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NISM SERIES IV – INTEREST RATE
DERIVATIVES EXAM



NISM IV – INTEREST RATE DERIVATIVES EXAM**SHORT NOTES BY PASS4SURE.IN****Chapter 1: Introduction to Interest Rate, Interest Rate Instruments and Fixed Income Market****The Interest Rate Concept:**

Debt is a concept in which the receiver of the favour is willing to return the favour with agreed rate of return for using the favour for the time period. The agreed rate of interest is expressed as percentage per annum. Assets borrowed can include cash, consumer goods, vehicles, property, etc. Interest rates apply to most lending or borrowing transactions. The interest rate is the cost of debt for the borrower and the rate of return for the lender. Interest rates are typically quoted as the annual percentage rate which is generally termed as nominal annual interest rate.

The interest rate is dependent upon various factors. When the borrower is considered to be low risk by the lender, the borrower will usually be charged a lower interest rate. If the borrower is considered high risk, the interest rate that they are charged will be higher.

Factors like inflation, liquidity, duration, central bank policy, price of competing assets, etc., influence the movement and level of general interest rates in the market. Following are a few factors that influence the interest rates in the economy:

1. Demand for Money
2. Supply for Money
3. Fiscal deficit and government borrowing
4. Inflation
5. Global Interest Rates and foreign exchange rates
6. Central Bank Actions

The **effective interest** rate can be different from annual interest rate due to compounding effect.

$$\text{Effective interest rate} = [(1 + \text{annual interest rate}/n) n - 1]$$

The **nominal interest** rate is the stated interest rate (coupon rate) of a bond. The nominal interest rate denotes the rate that the bond issuer pays to the bond holder. The nominal interest rate adjusted for inflation is called **real interest rate**. The relationship between real and nominal interest rates can be described in the equation: $(1 + r) \times (1 + i) = (1 + R)$

Fixed Income Securities

Fixed Income Securities are debt instruments that pay a fixed amount of interest - in the form of coupon payments - to investors. The interest payments are made periodically while the principal invested returns to the investor at maturity

Key Components of Fixed Income Securities:

Issue Price is the price at which the bonds are issued to the investors.

- **Face Value (FV)** is also known as the par value or principal value.
- **Coupon / Interest** is the cash flow that are offered by a particular security at fixed intervals / predefined dates.
- **Coupon Frequency** means how regularly an issuer pays the coupon to holder.
- **Interest Payment Dates** means dates on which interest/coupon is paid to bond holder by the issuer.
- **Maturity date** is a date in the future on which the investor's principal will be repaid.
- **Call / Put option** date is the date on which issuer or investor can exercise their rights to redeem the security before maturity date.
- **Maturity / Redemption Value** is the amount paid by issuer other than coupon payment.

Classification of fixed income securities based on the Type of Issuer:

- Government Bonds / Sovereign Bonds / Gilt edged Bonds
- Municipal Bonds
- Corporate Bonds
- Securitized Debt

Classification of fixed income securities based on Maturity

- Overnight Debt / Borrowings
- Ultra-Short-Term Debt (Money Market)
- Short Term Debt
- Medium Term Debt
- Long Term Debt
- Staggered Maturities

Classification of fixed income securities based on Coupon

- Plain Vanilla Bonds
- Zero-Coupon Bonds
- Floating Rate Bonds
- Caps and Floor
- Inverse Floater
- Inflation Indexed Bonds
- Step Up/Down Bonds
- Deferred Coupon Bonds
- Deep Discount Bonds

Classification of fixed income securities based on Embedded Options

- Straight Bonds
- Bond with a Call Option
- Bond with a Put Option
- Bond with Call and Put Option

Classification of fixed income securities based on Security

- Secured debt
- Unsecured debt
- Subordinated debt
- Credit enhanced bonds

Other Instruments

- Perpetual (consol bonds)
- Annuities
- AT1 (Additional Tier-1) Bonds & AT2 Bonds
- Convertible Bonds
- REITs (Real Estate Investment Trusts)
- InvITs (Infrastructure investment trusts)
- Green bonds
- Tax-free bonds
- Tax Saving Bonds
- Asset Linked Bonds

Concept of risk-free interest rate

One should note that fixed-income security does not mean fixed-return security. It merely means that the timing of cash flows (and in certain cases, the size of cash flows, too) is fixed and known in advance. It does not necessarily guarantee a fixed return. There are some additional Risks, mainly:

- Credit risk: The Company may not be able to pay interest and principal as per schedule.
- Price Risk (Interest rate risk): One cannot demand prepayment from the issuing company but should sell it in the secondary market and the price may be higher or lower than the initial purchase price.
- Reinvestment risk: The interim cash-flows from a fixed income security are known in advance. But since the reinvestment rates are not known in advance, it is called reinvestment risk.
- Credit Risk: For borrowers other than the sovereign government, there is some chance of default. The difference between them is called the “credit spread”.

Term Structure of Interest Rates

The term structure of risk-free rate is the most important tool in any valuation because it represents the ultimate opportunity cost. It is the rate an investor can earn without any risk of default or loss for a given term. Any other competing alternative has a risk, which has to be priced and added to the risk-free rate for the same term as the “risk premium.” The interest rate of different terms is determined by the demand supply of money for different tenors.

The term structure has different shapes but four of the following account for most of the shapes:

1. Normal Yield Curve

This is an upward sloping yield curve indicating higher yield for higher maturity. Long term yields are higher compared to short term yields as the risk premia is higher for higher maturities.

2. Inverted Yield Curve

In this kind of curve, the short-term yields are higher than the long-term yields. At times, the policy rates are kept high to bring down excess demand and reduce financial bubbles created due to easy availability of credit and use of high leverage by the borrowers. At times, severe asset liability mismatch may also produce inverted yield curve.

3. Flat Yield Curve

Here yields remain constant irrespective of time to maturity. There is no difference between short term yield and long-term yield indicating no extra premium for higher maturities.

4. Humped yield curve

At times, yield curves can be humped, and the short term and long-term yields would be lower than medium term yield.

Term Structure of Rates: Shifts

Shift	Description
Steepening	Difference between LR and SR rises or widens. The curve shifts in anti-clockwise direction
Flattening	Difference between LR and SR falls or narrows. The curve shifts in clockwise direction.
Parallel	All rates move in the same direction by same extent

Simple interest is basically an interest rate without any reinvestment option. When interest is accrued for more than one period, it becomes necessary to distinguish between simple interest (SI) and compound interest (CI). Under **compound interest**, the money received at various points of time is reinvested to earn a higher effective rate of return.

Simple interest (SI) = Principal * Interest rate p.a. * Time in years

Interest for Year 1 (I1) = Principal * Interest rate p.a. * (Time which is 1 year)

Interest for Year 3 (I3) = (Principal + I1 + I2) * Interest rate p.a. * (Time which is 1 year)

Day count fraction (day count basis): It specifies the conversion of payment period into year fraction. For this, we must agree on counting the number of days in a year and in the interest accrual period.

- Actual/Actual day counting: This takes into account the actual number of days between the last coupon date and the next coupon date. In India this is widely used for bond securities.
- 30/360 (European) Day Counting: This day count convention considers all months are equal and have fixed 30 days in a month and 360 days in a year.

Accrued interest is a market practice peculiar to bond market. Accrued interest applies only when a bond is a coupon bond. For the secondary market trades of such bonds, there are two prices. They are “clean price”: the price at which the bond is negotiated; and “dirty price” (also known as “invoice price”): the price at which the bond is settled. Dirty price is always higher than the clean price by the amount of accrued interest. In other words, dirty price is clean price plus accrued interest.

