NISM CERTIFICATION EXAMINATION WORK BOOK

IV

Interest Rate Derivatives



National Institute of Securities Markets
A Capacity Building Initiative of SEBI

Workbook for
NISM-Series-IV:
Interest Rate Derivatives
Certification Examination

National Institute of Securities Markets
A Capacity Building Initiative of SEBI

National Institute of Securities Markets
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This workbook has been developed to assist candidates in preparing for the National Institute of Securities Markets (NISM) NISM-Series-IV: Interest Rate Derivatives Certification Examination.

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Mr. Sashi Krishnan
Director

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These Certifications create quality market professionals and catalyzes greater investor participation in the markets. They also provide structured career paths to students and job aspirants in the securities markets.

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The examination seeks to create a common minimum knowledge benchmark for the approved users and sales personnel of the trading members who are registered as such in the Currency Derivatives Segment of a recognized stock exchange and trading in Interest Rate Derivatives.

The examination aims to enable a better understanding of various derivatives products available in exchange traded interest rate derivatives markets, risks associated with those products and the trading, clearing and settlement mechanisms of interest rate derivatives. The examination also covers knowledge competencies related to the understanding of regulations governing the interest rate derivatives markets in India.

On successful completion of the examination the candidate should:

- Know the basics of fixed income securities and interest rate derivative products in India.
- Understand the analytical framework of interest rate futures and options traded in Indian exchanges.
- Understand various hedging, trading and arbitrage strategies that can be built using interest rate derivatives.
- Understand clearing, settlement and risk management of interest rate futures and options.
- Know the legal and regulatory environment in which the interest rate derivatives markets operate in India.

Assessment Structure

The NISM-Series-IV: Interest Rate Derivatives Certification Examination (NISM-Series-IV: IRD Examination) will be of 100 marks consisting of 100 questions of 1 mark each and should be completed in 2 hours. There will be negative marking of 25% of the marks assigned to the question for each wrong answer. The passing score for the examination is 60 marks (i.e., 60%).

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- Please note that the Test Centre workstations are equipped with either Microsoft Excel or Open Office Calc. Therefore, candidates are advised to be well versed with both of these softwares for computation of numericals.
- The sample questions and the examples discussed in the workbook are for reference purposes only. The level of difficulty may vary in the actual examination.

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CHAPTER 1: INTRODUCTION TO INTEREST RATE, INTEREST RATE INSTRUMENTS AND FIXED INCOME MARKET

LEARNING OBJECTIVES

After studying this chapter, you should know about:

- Concept of Interest Rate and Risk-Free Interest Rate
- Fixed Income Securities
- Concept of Term Structure of Interest Rate
- Bond Valuation, Yield, Spot Rate, Measures of Bond Risk
- Primary and Secondary Debt Market in India

1.1 Understanding the Interest Rate Concept

Debt is a concept of "I owe You" 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. In simple terms, Mr. A is borrowing some money "X" from Mr. B for 3 months with a promise to pay back "X+Δ". This "Δ" is calculated as a percentage or rate of return on the Principal X. For example, Δ = X * R% *3/12 where "R% is the annual rate of interest agreed to be paid for the use of Principal amount "X" by Mr. A. In this example, Mr. A is the "Borrower", Mr. B is the "Lender" and "R" is the agreed rate of interest expressed as percentage per annum and time period is "3/12" years (i.e., 3 months). To make the process formal and enforceable, Mr. A and Mr. B can sign the agreement and then the same is treated as "Loan". Loans are generally non-tradable. On the other hand, Mr. A can give in writing a "Note" that he would return the borrowed Principal money "X" to Mr. B after 3 months with agreed rate of interest at R% per annum. Simply put, we can state that the "Note" given by Mr. A is treated as a "Debt instrument" or "Debt Securities" which is a tradable security (Mr. B can assign the same to someone against appropriate payment before 3 months, if he requires liquidity and wants to exit the transaction): Mr. A here is the Issuer, Mr. B is the Investor, R is the yield or rate of interest on the date of transaction for the borrowed time (here 3 months).

In the above example "R" is the Interest rate which is essentially a charge to the borrower for the use of an asset. Assets borrowed can include cash, consumer goods, vehicles, property, etc. Interest rates apply to most lending or borrowing transactions. Individuals borrow money to purchase homes, fund projects, launch or fund businesses, or pay for college fees. Businesses take loans to fund capital projects and expand their operations by purchasing fixed and long-term assets such as land, buildings, and machinery. Borrowed money is repaid either in a lump sum by a pre-determined date or in periodic instalments. 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.

Interest rate is subjective. If we say, interest rate is 6%, it does not provide any clarity on the interest rate. To understand let us take few examples:

- The housing loan up to Rs. 50 lacs for 15 years is at the rate of 6% p.a.
- The personal loan up to Rs. 50 lacs for 15 years is at the rate of 7% p.a.
- The housing loan up to Rs. 50 lacs for 20 years is at the rate of 6.5% p.a.
- The housing loan above Rs. 50 lacs for 15 years is at the rate of 6.25% p.a.
- The coupon for government securities with 5-year maturity is 5% p.a.
- The coupon for AAA corporate bonds with 5-year maturity is 5.50% p.a.

For above example you can see that the interest rate changes with change in tenor, amount, credit risk etc., as interest rate will be determined based on various factors.

