put option is in the money when its exercise price is greater than the price of the underlying security.

**Interest Rate Swap** : An agreement to exchange net future cash flows. Interest rate swaps most commonly change the basis on which liabilities are paid on a specified principal. They are also used to transform the interest basis of assets.

**Legal Risk** : The risk that a counterparty to a transaction will not be liable to meet its obligations under law.

**Option** : A contract that gives the purchaser the right but not the obligation to buy or sell an underlying at a certain price (the exercise or strike price) on or before an agreed date (the exercise period). For this right the purchaser pays a premium to the seller. The seller (writer) of an option has a duty to buy or sell at the strike price should the purchaser exercise his right.

**Out of the Money** ; A call option is out of money when its exercise price is greater than the price of the underlying security. A put option is out of the money when its exercise price is less than the price of the underlying security.

**Over the Counter (OTC) Market** : A market without a centralized exchange where trading is normally done via computers and telephone lines, co-ordinated through brokers/dealers.

**Put** : An option by which one investor acquires the right, but not the obligation to sell an underlying asset to another investor for a specified price during a specified period of time.

**Range Forward** ; The simultaneous purchase of an out-of-the-money currency put option and sale of an out-of-the-money currency call option at different strike price.

**Ratio Range Forward** : A variation of the Range Forwards. To create a wider range to maintain zero cost, the options bought are a proportion of the options sold.

**Swap** ; An agreement to exchange one set of cash flows for another.

**Swaptions** : An option to enter an interest rate swap.

**Volatility** ; A measure of the variability (but not the direction) of the price of the underlying instrument.

**Yield Curve** : The yield curve is a graphical representative of the term structure of interest rates. It is usually depicted as the spot yields on bonds with different maturities but the same risk factors, plotted against maturity.

**Zero-coupon-Swap** : It is an agreement where at least one of the parties makes a single lump-sum payment at maturity i.e. interest payments compounded over the life of the swap.

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**19.20 SELF-ASSESSMENT QUESTIONS**

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1. Discuss the forces stimulating innovation in the financial services industry.
2. Define the terms "financial engineering" and "derivatives". Name a few derivative products.
3. What are the differences between forward contracts and futures?
4. What are Options? What distinguishes options from forward contracts and futures?
5. Discuss the factors that go into the pricing of options.
6. What are benefits and risks of options?
7. What are FRAs, their characteristics benefits and risks?
8. What are currency swaps, their benefits and risk?
9. What are interest rate swaps, their benefits and risks?
10. What are the benefits of derivatives to end users?
11. What are the risks associated with derivatives and corporate strategies to deal with them?
12. Discuss the Indian scenario in financial derivatives.
13. "Enforceability presents the greatest risk participants face in derivatives market". Discuss with reference to documentation for derivatives.

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**19.21 FURTHER READINGS**

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1. Roy C. Smith and Ingo Walter, 1997, *Global Bankers*, Oxford University Press, New York.
2. Robert Soloman, 1999, *Money on the Move: The Revolution in International Finance since 1980*, Princeton University Press, New Jersey.
3. George Crawford and Bidyut Sen, 1996, *Derivatives and Decision Makers: Understanding and Managing Risk*, John Wiley & Sons Ltd.
4. Joel Kurtzman, 1993, *Death of Money: How the Electronic Economy has destabilised the World's Markets and Created Financial Chaos*, Simon & Schuster, New York.
5. Elinor Harris Soloman, 1997, *Virtual Money: Understanding the Power and Risks of Money's high-speed Journey into Electronic Space*, Oxford University Press, New York.

**MS-424: INTERNATIONAL BANKING MANAGEMENT**  
**Course Components**

Block	Unit Nos.	Print Material
<b>I</b>		<b>INTERNATIONAL BANKING : AN OVERVIEW</b>
	1.	International Banking: An Introduction
	2.	Institutions in International Banking
<b>II</b>		<b>LEGAL &amp; REGULATORY FRAMEWORK</b>
	3.	Regulatory Framework
	4.	Capital Adequacy, loan loss provision and other Regulatory Controls
	5.	Basel Concordat
	6.	Legal Issues in International Banking
	7.	Accounting issues in International Banking
<b>III</b>		<b>INTERNATIONAL BANKING OPERATIONS MANAGEMENT</b>
	8.	Raising of Resources
	9.	Capital Markets: Sources of External Finance.
	10.	Foreign currency Accounts
	11.	Deployment of Resources
	12.	Treasury Management : An Introduction
	13.	Treasury Management: Tools and Derivatives
	14.	Forex Management
<b>IV</b>		<b>RISK MANAGEMENT IN INTERNATIONAL BANKING</b>
	15.	Risk Management: Concepts and Types
	16.	Managing Risk
<b>V</b>		<b>SPECIAL ISSUES</b>
	17.	Technology and International Banking
	18.	Globalisation and International Banking
	19.	Financial Innovations in International Banking