Coupon, Current Yield and Yield-To-Maturity

Coupon Income: A coupon income is the regular flow of money or return to the investor or lender as promised by the borrower.

Capital Appreciation: During the life of investment in a bond, market interest rate changes and the present value of the bond would also change as the coupon is fixed. This change could be positive/negative leading to a capital appreciation or depreciation.

Reinvestment income: The investor receives periodic interest or coupon on the debt investment. The same is reinvested on assets which would yield further income.

Yield Measures

Current Yield: Current yield is the simplest measure of the yield on a bond and oldest form of yield used in the market to compare various bonds in terms of their relative attractiveness of investment.

$$\text{Current Yield} = \text{Coupon/Clean Price} * 100$$

Yield to Maturity (YTM): The YTM is the discount rate that equates the discounted future cash flows and principal to be received with the present value or current price of the bond. In other words, it is the internal rate of return (IRR) or the expected rate of return on the bond.

Yield for Money Market: Yield measures for money market instruments are annualized but not compounded. Discount yield computes the expected return of a bond purchased at a discount and held until maturity:

$$\text{Discount Yield} = (\text{Face value} - \text{Price}) * 360 / (\text{Face Value} * \text{Days to maturity})$$

Effective Yield: The equivalent rate is the rate which produces same final amount at the end of 1 year if simple interest is applied.

Valuation of Bonds: Readers are requested to go through the calculations and methodologies given in the NISM book for this part to get a better understanding.

Spot Rate Bond Price and YTM

Spot rate (also known as “zero rate”) is the true return on investment. It considers premium/discount in bond price, capital gain/loss at redemption and reinvestment of interim income.

To make the different zero rates/spot rates easier for interpretation, we average all the rates into a single number, which is called YTM.

Price-Yield Relationship

The price-yield relationship is inverse in nature. When we calculate the relationship, we use only the clean price. If we want to plot the price-yield relationship of two bonds, we can compare their relative effective riskiness.

The price-yield relationship can be summarized here as follows:

1. The inverse relation between a bond's price and rate of return is given by the negative slope of the price-yield curve. The movement across the curve is nonlinear.
2. The bond with larger maturity time would have higher sensitivity to interest rate changes.
3. The lower a bond's coupon rate, the greater is its price sensitivity

Relation between Coupon Rate(C^R), Yield (R), Price (V), and par value (F)

		if $C^R = R \Rightarrow V_o^b = F$: Bond valued at par.
Bond-Price		if $C^R < R \Rightarrow V_o^b < F$: Bond valued at discount.
Relation 1:		if $C^R > R \Rightarrow V_o^b > F$: Bond valued at premium.

The coupon rate (CR), current market yield (CY) and yield-to-maturity (YTM) are related such that:

Bond Selling at	Relationship				
	CR	=	CY	=	YTM
Par	CR	<	CY	<	YTM
Discount	CR	>	CY	>	YTM
Premium	CR	=	CY	=	YTM

Risk Measures of Fixed Income Securities

Price risk and reinvestment risk always work in the opposite way. For example, if the market interest rate rises, the bond price falls but reinvestment income rises. Similarly, if the market interest rate falls, the bond price rises but reinvestment income falls. The change in bond price is instant after the change in interest rate but the effect of reinvestment income is slow over a period of time.

Price Volatility Characteristics of Option Free Fixed Income Securities

Each bond has a unique volatility stream with respect to change in interest rate. Volatility stream is nothing but variability in volatility or sensitivity of a bond with respect to the given yield or interest rate changes. A bond with long maturity may have higher sensitivity for a given change in interest rate vis-à-vis a shorter maturity bond.

There are four basic properties with regard to the price volatility of an option-free bond:

- i. The percentage change in price due to a change in yield will be different for different bonds where their coupons, maturities and traded yields are different.

- ii. When yield changes are very small, the percentage price change for a given bond remains more or less the same irrespective of increase or decrease in the yield.
- iii. When yield changes are large, the price change for the bond is different for the same increase and decrease in the yield.
- iv. When yields fall, the price changes are bigger than the price changes when yield rises by the same magnitude

Understand the Concept of Duration

Duration of a bond is the time weighted average of the present value of bond's future known cash flows. It is also called weighted average maturity or the payback period of the bond. Since the bonds have fixed maturities and cash flows come at various points in time, we need to put them in one single explanatory element to understand the relative and effective maturity of a bond vis-à-vis another as well as to understand the riskiness of the bonds.

Macaulay duration: It is an extremely important concept for understanding bond price sensitivity. It is the weighted average of the time to get the future cash flows from a bond. It is measured in units of years. In simple terms, this concept tells the weighted average time that we need to hold a bond in the portfolio so that the total present value of the future cash flows is equal to the current market price of the bond.

We typically use the following formula for deriving Duration of a bond:

$$\text{Mac Duration} = \frac{\sum_{t=1}^n PV(CF_t) * t}{\text{Market Price of Bond}}$$

$$\text{Or, Mac Duration} = \frac{\sum_{t=1}^n \frac{t \cdot C}{(1+Y)^t} + \frac{n \cdot M}{(1+Y)^n}}{\text{Market Price of Bond}}$$

where:

Mac Duration = duration of the bond;

CF_t = cashflow at time t;

t = time period of the cashflow;

n = number of periods to maturity;

Y = the yield to maturity (market interest rate).

Some Important Duration Relationships are summarized below:

- Coupon is inversely related to Duration. Higher coupon means lower duration. This is mainly due to the fact that we receive large part of the income or cash flows at the early stage.
- Yield to maturity is inversely related to duration. Higher yield = lower Duration and vice versa.
- Duration increases with maturity.
- For zero coupon bond, duration is equal to its maturity. For simple coupon paying bond with no embedded features, duration is lower than its maturity.

The **duration of a portfolio** is equal to the weighted average of the duration of the bonds in the portfolio.

Modified Duration is an adjusted measure of Macaulay duration to help in the estimation of a bond's price sensitivity to changes in interest rates. In other words, it illustrates the effect of a 100-basis point (1%) change in

interest rates on the price of a bond. It is important to note that modified duration shows the volatility of a dirty price.

To find the modified duration, all an investor needs to do is take the Macaulay duration and divide it by $1 + (\text{yield-to-maturity} / \text{number of coupon periods per year})$.

Price Value of a Basis Point is simply the change in price in terms of currency of the bond, if the yield changes by 1 basis point (0.01%).

Convexity Measure: Duration is derived from the first derivative of the Bond price equation. Mathematically, duration is a first approximation of the price/yield relationship. Modified duration is an approximation of the percentage change in bond price for a given change in yield. In fact, it is accurate only for very small and parallel shifts in the yield curve. The actual price change curve looks more convex vis-à-vis the linear line suggested by modified duration. Hence, we need to look at the effect of convexity on the price change to figure out better precision.

Convexity measures how the bond's duration—and by implication, its price—will change depending on how much interest rates change. Convexity is a measure of the sensitivity of a bond's price to changes in yield which is not explained by duration due to non-linear relationship between price and yield.

$$\text{Convexity} = \frac{1}{P \times (1+y)^2} \sum_{t=1}^T \left[\frac{CF_t}{(1+y)^t} (t^2 + t) \right]$$

Where,

P= Bond price

Y= Yield to maturity

T= Maturity in years

CF_t= Cash flow at time t

The change in the price of a bond can be summarized as follow:

$$\text{Change in price} = \text{Duration effect} + \text{Convexity effect}$$

Role and Importance of Debt Market

Firms need finance for daily operations, typically raised through debt and equity. Debt involves borrowed money repaid with interest, while equity raises funds by selling ownership stakes. Debt is a charge on income, whereas equity returns are a share of company profits. Governments also borrow to manage liquidity or fund long-term development. Depending on purpose and duration, various debt instruments are used to raise funds. The debt market enables borrowing through these instruments, catering to investors with different risk profiles. Debt instruments are essentially loans or IOUs, with fixed interest payments and principal repayment over a specified period, earning them the name “Fixed Income Securities.” Using debt for operations and growth is a form of

leverage that allows owners to retain control. However, excessive debt can hinder growth or lead to bankruptcy. Therefore, firms must carefully balance debt and equity based on a thorough assessment of each option's pros and cons.