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 macro factors that influence the interest rates in the economy:

1. Demand for money: This will be best explained by looking at the economic activity in the market. When the economy is doing better, there will be more demand for funds and investors would be willing to take higher risk by investing in various projects. Hence, the demand for funds would see an uptick which will possibly raise the cost of money (interest rate). However, during recession when the effective demand is very low, the demand for funds from investors would be low and interest rate would show a depression.
2. Supply of money: The supply of money is typically controlled by the central bank of the country. When the inflation kicks in, the central bank would like to tighten the supply of money which will reduce effective demand and it would possibly think of increasing policy rate to make the cost of funds higher.
3. Fiscal deficit and government borrowing: When fiscal deficit is high and Government has to borrow higher amount from the market, the traders would demand higher interest rate to support such borrowing and the funds for corporates would be constrained.
4. Inflation: When inflation level increases, the savers need compensation, as the real value of their money would drop, and therefore the nominal interest rate has to be higher to compensate for the same. As inflation drops, the nominal interest rate also comes down.
5. Global interest rates and foreign exchange rates: Global investors would arbitrage between various markets. When interest rates rise in other countries, investors would move to such locations to take advantage of the higher rate of return. Hence, to attract foreign investment and to keep in sync with the global scenario, the domestic interest rate also has to increase.

6. Central bank actions: At times, the central banks raise policy rates which affect all commercial interest rates in the system. A rise in policy Repo rate would lead to increase in money market rates which will affect the bond market yields.

Following are some of the micro factors which will have impact on interest rates of fixed income securities

1. Maturity / Tenor of the bonds: Generally, interest rates are positively correlated with the tenor. As tenor increases interest rates increased.
2. Credit Risk: If there is a higher level of perceived credit risk, investors and lenders usually charge a higher interest rate.
3. Seniority of Bonds: Bond seniority refers to the order in which bondholders are paid in case the issuer defaults or goes bankrupt. Seniority affects the perceived risk of the bond, which directly influences the interest rate.
4. Security of Bonds: Secured bonds are backed by specific assets of the issuer. Unsecured bonds not backed by any specific assets, hence pay higher interest rates to compensate for the higher risk.
5. Liquidity of Bonds: Bond liquidity refers to how easily a bond can be bought or sold in the market without affecting its price significantly. Investors are willing to pay a premium for bonds that are easy to trade.
6. Investor sentiments: Investor sentiment refers to the overall mood or attitude of investors toward market conditions. When sentiments turn negative, investors rush to safer assets like government securities.

1.1.1 Effective Rate

The effective interest rate can be different from annual interest rate due to compounding effect. Let us understand the same with an example. If a debt security pays 6% annually and compounds semi-annually, an investor who places Rs.1,000 in this bond will receive Rs.30 of interest payments after the first 6 months (Rs.1,000 x .03), and Rs.30.90 of interest after the next six months (Rs.1,030 x .03), assuming Rs. 30 received after 6 months is invested in same bond. In total, this investor receives Rs.60.90 for the year. In this scenario, while the nominal rate is 6%, the effective rate is 6.09%.

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

Effective interest rate = [(1+6%/2)^2)-1] = 6.09%

Where n = number of compounding periods.

1.1.2 Nominal and Real Interest Rate

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. However, the inflation reduces the purchasing power of money. Therefore, the nominal interest rate has to be adjusted for the rate of inflation in order to understand the real growth of money for 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:

$(1 + r) \times (1 + i) = (1 + R)$

where r is the real interest rate, i is the inflation rate and R is the nominal interest rate.

For low-level rates, this relation can be approximated as: $r = R - i$

i.e., Real interest rate = Nominal interest rate – Rate of Inflation

For example, if the nominal interest rate on a bond is 9% and the inflation rate is 6%, then the real interest rate will be around 3%. Therefore, if the rate of inflation exceeds the coupon rate of a bond, the real interest rate on the bond will be negative. For example, a bond with a 7% nominal interest rate will have a real interest rate of -2% (approximately), if the rate of inflation is 9%.

In brief:

- The interest rate is the amount charged on top of the principal by a lender to a borrower for the use of assets.
- It is the amount charged, expressed as a percentage of principal, by a lender to a borrower for the use of assets.
- Interest rates are typically noted on an annual basis.
- Interest rate is subjective.
- Interest rate is decided based on various factors.
- Interest rate risk is the uncertainty in the movement of the interest rates.
- Both way movement of interest rate will impact the participants.

1.2 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. Bonds / Debentures are the most common form of fixed income securities. Companies raise capital by issuing fixed income products to investors. A bond is an investment product that is issued by corporations and governments to raise funds to finance projects and fund operations. Bonds are mostly comprised of corporate bonds and government bonds and can have various maturities and face value amounts. They are called "fixed-income" securities because of the following "fixed" features.

- Their life is *fixed*: they will be redeemed on a specified future date because all borrow-lend transactions are for a *fixed* period. The only exception to this rule is a Dutch perpetual bond issued in 1648. In recent years, some Indian banks and corporates have issued perpetual bonds, which are not strictly perpetuals because the issuer has call option.
- In most cases, their cash flows are *fixed*, too. In other words, the timing and size of cash flows are known in advance. In some securities (e.g. floating-rate bonds), the

timing of cash flows is known in advance but not their size because the amount is linked to prevailing interest rate.

1.2.1 Key Components of Fixed Income Securities are given below:

Issue Price is the price at which the bonds are issued to the investors. Issue price is mostly same as face value in case of coupon bearing bond. In case of non-coupon bearing bond (zero coupon bond), security is generally issued at discount i.e., issue price is less than face value.

Face Value (FV) is also known as the par value or principal value. Coupon (interest) is calculated on the face value of bond. FV is the price of the bond, which is agreed by the issuer to pay to the investor, excluding the interest amount, on the maturity date. Sometime issuer can pay premium above the face value at the time of maturity.

Coupon / Interest is the cash flow that are offered by a particular security at fixed intervals / predefined dates. The coupon expressed as a percentage of the face value of the security gives the coupon rate. Coupons are typically given on annual basis.

Coupon Frequency means how regularly an issuer pays the coupon to holder. Bonds generally pay interest monthly, quarterly, semi-annually or annually.

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. From that date, the security ceases to exist.

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. If the redemption proceeds are more than the face value of the bond/debentures, the debentures are redeemed at a premium. If one gets less than the face value, then they are redeemed at a discount and if one gets the same as their face value, then they are redeemed at par.

Example:
Security with FV of Rs 1,000 issued on April 01, 2021, for a period of 10 years at Rs. 1,000, Coupon of 7% p.a. is paid every 6 months.
Issue price = Rs 1,000
Face value = Rs 1,000
Coupon = 7%
Coupon Frequency = Half yearly
Interest payment date: April 01st and October 01st.
Maturity Date = April 01, 2031
Put Option =Not applicable
Call option =Not applicable
Redemption Value = Rs 1,000

1.3 Type of Fixed Income Securities

A bond is a financial security issued by a legal entity to raise funds from the financial market and agrees to refund/return the borrowed amount (principal) at the end of the contract period or at various time intervals as given in the indenture along with the promised interest or coupon. Agreed annual interest promised by the issuer on the bond is generally referred to as "Coupon". A bond is akin to a loan with a maturity and coupon rate paid at various intervals viz. quarterly or half-yearly or annually. However, it differs from a loan mainly with respect to its tradability. A bond is usually tradable and can change many hands before it matures; whereas a loan usually is not traded or transferred freely. A loan brings permanent risk to the lender till the loan is repaid but the bond holder can transfer his risk to other risk takers through efficient pricing mechanism. The value of the loan does not change but the value of the bond changes on continuous basis depending on future interest rate regime in the economy as well as the credit worthiness of the borrower. While bonds can be classified in many ways, for ease of understanding, the basic classification of bonds can be considered based on the following criteria:

- Based on issuers;
- Based on maturity;
- Based on coupon;
- Based on currencies;
- Based on embedded options;
- Based on Security
- Based on priority of claims;
- Based on purpose of issue;
- Based on underlying;
- Based on taxation.

Here we will discuss in brief few important classifications of bonds based on their inherent features.

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

The borrowers of funds who borrowed by way of issuing of bonds are called Issuers. Bonds are usually gauged for their riskiness based on the issuer's profile. The value of the bond mainly depends on the ability of the borrower to service the debt obligations as per the bond indenture.

1.3.1.1 Government Bonds / Sovereign Bonds / Gilt edged Bonds

A sovereign bond is issued by the government and is typically denominated in the domestic currency to support planned and unplanned expenditures. Government bonds are also known as "sovereign debt" and are generally issued via auctions and traded in the secondary market. Government bonds issued in local currency are considered risk free as the Government, being a sovereign entity, can print the currency to repay its obligation to bondholders. However, as demonstrated during the European debt crisis (2008-2012), Governments may also default in debt payments in case of an emergency

situation. Because of their relative low risk, government bonds typically pay lower interest rates than the bonds issued by other issuers in the country.

In India, government bonds constitute the largest segment of the fixed income market. Other than Central Government Securities, this also includes the securities issued by the various State Governments and Union Territories, which are known as State Development Loans (SDLs). Indian Government Securities market (G-sec) also includes the special securities issued by the central and state governments in India. Special securities are issued by the Government for providing various subsidies like oil, fertilizer, bank recapitalization, etc.

1.3.1.2 Municipal Bonds

Local authorities may also issue bonds to fund projects such as infrastructure, libraries, or parks. These are known as “municipal bonds”. Municipal bonds are also known as "muni bonds" or "muni". A municipal bond is categorized based on the source of its interest payments and principal repayments. In India, while very few local authorities or municipal authorities have issued such bonds, the market is gradually picking up. In India, SEBI has issued separate regulation for Issuance and Listing of Municipal Bonds.

1.3.1.3 Corporate Bonds

A Corporate Bond and/or Non-Convertible Debentures (NCDs) is issued by a corporate to raise capital. The performance of the bond during its life depends on future revenues and profitability of the corporate. Debt is typically cheaper source of financing for corporates, and, unlike issuance of more equity, their ownership structure is not diluted. In some cases, the corporate’s physical assets may be used as collateral. Corporate bonds carry higher risk vis-a-vis government bonds and hence the bond holders expect higher interest rates to compensate for the additional risk they take while investing in the bond. Corporates issue short term papers like Commercial papers (CPs) to fund their short-term requirement or for their working capital funding.

The corporate papers are issued either through public issuance or private placements. The creditworthiness of the issuer (i.e., issuer’s ability to discharge its financial obligations) is to be assessed periodically by one or more credit rating agencies. The bond’s credit rating, and ultimately the company's credit rating, impacts the market price of the bond in both primary and secondary markets. The Credit Rating Agencies (CRAs) assign ratings through letter grades for their common and global understanding. The highest quality (and safest) bonds are given “AAA”, while the high risk bonds are known as "junk" or “high-yield bonds”. The difference between the yields on corporate bonds and government bonds is called the credit spread.

1.3.1.4 Securitized Debt

Securitization is the process of monetizing illiquid loan assets of a lender such as a bank, into a liquid pool of tradable assets. Securitization is achieved by creation of a Special Purpose Vehicle (SPV) and structuring the pool of loans into tradable bonds. Securitized (or asset-backed) securities transfer ownership of assets (i.e., loans and receivables) to the SPV.