Governments issue the most debt to fund expenditures, and a developed debt market helps them borrow at lower costs. A liquid market improves pricing efficiency and reduces reliance on banks by distributing risk among investors. Debt can be raised through bank loans or bond issuances, with corporate bonds offering a lower-cost option for companies.

A strong debt market supports long-term investors like pension funds and insurance firms by matching long-term liabilities. It also attracts retail and collective investment schemes. The primary market allows direct issuance—governments via auctions and corporates via private placements. The secondary market offers liquidity, price discovery, and insights into credit risk.

Debt issuance involves regulatory processes like underwriting, credit ratings, and listings. High regulatory costs often push smaller firms toward bank loans over market issuance. A robust debt market depends on a sound legal and regulatory framework.

Primary and Secondary Debt Market in India

The debt market deals in both the Government debt as well as in non-Government debt instruments.

Thus, the three critical participants in the debt market are:

- Issuers are Governments, commercial banks, public sector companies, private corporate firms
- Intermediaries are investment banks and merchant banks.
- Investors are the private corporate treasuries, collective investment vehicles like mutual funds, insurance companies, commercial banks, pension funds, high net worth Individuals, etc.

Investors can further be classified as domestic and international investors. The Reserve Bank of India and the Securities and Exchange Board of India are the main regulators in the Indian debt market.

Indian Debt market typically has three distinct segments based on issuer category

- Government debt, known as “G-sec” market with Government of India issuing dated papers, Treasury Bills and State governments issuing State Development Loans of various maturities
- Public sector units (PSU) and Banks issuing instruments to raise resources from the market
- Private sector raising resources through issuance of debt papers.

Debt instruments are issued in the **primary market** where initially they are subscribed by the various investors who may trade in them subsequently in the **secondary market**.

In the primary market, Government securities & Treasury Bills are issued through auctions through Competitive Bidding or Non-Competitive Bidding.

Secondary market trading takes place through:

- Negotiated Dealing System-Order Matching (NDS-OM)
- Over the Counter (OTC)/Telephone Market
- NDS-OM-Web
- Stock Exchanges
- RBI Retail Direct Scheme

OMOs or Open Market Operations are the market operations conducted by the RBI by way of sale/ purchase of GSecs to/ from the market with an objective to adjust the rupee liquidity conditions in the market on a durable basis.

Repurchase (buyback) of G-Secs is a process whereby the Government of India and State Governments buy back their existing securities, by redeeming them prematurely, from the holders.

Public Issue means an invitation by a company to public to subscribe to its debt securities offered through a prospectus. SEBI regulations require all public issues of debt to be listed on one or more recognized Stock Exchanges,

Private Placement refers to an offer of sale of debt securities by an issuer to a select group of people/institutions.

Money Market

Money Market is a short-term market and handles instrument from 1 day to 1 year. It is mostly used by Government, Banks and other corporate entities to tide over short-term requirements of funds.

Money market is typically divided into two segments: (a) Borrowing and Lending segment with or without collaterals; (b) Asset Market involving purchase and sale of money market instruments. They are as follows:

- Call Money
- Notice Money
- Term Money
- Market Repo
- Triparty Repo
- Treasury Bills
- Cash Management Bills
- Commercial Paper
- Certificate of Deposit

Chapter 2: Interest Rate Derivatives

Derivative is something that is derived from another thing called the underlying. The price of derivatives is determined by the price of underlying, and not by the demand-supply for derivative. The future date is the second requirement for the settlement of the derivative. They also provide the ability to buy the underlying without fully paying for it immediately or sell it without delivering it immediately. Derivatives are tools to manage price risk. Following are the approaches to risk management:

Approach	Explanation
Speculation	Taking risk (more formally called “trading”) It results in the possibility of positive return (i.e., profit) or negative return (i.e., loss) in future
Hedging	You are already exposed to risk and hedging eliminates that risk and locks in the future return at a known level.
Insurance	You are already exposed to risk and insurance selectively eliminates the negative return but retains the positive return. It has an explicit upfront cost, unlike speculation and hedging, which do not have any cost. It requires a particular derivative called option to implement it.
Diversification	It reduces both return and risk but in such a way that risk is reduced more than return so that risk is minimized per unit return (or, alternately, return is maximized per unit risk).

Key Economic Functions of Derivatives:

- Hedging risk exposure
- Price Discovery
- Market efficiency
- Access to unavailable assets or markets
- Price Stability
- Price Speculation

Products in Derivatives Market

Forwards are a contractual agreement between two parties to buy/sell an underlying asset at a certain future date for a particular price that is pre-decided on the date of contract.

Forward Rate Agreement (FRA) is an interest rate derivative contract that involves exchange of interest payments on a notional principal amount, on a future date, at agreed rates, for a defined forward period.

A **futures contract** is similar to a forward, except that the deal is made through an organized and regulated exchange rather than being negotiated directly between two parties.

An **Option** is a contract that gives the right, but not an obligation, to buy or sell the underlying on or before a stated date and at a stated price.

Interest Rate Option (IRO) is an option contract whose value is based on interest rates or interest rate instruments.

An Interest Rate Cap is a series of interest rate call options (called caplets) in which the buyer of the option receives a payment at the end of each period when the underlying interest rate is above a rate agreed in advance (strike rate).

An Interest Rate Floor is a series of interest rate put options in which the buyer of the option receives a payment at the end of each period when the underlying interest rate is below the strike rate.

An Interest Rate Collar is a derivative contract where a market participant simultaneously purchases an interest rate cap and sells an interest rate floor on the same interest rate for the same maturity and notional principal amount.

A Reverse Interest Rate Collar is a derivative contract which involves simultaneous purchase of an interest rate floor and sale of an interest rate cap on the same interest rate for the same maturity and notional principal amount.

A **swap** is an agreement made between two parties, to exchange cash flows in the future, according to a prearranged formula. Swaps are, broadly speaking, series of forward contracts.

Interest rate swap is a derivative contract that involves exchange of a stream of agreed interest payments on a 'notional principal' amount during a specified period.

A swaption is an option on swaps. A swaption gives the buyer the right, but not the obligation, to enter into a swap.

Interest Rate Derivatives

Interest rate derivatives are most often used to hedge against interest rate risk, or else to speculate on the direction of future interest rate moves. Interest rate risk exists in an interest-bearing asset, such as a loan or a bond, due to the possibility of a change in the asset's value resulting from the variability of interest rates.

Market Participants in Interest Rate Derivatives Market

- Hedgers face risk associated with the prices of underlying assets and use derivatives to reduce their risk.
- Speculators/Traders try to predict the future movements in prices of underlying assets and based on the view, take positions in derivative contracts.
- Arbitrage is a deal that produces profit by exploiting a price difference in a product in two different markets.

Interest Rate Derivative (IRD) is a financial derivative contract whose value is derived from one or more interest rates, prices of interest rate instruments, or interest rate indices. According to definition, for IRD underlying can be interest rate or it can be interest rate instrument like government securities, treasury bills, corporate bonds and interest rate indices.