1.3.2 Classification of fixed income securities based on Maturity/Redemption

Bonds are issued for various maturities depending on the requirement of funds as well as the demand from the investors. Long term bonds are generally costlier than short term loans as the funds are locked in for a longer period of time while investors may suffer from illiquidity. Bonds may be classified in terms of maturities like ultra-short term, short term, medium term and long term. Short term borrowings are typically made for working capital requirement where as long term funds are used for project, capital and infrastructure funding. The returns on bonds by similar rating class of issuers also vary according to the maturity, which forms the basis of yield curve theories.

1.3.2.1 Overnight Debt / Borrowings

Typically, banks borrow overnight funds from the money market as well as from the RBI. These borrowings can be collateralized or clean. Collateralized borrowings cost less vis-à-vis clean borrowings. The RBI plays a very important role in this market through absorption or supplying liquidity through banks and Primary Dealers.

1.3.2.2 Ultra-Short-Term Debt (Money Market)

Short term borrowings up to one year are covered under this category. Mostly, money market instruments like Commercial Papers (CP), Certificate of Deposits (CD), Treasury Bills (TB), Cash Management Bills (CMB), etc. belong to this category.

1.3.2.3 Short Term Debt

Bonds with maturity spanning from 1 to 5 years are referred to short term bonds. Issuer generally issued short term bonds mainly for cost effectiveness, operational flexibility, matching debt maturity with cash flow projection etc.

1.3.2.4 Medium Term Debt

These are bonds maturing in 5 to 12 years. These are also referred to as intermediate bonds. Generally, the bulk of debt issuances take place in this segment.

1.3.2.5 Long Term Debt

These are bonds with maturity beyond 12 years. Generally, Government of India bonds issued are of long-term maturity bonds.

Please note, there is no specific guideline for determining short term, medium term and long term debt. Mutual Funds classified debt funds based on “Duration” of bonds rather than maturity tenor of bonds.

1.3.2.6 Staggered Maturities

Some bond issues are packaged as a series of different bonds with different or staggered maturities. Every few years a portion of the bond issue matures and is paid off. Staggering maturities in this fashion allows the issuing company to retire the debt in an orderly fashion without facing a large one-time need for cash, as would be the case if the entire issue were to mature at once. Serial payments pay off bonds according to a staggered maturity schedule.

1.3.2.7 Perpetual Bonds (Consol Bonds)

These bonds will not have any maturity date and will continue to pay coupons during the life of the company. Banks are primary issuers of perpetual bonds. They issue perpetual bonds to meet Tier-I Capital requirement under Basel III norms.

1.3.3 Classification of fixed income securities based on Coupon

The promised interest as per the indenture of the bond is referred to as the coupon. The coupon payments on bonds have a pre-determined payment frequency and may be paid annually, semi-annually, quarterly or monthly. Bonds are classified on the basis of coupons, as these are returns on the investment made by the holders.

1.3.3.1 Plain Vanilla Bonds

A plain vanilla bond is the simplest form of a bond with a fixed coupon and defined maturity and is usually issued and redeemed at face value. It is also known as a straight bond or a bullet bond. These bonds have intermittent cash flows in the form of coupons received as well as the final cash flow of the face value of the bond on maturity.

1.3.3.2 Zero-Coupon Bonds

A zero coupon bond (ZCB) is a discounted instrument which does not pay any interest and are redeemed at the face value of the bond at the time of maturity. These bonds are issued at a discount and redeemed at the face value with the difference amounting to the return earned by the investor. ZCBs have a single cash flow at maturity which is equal to the face value of the bond. Common examples of ZCBs in India include Treasury Bills, Cash Management Bills and STRIPS created by separating and trading independently (in other words “stripping off”) the coupons from the final principal payment of normal bonds. ZCBs are highly sensitive to changes in the interest rate as they do not have intervening cash flows and are generally used by long term fixed income investors such as pension funds and insurance companies to gauge and offset the interest rate risk of these firms’ long-term liabilities.

1.3.3.3 Floating Rate Bonds

Floating rate bonds (FRBs) do not pay any pre-fixed coupons but are linked to a benchmark interest rate (generally a short-term rate like the 182-day Treasury bill rate etc. in India). The coupon rate is reset on each coupon payment date. When the general interest rate rises in the market, the benchmark interest rises and hence does the coupon on the FRBs. The same situation reverses when the interest rate falls. FRBs typically trade very close to their face value as interest resets happen at regular intervals. These instruments are generally immune to interest rate risk and are considered conservative investments.

1.3.3.4 Caps and Floor

Most FRB issuers may issue bonds which will cap their interest payment obligation if the interest rate rises. These instruments may also provide for a floor beyond which the

interest rate will not fall in order to protect the interest of the investors. If an FRB has both a cap to protect the issuer and a floor to protect the investor, it is called a "Collar".

1.3.3.5 Inverse Floater

These types of bonds are similar to FRBs in that the coupon is related to the benchmark linked to the bond (but it is inversely related in case of Inverse Floaters). If the benchmark increases, the Coupon falls and vice versa. For example, in India generally the interest rate on such bonds is linked to a negative spread over the fixed coupon rate. The spread is usually few percentage points over the benchmark MIBOR rate. If the interest rates go up, corporates end up paying less as the coupon will be a few percentage points lower than the original coupon rate. This has mostly been used by NBFCs to raise funds while mutual funds are the primary investors.

1.3.3.6 Inflation Indexed Bonds

These are a type of FRBs which protect investors from the adverse effects of rising prices by being indexed to an inflation measure like the WPI (Wholesale Price Index) or CPI (Consumer Price Index) in India. Only the face/par value or both par value and coupons may be indexed against the inflation measure.

1.3.3.7 Step Up/Down Bonds

Step up bonds are designed to pay lower coupon in the initial years of the bond and higher coupon towards maturity. These bonds are preferred by issuers like start-ups who expect their cash flows to balloon after some time and hence would like to service the bonds with lower cash flows at the beginning. The investors of these bonds also take higher risk as higher cash flows are expected after some time and hence expect higher interest rate to make the investment attractive. These bonds are generally risky.

Step down bonds are the exact opposite of step up bonds. These bonds pay high interest at the beginning of the bond and as the time moves towards maturity, the coupon drops. Such bonds are usually issued by companies where revenues/profits are expected to decline in a phased manner; this may be due to wear and tear of the assets or machinery as in the case of leasing. The step up and step down bonds are used for better cash flow planning of both issuers and investors.

1.3.3.8 Deferred Coupon Bonds

This is a mixture of coupon paying bond and a ZCB. In the initial years, these bonds do not pay any interest, but these bonds pay very high interest after a few years and typically few years before the maturity. The corporates having high gestation period typically prefer this kind of arrangement.

1.3.3.9 Deep Discount Bonds

When a zero coupon bond is issued at a high discount to the Face Value, it is generally referred to as a Deep Discount bond. Normally, a discount of 20% or more with relatively longer maturity is the main characteristics of the Deep Discount Bond. Typically,

infrastructure companies issue such kind of bonds as their gestation period is very long. These bonds carry high risk.

1.3.4 Classification of fixed income securities based on Embedded Options

An embedded option bond is an instrument with a provision of callability by the issuer and puttability by the investor. The optionality influences the price of the bond as the risk is higher for these bonds. The "Call" feature incorporates the right of the issuer to call back / repay the bond on a specific date before the original maturity date. The same way, the "Put" provision of the bond gives the right to seek redemption of the bond by the investor on a particular date before the original maturity date. A bond having call provision is likely to be called when the cost of refinancing the bond is low due to fall in interest rates. A bond having "Put" option may encourage the investors to submit the bond for redemption when interest rate rises. The bonds with embedded options are valued using option premia.

1.3.4.1 Straight Bonds

A straight bond is a bond that pays interest at regular pre-determined intervals and at maturity pays back the principal that was originally invested. A straight bond is also called a plain vanilla bond or a bullet bond. These bonds pay regular coupon which is typically fixed at the beginning or at the issuance time. It is the most basic form of debt investments.

1.3.4.2 Bond with a Call Option

A bond with a call provision gives the right to the bond issuer to call back the bond and pay the borrowed funds to investors before the original maturity date but at the pre-fixed call date. The issuer invokes this right only when the market interest rate is lower than the interest in the callable bond. However, the callable bonds generally require premium to be paid at the time of redemption when called.

1.3.4.3 Bond with a Put Option

A bond with a Put provision gives the right to the bond investor to seek redemption of the bond from the issuer before the original maturity date but at the pre-fixed put date. The investor invokes this right only when the market interest rate is higher than the interest in the puttable bond. However, these bonds generally require discount at the time of redemption when the investor chooses to redeem the same before maturity.

1.3.4.4 Bond with Call and Put Option

A bond with call and put provision gives right both to bond holder and issuer to redeem the bond before the original maturity date.

1.3.5 Classification of fixed income securities based on Security

All bonds are in essence fungible loans for which returns ultimately depend on the servicing ability of the issuer. Bonds can be secured or unsecured. Bonds may also be

secured against specific assets of the user. Hence, it is critical for investors to be aware of the priority in claims of the security they intend to invest in based on their risk appetite.

1.3.5.1 Secured debt

Secured bonds are backed by specific assets of the issuer. Secured bonds have collateral ranking and they would be paid first out of the assigned assets which have been collateralized against such debt. This makes it more secure with higher recovery rate vis-à-vis lower level unsecured bonds in the event the company defaults.

1.3.5.2 Unsecured debt

Unsecured debt instruments are issued by companies without any specific collaterals allocated against these issuances. Companies issue such unsecured debt using their name and reputation in the market.

1.3.5.3 Credit enhanced bonds

Credit enhancement is a strategy to show the investors that the company would be able to pay back the borrowings as there is some kind of guaranteed system in place to support the borrowings. It is a method whereby a borrower or a bond issuer attempts to improve the credit worthiness of its debt offering. Through credit enhancement, the lender or bond holder is provided with reassurance that the borrower will meet its repayment through an additional collateral, insurance, or a third party guarantee. A company lowers its cost of borrowing using credit enhancement. The credit enhancement also leads to better rating grade for the bond and reduces the risk for investors.

1.3.6 Based on Seniority

These can be senior or junior (subordinate) types depending on their claim in the company's asset at the time of liquidation. Bonds lower in priority of claims offer higher yields to compensate for the risk inherent in them.

1.3.6.1 Senior debt

These bonds have higher priority in the repayment hierarchy if the issuing company faces bankruptcy or liquidation. Senior debt holders are paid before other creditors, such as subordinated (junior) debt holders and shareholders. Because of its lower risk, senior debt typically carries lower interest rates compared to junior debt.

1.3.6.2 Subordinated debt

Subordinated bonds are issued by companies that pay higher coupon but are riskier as these bonds are paid out just before the equity holders at the time of liquidation. In India, banks issue subordinate bonds to shore up their Tier II capital as per the capital adequacy requirement.