OTC versus Exchange-Traded Derivatives

OTC derivatives (OTCD) are privately negotiated and settled contracts between two parties whereas Exchange-traded derivatives (ETD) are screen-based order matching platform and settled contracts with the aid of Exchange (which provides platform for trade execution) and Clearing Corporation (which conducts the settlement). This makes ETD more transparent as compared to OTCD.

Chapter 3: Exchange Traded Interest Rate Futures

Futures markets were innovated to overcome the limitations of forwards. A futures contract is an agreement made through an organized exchange to buy or sell a fixed amount of a commodity or a financial asset on a future date at an agreed price. Simply, futures are standardised forward contracts that are traded on an exchange. The clearing corporation guarantees settlement of trades done on Exchange.

Interest Rate Futures (IRF) are standardized interest rate derivative contracts traded on a recognized stock exchange to buy or sell a notional security or any other interest-bearing instrument or an index of such instruments or interest rates at a specified future date, at a price determined at the time of the contract. Interest Rate Futures include money market futures also.

Futures Terminologies

Underlying Asset: The value of the future contract is derived from value/price of certain underlying asset.

Spot price/rate: The price/interest rate at which the underlying asset trades in the spot market.

Futures price/rate: The current price /rate of the specified futures contract

Contract Cycle: It is a period over which a contract trade.

Expiry date: Also called last trading day of contract. It is the day on which trading ceases in the contract.

Tick Size: It is minimum move allowed in the price/rate quotations.

Contract Size / Lot Size: Futures contracts are traded in lots. Contract size specifies the amount of asset that has to be delivered for a single contract.

Contract Value: To arrive at contract value, we have to multiply the price/rate with contract multiplier or lot size or contract size.

Trading Hours: Time during which trading is allowed on Exchange trading platform.

Base Price: Base price generally acts as reference price for trading for start of the day.

Price Band: The price range (maximum and minimum price) for the day within which contract can be traded for that day.

Mark to Market (MTM): The positions in the futures contracts for each member are marked-to-market to the daily settlement price of the futures contracts at the end of each trade day.

Final Settlement: Final settlement can be cash settled or physical settled. In case of cash settlement only the profit and loss resulting from positions shall be paid / received from the participants.

Open Interest: An open interest is the total number of contracts outstanding (yet to be settled) for an underlying asset.

Comparison of FRAs and Interest Rate Futures

Operational Mechanism	Bilateral – Over the Counter	Through Centralized trading exchanges
Terms of Contracts	Non-Standardized	Standardized Contract
Underlying	Usually Interest Rate	Interest Rate, Index
Price Discovery	Not efficient, through negotiation	Through free interaction of buyers and sellers
Liquidation Profile	Low	High
Advantages	<ul style="list-style-type: none"> • Since customized product can provide perfect hedge. • Less operation issues related to margin and mark to market settlement 	<ul style="list-style-type: none"> • Price transparency • Elimination of Counterparty credit risk as settlement guarantee by clearing corporation of Exchanges • Access to all types of market participants • Credit Agnostic • Lower liquidity risk compared to OTC • Generally lower impact cost
Limitations	<ul style="list-style-type: none"> • Liquidity risk • Counter party risk • Not accessible for all kind of market participants 	<ul style="list-style-type: none"> • May lead to imperfect hedge as amount and settlement dates are standardized. • Operational issues related to mark-to-mark settlement and margin

A **forward rate** is an interest rate applicable to a financial transaction that will take place in the future. Forward Rate can be determined using spot rate. In an efficient market, the same returns are received for investment made over one long term or multiple shorter terms by reinvesting the maturity proceeds.

Financing cost is the relationship between futures prices and spot prices. It measures the interest that is paid to “finance” or ‘carry’ the asset till expiry date of contract.

In case of fixed income securities, income is accrued on daily basis. Such accrued interest expected to be received on expiry + Coupon payment received in between the contact + interest received on investment of such coupon payment will be considered as **income on cash position**.

$$\text{The future bond price} = \text{Cash Price} + \text{financing cost} - \text{income on cash position}$$

Chapter 4: Exchange Traded Interest Rate Options

Forward/futures contract is a commitment to buy/sell the underlying and has a linear pay off, which indicates unlimited losses and profits. Some market participants desired to ride upside and restrict the losses. Accordingly, options emerged as a financial instrument, which restricted the losses with a provision of unlimited profits on buy or sell of underlying asset. An Option is a contract that gives the option buyer right, but not an obligation, to buy or sell the underlying asset on or before a specified date/day, at a pre-determined price. For acquiring right option buyer pay certain price/premium to option seller.

The right to buy the asset is called **call option** and the right to sell the asset is called **put option**.

The pre-specified price at which the underlying asset may be purchased or sold by the option holder is called as **strike price**.

The date at which the option contract will expire / or ceases to exist is called **expiration date**.

The difference between the date of entering into the contract and the expiration date is called **time to maturity**.

The party which buys the rights but not obligation and pays premium for buying the right is called as **option buyer** and the party which sells the right and receives premium for assuming such obligation is called **option seller/ writer**.

The price which option buyer pays to option seller to acquire the right is called as **option price or option premium**.

In options trading, "**to exercise**" means to put into effect the right to buy or sell the underlying security that is specified in the options contract. If the holder of a call option exercises the contract, they will buy the underlying security at a stated price within a specific timeframe. If the holder of a put option exercises the contract, they will sell the underlying security at a stated price within a specific timeframe

European options: European options can be exercised by the buyer of the option only on the expiration date. Hence, option buyer enjoys less flexibility in how they handle option trading.

American options: American options can be exercised by the buyer any time on or before the expiration date. American option offers more flexibility to option buyer as they can be exercised on any trading day prior to their expiration.

Moneyness of an option

In the money (ITM) option: An option is said to be in the money, if on exercising it, the option buyer gets a positive cash flow

Out of the money (OTM) option: An option is said to be out of the money, if on exercising it, the option buyer gets a negative cash flow.

At the money (ATM) option: An option is said to be at the money if spot price is equal to the strike price. On exercise of ATM option buyer gets zero cash flows.

Basics of Option Pricing and Option Greeks

The option value/option premium can be broken in two parts:

Intrinsic value: Option premium, defined in earlier section, consists of two components – intrinsic value and time value. For an option, intrinsic value refers to the amount by which option is in the money.

Time value: The difference between option premium and intrinsic value is the time value of that Option. ATM and OTM option will have only time value because the intrinsic value of such option is zero. The time value is directly proportional to the length of time to expiration date of the option. Longer the time to expiration, higher is time value. Therefore, everything else remaining the same, call option for two months maturity would be priced higher than the call option at the same strike price for one month maturity.

There are five fundamental parameters on which the option price depends:

Spot price of the underlying asset: The option premium is affected by the price movements in the underlying instrument. If price of the underlying asset goes up, the value of the call option increases, while the value of the put option decreases. Similarly, if the price of the underlying asset falls, the value of the call option decreases, while the value of the put option increases.

Strike Price: If all the other factors remain constant but the strike price of option increases, intrinsic value of the call option will decrease and hence its value will also decrease. On the other hand, with all the other factors remaining constant, increase in strike price of option increases the intrinsic value of the put option which in turn increases its option value.

Volatility: It is the magnitude of movement in the underlying asset's price, either up or down. It affects both call and put options in the same way. Higher the volatility of the underlying stock, higher the premium because there is a greater possibility that the option will move in-the-money during the life of the contract.

Time to expiration: The effect of time to expiration on both call and put options is similar to that of volatility on option premiums. Generally, longer the maturity of the option greater is the uncertainty and hence the higher premiums. The time value portion of an option's premium will decrease with the passage of time. This is also known as time decay.