1.3.7 Other Instruments

- Annuities are financial products that provide monthly payments over a certain period. Annuity is considered as fixed income asset class; however, it cannot be traded like fixed income securities in secondary market. Generally, in annuity you invest money, either as a lump-sum or over time. In exchange, you get income in the form of regular payments. There are several types of annuities, and they can be broken down based on when the payments start. Most consumer loans and housing loans are structured as annuities.
- AT1 (Additional Tier-1) Bonds: Under the Basel III framework, banks' regulatory capital is divided into Tier 1 and Tier 2 capital. Tier 1 capital is subdivided into Common Equity (CET1) and Additional Tier 1 Capital (AT-1). Equity capital is classified as CET1. Perpetual bonds that satisfy specific conditions stipulated by RBI are classified as AT-1. They are a type of unsecured, perpetual and non-convertible bonds that banks issue to shore up their core capital base to meet the Basel-III norms.
- AT2 Bonds: Tier 2 bonds are components of tier 2 capital, primarily for banks. These are debt instruments like loans. As with all bonds and other debt instruments, they do not give ownership or voting rights, but they do offer interest earnings to bondholders or owners. Banks issue Subordinated Tier 2 bonds to meet their Tier 2 capital requirements. These have to be for a minimum period of 5 years at the time of issue. They are unsecured and subordinated in claims to depositors, unsecured creditors and senior bonds of the bank. Bank Tier 2 bonds do not have Put Option and only have a Call Option (option for early repayment) which the bank can exercise after minimum of 5 years and after approval from Reserve Bank of India (RBI).
- Convertible Bonds: Convertible bonds are the bonds issued by corporates and such bonds get converted to equity shares at a specified time at a pre-fixed conversion price. The bondholder has the right to convert the said bonds to equity shares and issuing company cannot refuse the conversion as it is agreed at the time of the issuance.
- REITs (Real Estate Investment Trusts): REITs are trusts registered with SEBI that invest in commercial real estate assets. The REIT will raise funds through an initial offer and subsequently through follow-on offers, rights issue and institutional placements.
- InvITs (Infrastructure investment trusts): InvITs are trusts registered with SEBI that invest in the infrastructure sector. The InvITs shall raise funds from the public through an initial offer of units. The cash flow thus generated is distributed among investors as dividend income.
- Green bonds: A green bond is a type of fixed-income instrument that is specifically earmarked to raise money for climate and environmental projects. These bonds are typically asset-linked and backed by the issuing entity's balance sheet, so they usually carry the same credit rating as their issuers' other debt obligations.

- Tax-free bonds: Tax-free bonds are issued by a government enterprise to raise funds for a particular purpose. As the name suggests, its most attractive feature is its absolute tax exemption on interest as per Section 10 of the Income Tax Act of India, 1961.
- Tax Saving Bonds: These bonds offer tax benefits to owners, therefore helping them save a certain portion of their overall tax. Tax-saving bonds mainly come with a minimum lock-in period. Note that the interest earned through these bonds are taxable.
- Asset Linked Bonds: These bonds are issued giving better credit enhancement to the investors. These are linked to some assets and the payable capability depends on the underlying asset's ability to perform in the market.
- Environment, Social and Governance Debt Securities: SEBI vide circular dated June 05, 2025, provided framework for Environment, Social and Governance (ESG) Debt Securities(other than green debt securities). "Environment, Social and Governance Debt Securities or "ESG Debt Securities" means green debt securities, social bonds, sustainability bonds, sustainability-linked bonds, or any other type of bonds, by whatever name called, that are issued in accordance with such international frameworks as adapted or adjusted to suit Indian requirements that are specified by the SEBI from time to time, and any other securities as specified by the SEBI.
- Masala Bonds are rupee-denominated bonds issued outside India by Indian entities. They are debt instruments which help to raise money in local currency from foreign investors.

1.4 Equity Securities v/s Debt Securities

Equity securities/shares indicate ownership in the company whereas debt securities indicate a loan to the company. Equity securities do not have a maturity date whereas debt securities typically have a maturity date. Equity securities have variable returns in the form of dividends and capital gains whereas debt securities have a predefined return in the form of interest payments. Equity shareholders are entitled to voting rights whereas debt securities do not hold such rights. In the event of liquidation of company debt securities have higher preference and equities will have last preference. Typically, equity securities are riskier as compared to debt securities.

Advantages of Debt Compared to Equity

- Debt is a long term source of capital for borrowers.
- Borrowing through a debt paper by the owner would not reduce the control of the company for the borrower. Lenders of funds generally have priority over equity holders, in case of bankruptcy of the company.
- The lender would get the promised interest rate as per the indenture of the issue as well as the principal at the time of maturity. The lenders are indifferent to the profit made by the company that is shared as a dividend to the equity holders.

- In case of debt, the future obligations are mostly known to the company for making the cash flow planning and repayment planning. Hence, a proper and efficient cash flow management is key to the success of debt management.
- Interest or the coupon to be paid on debt is tax-deductible to the company as it is an expense for the company. This tax deductibility reduces weighted average cost of capital for the company. Higher the marginal tax rate of the company, larger is the benefit of such tax savings.
- Raising large amount of debt capital through private placement is generally less complicated as it is sold to qualified institutional buyers and unlike public issuances of equity, complex regulations may be avoided.
- For its debt obligations, the company is not required to send periodic mailings to large numbers of investors, hold periodic meetings of shareholders, or seek the vote of shareholders before taking certain actions.
- Debt is long term and lenders tend to be more committed than the equity holders.
- In the long-run, debt is cheaper than equity. The return on investment for equity holders is eventually higher than the interest paid on debt financing.

Disadvantages of Debt Compared to Equity

- Certain debt instruments may put restrictions on the company's core activities, and at times, exclusivity clauses can harm the company in general.
- Unlike equity, debt must be repaid at some point in time resulting in liquidity outflow.
- Debt repayment causes cash flow risk for the company and at times the company may not be able to refinance debt or raise money from the market to repay the existing debt if the market condition turns bad.
- Debt is a leverage action and high leverage can jeopardize the growth plans of the companies. High leverage may also increase the risk of default. Historically, many good companies have gone into bankruptcy due to the burden of huge debt.
- Debt obligations are fixed at the beginning of the issuance with future dates known to both issuers and lenders. These obligations have to be repaid irrespective of the market conditions.
- If repayment of debt is not properly planned, the company’s usual operations may get jeopardized because of such debt repayment obligations. At times, unplanned cash flow causes upheaval in working capital finance, jeopardizing production plan and operations of the company.
- The larger a company's debt-equity ratio, the riskier is the company considered by lenders and investors. Accordingly, there is a limit to the level of debt a business can take on its balance sheet.
- Some form of debt like secured debentures require the company to create a lien on the assets of the company or create sinking fund out of operational cash flows which may be burdensome at times, specifically at the time of market stress.

1.5 Concept of risk-free interest rate

Debt Securities are also known as fixed income securities as typically they have fixed tenor (life) and fixed cash flows. It should be noted 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. For example, consider a 7-year bond that pays 9% per annum interest and issued by a company. The 9% per annum interest is not the guaranteed return for the following reasons:

1. Credit risk: The Company may not be able to pay interest and principal as per schedule. This is called credit risk in the bond.
2. Price Risk (Interest rate risk): The 9% per annum will be the guaranteed return if the investor/holder holds the bond until its maturity of seven years. If the investor wants his investment back at the end of five years, he cannot demand prepayment from the issuing company but should sell it in the secondary market at the end of five years. The sale price may be higher or lower than the initial purchase price, resulting in capital gain/loss, which is not known in advance. This is called interest rate risk / market risk / price risk in the bond.

   In this example we have only considered risk of investor who is holding the debt securities. Interest rate risk is the uncertainty in the movement of the interest rates and hence, both way movement of interest rate will impact the participants. Interest rate risk can impact assets and liabilities, whether you are an individual, corporate, banks, financial institutions etc. For example, a borrower who wants to borrow money in future will carry the risk of increase in interest rate, on the other side a lender who wants to lend money in future will carry risk of decrease in interest rate. Participants like Banks, NBFCs have interest rate exposure on both asset and liability side for different tenor, hence these institutions may have exposure to either side of interest rate risk.
3. Reinvestment risk: If your investment horizon is seven years, ideally there should be no interim payments. If there are (such as interest payments in this example), they are to be reinvested until the horizon at unknown future interest rates. In the above example, the 9% coupon in the first year should be reinvested for six years at the end of one year; the 9% coupon in the second year will have to be reinvested for five years at the end of second year; and so on. Since the reinvestment rates (and income) are not known in advance, it is called reinvestment risk.

Additionally, there can be liquidity risk[1], call risk, inflation risk etc. attached to debt securities.

[1] There is a risk an investor might not be able to sell their bonds quickly due to a thin market with few buyers and sellers for the bond. This can lead to substantial price volatility and adversely impact a bondholder's total return upon sale.

Price Risk (Interest Rate Risk) and Reinvestment Risk

	Price Risk (Interest Rate Risk)	Reinvestment Risk
If interest rate goes up		
If interest rate goes down		

Credit Risk: Consider that the borrower is a sovereign government, and the borrowing is in home currency. There is no possibility of default by the borrower because the sovereign can always print money and pay off the lender. In other words, there is no credit risk in this transaction. The interest rate applicable to such transactions is called "risk-free" rate, the risk here being the credit risk.

For borrowers other than the sovereign government, there is some chance of default. Therefore, the interest rate applicable to such non-sovereign borrowers must be higher than the corresponding rate for sovereign borrower. The difference between them is called the "credit spread". In practice, all borrowers are grouped according to their credit rating (which is a measure of credit risk), and the interest rate is quoted as an add-on spread over risk-free rate. For example, if the risk-free rate is 8.25% and the credit spread is 0.10% for AAA-rated borrowers and 0.25% for AA-rated borrower, the interest rate applicable to the last two are, respectively, 8.35% (i.e., risk-free rate of 8.25 + credit spread of 0.10) and 8.50% (i.e., risk-free rate of 8.25 + credit spread of 0.25).

The risk-free rate is the benchmark for *all* valuations because it represents the return without risk. All other financial instruments have various risks (such as credit risk, market risk, etc.). To bear these risks, investors would demand premium, which is an add-on amount to the benchmark return represented by risk-free rate. We may say that risk-free rate is the opportunity cost of earning return without risk.

Market risk: It disappears if the investor holds bond till maturity date when it will be redeemed directly by the issuer at face value.

Reinvestment risk: It disappears if the instrument is a zero-coupon instrument because there is nothing to reinvest in the interim as interest is received at the time of maturity.

Thus, if a person buys a zero-coupon instrument, without any embedded call option, issued by a sovereign government in its home currency and held it till maturity, there is no risk; and the fixed-income security is also a fixed-return security.