Interest Rates: The interest rate referred to in relation to the prices of options is what is known as the "Risk Free Interest Rate". Interest rates are slightly complicated because they affect different options, differently. In simpler way high interest rates will result in an increase in the value of a call option and a decrease in the value of a put option.

Option Greeks

Delta measures the sensitivity of the option value to a given small change in the price of the underlying asset.

Gamma measures change in delta with respect to change in price of the underlying asset. This is called a second derivative option with regard to price of the underlying asset.

Theta is a measure of an option's sensitivity to time decay. Theta is the change in option price given a one-day decrease in time to expiration. It is a measure of time decay. Theta is generally used to gain an idea of how time decay is affecting your option positions.

Vega is a measure of the sensitivity of an option price to changes in market volatility. It is the change of an option premium for a given change in the underlying volatility.

Rho is the change in option price given a one percentage point change in the risk-free interest rate. Rho measures the change in an option's price per unit increase in the cost of funding the underlying.

Put-Call Parity

Put-call parity shows the relationship that has to exist between European put and call options that have the same underlying asset, expiration, and strike prices. Put-Call parity holds only for a European option.

$$C + PV(x) = P + S$$

Option pricing methodology

There are various option pricing models which traders use to arrive at the right value of the option:

The Binomial Pricing Model: The binomial model represents the price evolution of the option's underlying asset as the binomial tree of all possible prices at equally-spaced time steps from today under the assumption that at each step, the price can only move up and down at fixed rates and with respective simulated probabilities.

The Black & Scholes Model: It is one of the most popular, relatively simple and fast modes of calculation. Unlike the binomial model, it does not rely on calculation by iteration. This model is used to calculate a theoretical call price (ignoring the dividends paid during the life of the option).

Call and Put option price can be calculated as:

$$C = SN(d_1) - Xe^{-rt}N(d_2)$$

$$P = Xe^{-rt}N(-d_2) - SN(-d_1)$$

Where, $d_1 = [\ln(S/X) + (r + v^2/2)t] / (v\sqrt{t})$

$$d_2 = d_1 - v\sqrt{t}$$

And the variables are:

- S = stock price
- X = strike price
- t = time remaining until expiration, expressed in years
- r = current continuously compounded risk-free interest rate
- v = annual volatility of stock price (the standard deviation of the short-term returns over one year)
- ln = natural logarithm
- N(x) = standard normal cumulative distribution function
- e = the exponential function

Implied Volatility (IV)

Historical Volatility, in the financial market world, we take the past closing prices of the stock/index/bonds/currency rate and calculate the historical volatility. Historical volatility is very easy to calculate and helps us with most of the day-to-day requirements.

Forecasted Volatility refers to the act of predicting the volatility over the desired time frame. There are a few good statistical models available to forecast volatility.

Implied Volatility (IV) represents the market participant's expectation on volatility. Implied volatility can be thought of as consensus volatility arrived amongst all the market participants with respect to the expected amount of underlying price fluctuation over the remaining life of an option.

Pay off Diagrams for Options

Readers are requested to go through the pay-off diagrams given in the NISM book for this part to get a better understanding.

Chapter 5: Strategies Using Exchange Traded Interest Rate Derivatives

Market participants

Hedgers are traders who wish to protect themselves from the risk involved in price movements of underlying i.e., interest rate or interest rate instruments. These types of participants have a real exposure to interest rate risk on account of their underlying business and their objective is to remove the interest rate risk using Exchange Traded Interest Rate Derivatives.

Speculators are a set of market participants does not have a real exposure to interest rate risk. These participants assume interest rate risk by taking a view on the market direction and hope to make returns by taking the price risk.

Arbitragers continuously hunt for the profit opportunities across the markets and products and seize those by executing trades in different markets and products simultaneously. Importantly, arbitragers generally lock in their profits unlike traders who trade naked contracts. This set of market participants identify mispricing in the market and use it for making profit.

Hedging through Exchange Traded Interest Rate Derivatives

For hedging and/or trading, we must decide three parameters: (1) instrument; (2) market size; and (3) Contract Month.

Portfolio Based Hedging: A duration-based hedge ratio is a hedge ratio constructed when interest rate futures contracts are used to hedge positions in an interest-dependent asset, usually bonds money market securities. To reduce interest rate risk in a debt portfolio, investor may hedge the portfolio or part of the portfolio (including one or more securities) on weighted average modified duration basis by using Interest Rate Futures (IRFs).

$$\frac{(\text{Portfolio Modified Duration} * \text{Market Value of the Portfolio})}{(\text{Futures Modified Duration} * \text{Futures Price / PAR})}$$

The above ratio can be used to make the duration of the entire position zero.

Option Trading Strategies

Option Spreads: Spreads involve combining options on the same underlying and of same type (call/ put) but with different strikes and maturities. These are limited profit and limited loss positions. They are primarily categorized into three sections as:

- Vertical Spreads
- Horizontal Spreads
- Diagonal Spreads

Vertical Spreads

Vertical spreads are created by using options having same expiry but different strike prices. Further, these can be created either using calls as combination or puts as combination. These can be further classified as:

- Bullish Vertical Spread using Calls or Using Puts: A bull spread is created when the underlying view on the market is positive, but the trader would also like to reduce his cost on position.

- Bearish Vertical Spread using Calls or Using Puts: This is taken when there is a Bearish view.

Horizontal Spread

Horizontal spread involves same strike, same type but different expiry options. This is also known as time spread or calendar spread. Here, it is not possible to draw the payoff chart as the expiries underlying the spread are different.

Diagonal Spread

Diagonal spread involves combination of options having same underlying but different expiries as well as different strikes. Again, as the two legs in a spread are in different maturities, it is not possible to draw pay offs here as well. These are much more complicated in nature and in execution.

Straddle

- Long Straddle: If a person buys both a call and a put at same strike price, then his max loss will be equal to the sum of these two premiums paid and, price movement from here (in either direction) would first result in that person recovering his premium and then making profit.
- Short Straddle: Here, trader's view is that the price of underlying would not move much or remain stable (i.e., not much movement in interest rate/yield of bond). So, he sells a call and a put so that he can profit from the premiums.

Strangle

- Long Strangle: The outlook here (for the long strangle position) is that the market will move substantially in either direction, but while in straddle, both options have same strike price, in case of a strangle, the strikes are different.
- Short Strangle This is exactly opposite to the long strangle. Outlook, like short straddle, is that market will remain stable over the life of options.

Covered Call

Writing covered calls is a strategy that sells volatility in return of fees. This strategy is used to generate extra income from existing holdings in the bonds.

Protective Put

A fund manager, who is anticipating a fall, can either sell his entire portfolio or short futures to hedge his portfolio. In both cases, he is out of the market, as far as profits from upside are concerned. A protective put helps limit downside losses while keeping the upside by paying a small cost.

Butterfly Spread

A butterfly spread is an options strategy that combines both bull and bear spreads. These are neutral strategies that come with a fixed risk and capped profits and losses. Long Call Butterfly: Long Call Butterfly is a neutral strategy where very low volatility in the price of underlying is expected.

Chapter 6: Trading Mechanism in Exchange Traded Interest Rate Derivatives

List of Entities in the Trading System

Stock Exchange is incorporated for the purpose of assisting, regulating or coordinating the business of buying, selling or dealing in securities. Its important role is to establish a nation-wide trading facility for various financial instruments.

Clearing Corporation does clearing, settlement and risk management for trades executed on Exchanges.

A trading member is allowed to execute trades on his own account as well as on account of his clients.

Clearing Members have clearing and settlement rights in any recognised clearing corporation. Clearing Member helps in clearing of the trades of their clients. Clearing Members have clearing and settlement rights in any recognised clearing corporation. Clearing Member helps in clearing of the trades of their clients.

Investors/clients trade in Exchange Traded Interest Rate Derivatives (ETIRD) through trading member of the currency derivatives segment. Trading member will accept order on behalf of client and sends the same to the Exchange.

SEBI registered Stock Brokers to access Negotiated Dealing System-Order Matching (NDS-OM)

In order to facilitate SEBI-registered stock brokers to participate in Government Securities (G-Secs) market in the NDS-OM, it has been decided that they may do so under a Separate Business Unit (SBU) of the stock broking entity itself, in the manner specified herewith.

Exchange Trading System

All the derivatives exchanges in India provide a fully automated screen-based trading platform for ETIRD as part of currency derivatives segment. These trading systems support an order driven market and simultaneously provide complete transparency of trading operations. Exchange trading system is a fully computerized system designed to offer investors across the length and breadth of the country a safe and easy way to invest which adopts the principle of an order driven market.

The **trader workstation (TWS)** is the terminal from which the member accesses the trading system. Exchange provides own trading platforms to its member. Each trader has a unique identification by way of Trading Member ID and User ID through which they are able to log on to the system for trading or inquiry purposes.

Placing of Order: The Broker accepts orders from the client and sends the same to the Exchange after performing the risk management checks. Clients have the option of placing their orders directly through various channels, provided by members, like internet, phone, direct market access (DMA) (for institutional clients), securities trading using wireless technology facility (STWT) / Automated / Algorithm Trading (ALGO) / Smart order router (SOR), etc

Order Book refers to an electronic list of buy and sell orders which are available for matching (not yet converted in trade or outstanding order) for a specific security or derivatives contract organized by price level. An order book lists the number of shares/lot being bid on or offered at each price point, or market depth. It also provides number of orders at each price level.

Exchanges provide **spread order book** separately for taking calendar spread combination. A calendar spread is a contract where you buy/sell a particular month contract (Futures or Options) and sell/buy (take an opposite position) of the same contract of a different month.

Order management consists of entering orders, order modification, order cancellation and order matching. The main components of an order are:

- Price
- Time
- Quantity / No. of Contract
- Security/Contract (What to buy and what to sell))
- Action (Buy / Sell)
- Client identity (UCC) and Proprietary / Client identifier.

Types of orders

Price Condition

- Market Order – Basic Trade: A market order is where a trader purchases or sells their contracts at the best market price available across the market depth to complete the order quantity/lot. In the market order there is no need to specify the price at which a trader wants to purchase or sell.
- Limit Order: Limit orders involve setting the entry or exit price and then aiming to buy at or below the market price or sell at or above it. Unlike market order, the trader here needs to specify price.
- Stop Orders: (orders with stop loss triggers) The one that allows the Trading Member to place an order which gets activated only when the market price of the relevant security reaches or crosses a threshold price. Until then the order does not enter the market.

Time Condition

- DAY - 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 matched during the day, the order gets cancelled automatically at the end of the trading day.
- IOC - An Immediate or Cancel (IOC) order allows a Trading Member to buy or sell a security as soon as the order is released into the market, failing which the order will be removed from the market.
- GTC - A Good Till Cancelled (GTC) order is an order that remains in the system until it is cancelled by the Trading Member. It will therefore be able to span trading days if it does not get matched.
- GTD - A Good Till Days/Date (GTD) order allows the trading member to specify the days/date up to which the order should stay in the system. At the end of this period the order will get flushed from the system
- Cancel on Logout (COL): If member / user entered order with COL, all outstanding order of the user will get cancelled once user logs out from the TWS.

Quantity Condition

- DQ - Disclosed Quantity (DQ) - An order with a DQ condition allows the Trading Member to disclose only a part of the order quantity/lot to the market.
- MF - Minimum Fill (MF) orders allow the Trading Member to specify the minimum quantity by which an order should be filled.
- AON - All or None orders allow a Trading Member to impose the condition that only the full order should be matched against. This may be by way of multiple trades. If the full order is not matched it will stay in the books till matched or cancelled.

Proprietary Trading

Trading members are also allowed to trade on own behalf. To facilitate the same Stock Exchanges, provide facility of placing order on proprietary (pro) account. Facility of placing orders on proprietary account through trading terminals shall be extended only at one location of the members as specified / required by the members. Trading terminals located at places other than the above location shall have a facility to place orders only for and on behalf of a client by entering client code details as required / specified by the Exchange / SEBI.

Types of Risk for Members

Operational risk is the risk of monetary loss resulting from inadequate or failed internal processes, manual and systems error or external events.

Market risk refers to the possibility of incurring large losses from adverse changes in financial asset prices such as stock prices.

Credit risk is the risk of default on a debt that may arise from a borrower failing to make required payments.

Legal risk arises from the possibility that an entity may not be able to enforce a contract against another party.

Systemic Risk refers to (1) the scenario that a disruption at a firm, in a market segment, or to a settlement system could cause a “domino effect” throughout the financial markets toppling one financial institution after another or (2) a “crisis of confidence” among investors, creating illiquid conditions in the marketplace.

Pre-Order and Pre-Trade Checks

There are various pre-order (checks which are applicable before order entering into the trading system) and Pre-trade (checks which are applicable before execution of trade) checks which are available on TWS and trading system of the Exchange.

Pre-order checks:

- Price Range Check
- Quantity Freeze
- Single Order Quantity
- User order value limits
- Cumulative open order value checks
- UCC/PAN Check

Pre-trade checks

- Trade Execution Range
- Self-Trade Check
- Market price protection
- Kill Switch
- Cancel on Logout (COL)

Trading Costs

While trading in Exchange Traded Interest Rate Derivatives (ETIRD) on behalf of client, a trading member should specify various charges, including brokerage, payable by the client to avoid any disputes at a later date. Following levies / brokerage can be charged to client:

- Statutory Levies
- Regulatory Levies/Charges
- Brokerage
- SEBI Turnover Fees
- Stamp Duty

Chapter 7: Clearing, Settlement and Risk Management in Exchange Traded Interest Rate Derivatives

Clearing and Settlement Mechanism

The clearing mechanism essentially involves working out open positions and obligations of clearing members. This position is considered for exposure and daily margin purposes. The open positions of clearing members are arrived at by aggregating the open positions of all the brokers/trading members and all custodial participants clearing through them.

Important Terminologies pertaining to clearing corporations

- **Pay-In** is a process whereby a Clearing Member brings in money and/or securities to the Clearing House/ Corporation. This forms the first phase of the settlement activity.
- **Pay-Out** is a process where the Clearing House/ Corporation pays money or delivers securities to the Clearing Member. This is the second phase of the settlement activity

Clearing Corporation

The clearing corporation determines fund/security obligations and arranges for pay-in of the same. It collects and maintains margins, processes for shortages in funds and securities. For carrying out settlement of trades, the clearing corporation is helped by the clearing members, clearing banks, custodians and depositories. Thus, these entities are also important intermediaries of securities market.

Clearing Members

- Trading cum Self-clearing member
- Trading member-cum-clearing member
- Professional clearing member

Clearing Bank(s) acts as an important intermediary between a clearing member(s) and the clearing corporation. Every clearing member needs to maintain an account 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. It is the function of the clearing members to ensure that the funds are available in his account with clearing bank on the day of funds pay-in to meet the funds obligations.

A **Depository** is an entity facilitating holding of securities in electronic form and enables transfer of securities by book entry. The main objective of depository is to provide maintenance of ownership or transfer records of securities in an electronic book entry form resulting in paper-less trading rather than paper-based trading and to ensure transferability of securities with speed, accuracy and safety.

The **clearing mechanism** essentially involves working out open positions and obligations of 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 TMs and all custodial participants clearing through him.

Settlement Obligation

Clearing Corporation receives the details of trades and prices from the Exchange. Settlement obligations are computed using predefined methodology specified for the segment/product. The obligations are generated and downloaded to trading and clearing member at end of day. Some of the methods of determining obligations are listed below:

- Daily mark to market settlement of futures contract
- Final settlement for futures contract which are cash settled
- Premium settlement for option contracts
- Exercise settlement for cash settled option contracts
- Netted obligation
- Delivery Settlement

Settlement

Settlement follows clearing and consists of receipt and payment of cash and/or delivery of securities (in case of physical settlement) after multilateral netting in the clearing. Physical settlement means exchange of cash for the security. Physical settlement does not mean that every sell trade during contract's life results in physical delivery. The seller can always close ("square up") his position with an offsetting buy trade, but it must be done before the close of business on the last trading day. In case of physical delivery, the open position at the close on last trading day must be settled with physical delivery of any of the deliverable securities.

Daily Mark to Market (MTM) settlement of futures contract: Daily settlement prices will be computed for interest rate futures contracts based on methodology specified in above table. All positions of a clearing member in interest rate futures contracts, at the close of trading hours on a day, shall be marked to market at the daily settlement price (for daily mark to market settlement) and settled in cash. The settlement is done by debit/ credit of the clearing accounts of clearing members with the respective clearing bank on T+1 as per timeline specified by clearing corporation. All open positions will be carried forward at the latest daily settlement prices.

Premium settlement for option contracts: Premium settlement in respect of admitted deals in interest rate options contracts shall be cash settled by debit/ credit of the clearing accounts of clearing members with the respective clearing bank on T+1 as per timeline specified by clearing corporation. The premium payable or receivable value of clearing members shall be computed after netting the premium payable or receivable positions at trading member/Custodial Participant level, for each option contract, at the end of each trading day. Wherein, premium variation in interest rate options position will be adjusted against the collateral placed and not cash settled.

Margins and action on deliverable positions:

- i) **Margins on physical delivery positions:** For positions marked for delivery, a margin equal to VaR of the futures on the invoice price plus 5% of face value along with mark to market adjustments shall be charged both to the buying client and selling client. The margins shall be levied from the intention day and shall be released on the completion of the settlement.
- ii) **Margins from last trading day to last intention day:** For positions from last trading date till date of intention in cases where no intention is provided, a margin amount equal to VaR of the futures on the invoice price of the costliest security from the deliverable basket plus 5% of face value along with mark to market adjustments based on the underlying closing prices of the costliest security from the deliverable basket shall be charged on both buying client and selling client. The margins shall be levied from the last trading day till the day of receipt of intention to deliver.
- iii) **Action in case no intent to deliver is provided:** In case no intent is provided by the selling CM till two business days prior to the last delivery date, it shall be presumed that selling CM has failed to deliver the security and the auction mechanism, as specified for security shortages, shall be activated. The auction shall take place one business day prior to the last delivery date.

Initial margin is payable on all open positions of clearing members, up to client level and shall be payable upfront by Clearing Members in accordance with the margin computation mechanism adopted by the Clearing Corporation. Initial margin shall include SPAN margins, Margin on consolidated crystallized obligation, delivery margins and such other additional margins that may be specified by the clearing corporation from time to time.

Net Option Value is computed as the difference between the long option positions and the short option positions, valued at the last available closing price of the option contract and shall be updated intraday at the current market value of the relevant option contracts at the time of generation of risk parameters. The Net Option Value shall be added to the Liquid Net Worth of the clearing member.

Additional Margin: Exchanges / Clearing Corporations have the right to impose additional risk containment measures over and above the risk containment system mandated by SEBI. This shall be in addition to the initial margin and extreme loss margin, which are or may have been imposed from time to time.

Core Settlement Guarantee Fund

The corpus of the fund should be adequate to meet all the contingencies arising on account of failure of any member(s). The risk or liability to the fund depends on various factors such as trade volume, delivery percentage, maximum settlement liability of the members, the history of defaults, capital adequacy of the members, the degree of safety measures employed by the CC/SE, etc. A Minimum Required Corpus (MRC) of the core SGF should be created. In the event of usage of Core SGF during a calendar month, contributors shall, as per usage of their individual contribution, immediately replenish the Core SGF to MRC. However, such contribution towards replenishment of Core SGF by the members would be restricted to only once during a period of 30 calendar days regardless of the number of defaults during the period.

Stress testing and back testing

Stress test for credit risk: CC shall carry out daily stress testing for credit risk using at least the standardized stress testing methodology prescribed for each segment viz. equity, equity derivatives and currency derivatives. Apart from the stress scenarios prescribed for cash market and derivatives market segments, CCs shall also develop own scenarios for a variety of 'extreme but plausible market conditions' (in terms of both defaulters' positions and

possible price changes in liquidation periods, including the risk that liquidating such positions could have an impact on the market) and carry out stress testing using self-developed scenarios.

Liquidity stress test and adequacy of liquidity arrangements: CC shall ensure that it maintains sufficient liquid resources to manage liquidity risks from members, settlement banks and those generated by its investment policy.

Reverse stress test: CC shall periodically carry out reverse stress tests designed to identify under which market conditions and under what scenarios the combination of its margins, Core SGF and other financial resources prove insufficient to meet its obligations.

Chapter 8: Regulatory Framework for Exchange Traded Interest Rate Derivatives

Similar to currency derivatives, exchange traded interest rate derivatives are jointly regulated by Reserve Bank of India (RBI) and Securities and Exchange Board of India (SEBI). Within the statutory regulations of RBI and SEBI, the Exchanges and Clearing Corporations will frame the operational rules and procedures under their bye-laws for Exchange traded interest rate derivatives

Securities Contracts (Regulation) Act, 1956 [SC(R)A]

It provides for direct and indirect control of virtually all aspects of securities trading and the running of Stock Exchanges and aims to preventing undesirable transactions in securities.

RBI-SEBI Standing Technical Committee on Exchange Traded Currency and Interest Rate Derivatives

With a view to enable entities to manage volatility in the currency market, RBI issued comprehensive guidelines on the usage of foreign currency forwards, swaps and options in the OTC market. At the same time, RBI also set up an Internal working group to explore the advantages of introducing currency futures. The Report of the Internal Working Group of RBI submitted in April 2008, recommended the introduction of exchange traded currency futures. It was decided in a joint meeting of RBI and SEBI on February 28, 2008, that an RBI-SEBI Standing Technical Committee on Exchange Traded Currency and Interest Rate Derivatives would be constituted.

RBI guideline on Exchange Traded Interest Rate Derivatives

RBI and SEBI have come out with various directions, notifications, circulars with regards to product design for Exchange Traded Interest Rate Derivatives (ETIRD).

- **Interest Rate Derivative (IRD)** is a financial derivative contract whose value is derived from one or more interest rates, prices of interest rate instruments, or interest rate indices.
- **Interest Rate Futures (IRF)** are standardized interest rate derivative contracts traded on a recognized stock exchange to buy or sell a notional security or any other interestbearing instrument or an index of such instruments or interest rates at a specified future date, at a price determined at the time of the contract. Interest Rate Futures include Money Market Futures.
- **Interest Rate Option (IRO)** is an option contract whose value is based on Rupee interest rates or interest rate instruments.

Other points defined include:

- Eligible Participants
- Trading Venues
- Interest Rate Derivatives on Recognized Stock Exchanges
- Transactions by non-residents for the purpose of hedging interest rate risk
- Transactions by non-residents for purposes other than hedging interest rate risk
- Conditions applicable to IRDs on both exchanges and in the OTC market

Regulatory guideline on participation of various entities in ETIRD

Banks & Primary Dealers: Banks are permitted to participate in IRD both for the purpose of hedging the risk in the underlying investment portfolio and also to take trading position. However, banks are not allowed to undertake transactions in IRFs on behalf of clients. All derivative contracts shall be subject to the Suitability and Appropriateness policy prescribed.

Mutual Funds: Mutual funds are allowed to participate in ETIRD. SEBI has provided guideline for mutual funds participation in derivatives and specific to ETIRD.

Insurance Companies: IRDAI has provided guideline for insurance companies' participation in Interest Rate Futures only. According to the guideline, insurance companies are allowed to participate in IRF only and it is only for long hedge.

Foreign Portfolio Investors: A non-resident may undertake Rupee interest rate derivatives transactions in India for following purpose to hedge an exposure to Rupee interest rate risk as stipulated by RBI or purposes other than hedging, to the extent stipulated by RBI.

NBFCs: Applicable NBFCs can participate in the designated interest rate futures (IRF) exchanges recognized by SEBI as clients, for the purpose of hedging their underlying exposures. All non-deposit taking applicable NBFCs with asset size of ₹ 1000 crore and above may also participate in the interest rate futures market permitted on recognized stock exchanges as trading members, subject to RBI/ SEBI guidelines.

Role of FIMMDA in Fixed Income and Derivatives Markets in India

The Fixed Income Money Market and Derivatives Association of India (FIMMDA) is an association of Scheduled Commercial Banks, Financial Institutions, Primary Dealers and Insurance Companies. FIMMDA is a voluntary market body for the bond, money and derivatives markets. FIMMDA has members representing all major institutional segments of the market. The membership includes Nationalized Banks, Private sector banks, Foreign Banks, Financial institutions, Insurance Companies and all Primary Dealers.

Chapter 9: Accounting and Taxation

Accounting Guideline and Disclosure Requirements

RBI Rupee Interest Rate Derivatives (Reserve Bank) Directions, 2019 has specified that for OTC and Exchange traded interest rate derivatives “Accounting, valuation and capital requirement shall be as per the applicable accounting standards and valuation methods prescribed by ICAI or other standard setting organization or as specified by the respective regulators of participants”.

ICAI Guidance Notes on Accounting for Derivatives Contract (Revised 2021): The Institute of Chartered Accountants of India (ICAI) has issued guidance notes on Accounting for Derivatives Contract (Revised 2021). Scope of the note specified that entities such as banking, non-banking finance companies ('NBFCs'), housing finance companies and insurance entities are required to follow the accounting treatment for derivative contracts, if any, prescribed by the concerned regulators such as the Reserve Bank of India (RBI) in case of banking entities and the NBFCs, National Housing Bank (NHB) in case of housing finance companies and Insurance Regulatory and Development Authority of India (IRDAI) in case of insurance entities.

Recognition of derivatives on the balance sheet at fair value: This Guidance Note requires that all derivatives are recognised on the balance sheet and measured at fair value since a derivative contract represents a contractual right or an obligation.

Hedge Accounting: An entity is permitted but not required to designate a derivatives contract as a hedging instrument. Where it designates a derivative contract as a hedging instrument, it needs to, as a minimum comply with the specified conditions.

Types of hedge accounting:

This Guidance Note recognises the following three types of hedging:

- The fair value hedge accounting model is applied when hedging the risk of a fair value change of assets and liabilities already recognised in the balance sheet, or a firm commitment that is not yet recognised.
- The cash flow hedge accounting model is applied when hedging the risk of changes in highly probable future cash flows or a firm commitment in a foreign currency.
- The hedge of a net investment in a foreign operation.

Presentation in the financial statements

- Derivative assets and liabilities recognised on the balance sheet at fair value should be presented as current and non-current based on the following considerations:
- Derivatives that are intended for trading or speculative purposes should be reflected as current assets and liabilities.
- Derivatives that are hedges of recognised assets or liabilities should be classified as current or non-current based on the classification of the hedged item.
- Derivatives that are hedges of forecasted transactions and firm commitments should be classified as current or non-current based on the settlement date / maturity dates of the derivative contracts.
- Derivatives that have periodic or multiple settlements such as interest rate swaps should not be bifurcate into current and non-current elements. Their classification should be based on when a predominant portion of their cash flows are due for settlement as per their contractual terms.

Computation of Turnover

The Income-tax Act does not contain any provision or guidance for computation of turnover in Exchange traded derivatives trading. However, the Guidance Note on Tax Audit issued by the ICAI prescribes the method of determining turnover which shall be as under:

- a) The total of favourable and unfavourable differences is taken as turnover.
- b) Premium received on sale of options is also to be included in turnover. However, where the premium received is included for determining net profit for transactions, the same should not be separately included.
- c) In respect of any reverse trades, the difference thereon should also form part of the turnover.

Chapter 10: Code of Conduct and Investor Protection Measure

SEBI's Code of Conduct to Brokers

Schedule II of the SEBI (Stock Brokers) Regulations, 1992 prescribes a code of conduct for securities brokers.

It Includes:

- General Duties: Integrity, Exercise of Due Skill and Care, Manipulation, Malpractices, Compliance with Statutory Requirements.
- Duty towards the Investor
- Duty towards other stock-brokers

Investor Grievance Redressal Mechanism

Investors are the backbone of the securities market. Protection of the interests of investors is of paramount importance for the intermediaries, stock exchanges and the regulators associated with the markets. Regulations and compliance efforts have been put in place to protect the investors against any intentional or unintentional wrong doing or activities of any of the participants in the market. The various stages of the same are as follows:

1. Investor Grievance Handling at the Trading Member Level
2. Investor Grievance handling at the Stock Exchanges and SEBI

SEBI Complaints Redressal System (SCORES) SEBI handles the investor grievances through a system called SEBI Complaints Redress System (SCORES). SCORES is a web based centralized system to capture investor complaints against listed companies and registered intermediaries and is available 24x7. It allows the investors to lodge their complaints and track the status online. The system also allows market intermediaries and listed companies to receive complaints lodged against them electronically. SEBI encourages the investors to lodge complaints through electronic mode in SCORES.

Online Resolution of Disputes in the Indian Securities Market

Investors and Listed Companies/Specified Intermediaries/Regulated entities under the ambit of ODR Disputes between Investors/Clients and listed companies (including their registrar and share transfer agents) or any of the specified intermediaries / regulated entities in securities market arising out of latter's activities in the securities market, will be resolved in accordance with this circular and by harnessing online conciliation and/or online arbitration as specified in the SEBI circular on ODR.

Introduction of the common Online Dispute Resolution Portal: The MIIs shall, in consultation with their empanelled ODR Institutions, establish and operate a common Online Dispute Resolution Portal ("ODR Portal"). The MIIs will make joint efforts to develop and operationalize the ODR Platform. For the purposes of implementation of this circular, the MIIs shall enter into an agreement amongst themselves, which will, inter alia, outline the nature of their responsibilities, the cost of development, operating, upgradation, maintenance (including security of data of investors and intermediaries as specified by the Board from time to time) and for inspection and/or audit of the ODR Platform. The SEBI may, from time to time, undertake inspection in order to ensure proper functioning of ODR Portal and MIIs shall provide complete cooperation to the SEBI in this regard.

PLEASE NOTE, THESE ARE SHORT IMPORTANT NOTES EXTRACTED FROM THE NISM BOOK. ITS ADVISABLE TO READ THE NISM BOOK TO GET FULL KNOWLEDGE.

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