1.6 Term Structure of Interest Rates

What is the interest rate today? This question cannot be precisely answered because it is incomplete in two respects. First, the rate depends on the term (or tenor) of borrowing/lending period. Though the periods can be many, the market quotes rates only for "standard" terms/tenors, which are as follows in money and bond market.

Money market: Overnight (ON), 1-week (1W), 2-week (2W), 1-month (1M) to 1-year (1Y) at the interval of a month.
Bond Market: 2Y, 5Y, 7Y, 10Y, 15Y, 20Y, 25Y, 30Y and 40Y.

Second, even for the same term, the rate differs from borrower to borrower because the credit risk is priced and incorporated into the transaction rate. For the sovereign borrower, the rate is directly quoted for each term; and for non-sovereign borrowers (grouped by credit rating), what is quoted is the add-on credit spread, representing the price of credit risk. The following tables shows the hypothetical interest rates for various terms and for various borrowers rated by their credit rating (AAA, AA, A, BBB, etc.)

Term	**Risk-free rate**	**Credit Spread**		
		AAA	**A**	**BBB**
1M	5.00%	0.15%	0.25%	0.35%
3M	5.25%	0.25%	0.50%	0.75%
1Y	5.75%	0.40%	0.75%	1.10%
5Y	6.50%	0.85%	1.50%	2.25%

When the interest rate (on vertical axis) is plotted against the term (on horizontal axis), it is called the *term structure* of interest rates (also known as yield curve). Thus, we have "risk-free curve", "AAA curve", "BBB curve", and so on.

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." Without term structure of rates, valuation becomes speculative rather than objective.

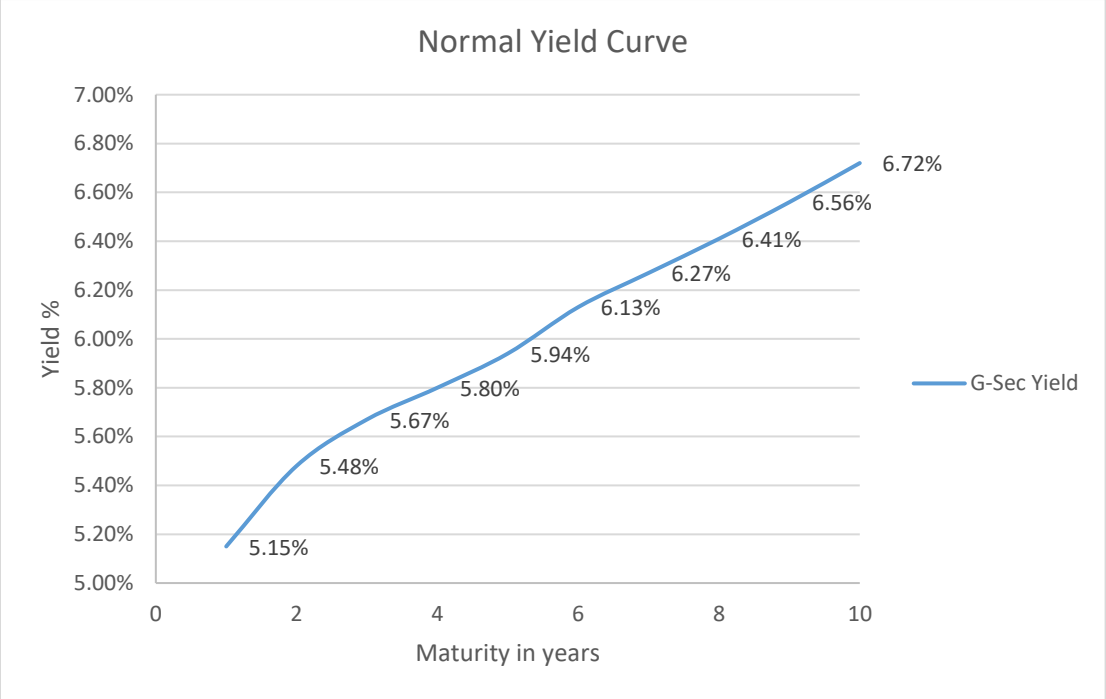
But what determines the interest rate? The answer is demand-supply for money for different terms or periods. For example, the demand-supply for money borrowing/lending for 1Y term determines the 1Y interest rate, and so on. It is convenient to assess the demand-supply separately for short-term (i.e., 1Y or less, which is money market) and long-term (i.e., more than 1Y, which is bond market). The short-term rate is determined by liquidity, which in turn is caused by seasonal demand-supply for credit, foreign portfolio investment inflows and outflows, bunching of tax and government payments, etc. The long-term rate is predominantly determined by inflation outlook and the capital expenditure by industry and businesses.

In developed economies, central bank monitors and controls only the short-term interest rate, but in developing and emerging economies, central bank influences long-term rates, too. The central bank uses the repo and reverse repo with commercial banks to control the short-term rate. It uses repo (i.e., repo for commercial bank) to inject liquidity into money market and reverse repo (i.e., reverse repo for commercial bank) to drain excess liquidity. To control long-term interest rate, the central bank uses bank rate (i.e., the rate at which the central bank lends to commercial banks), cash reserve ratio, statutory

liquidity ratio and open market operations. In the Indian market, there is distortion of free play of demand-supply forces for determining the interest rate. The reason for this is that the statutory liquidity ratio (SLR) requires banks to compulsorily invest certain % of the 'time and demand deposits' into sovereign debt, and the government decides what interest rate is acceptable to it. This is somewhat forced lending to the government at artificial interest rate. It also creates what is called "uncovered interest rate parity[2]" between the interest rates in India and other countries.

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

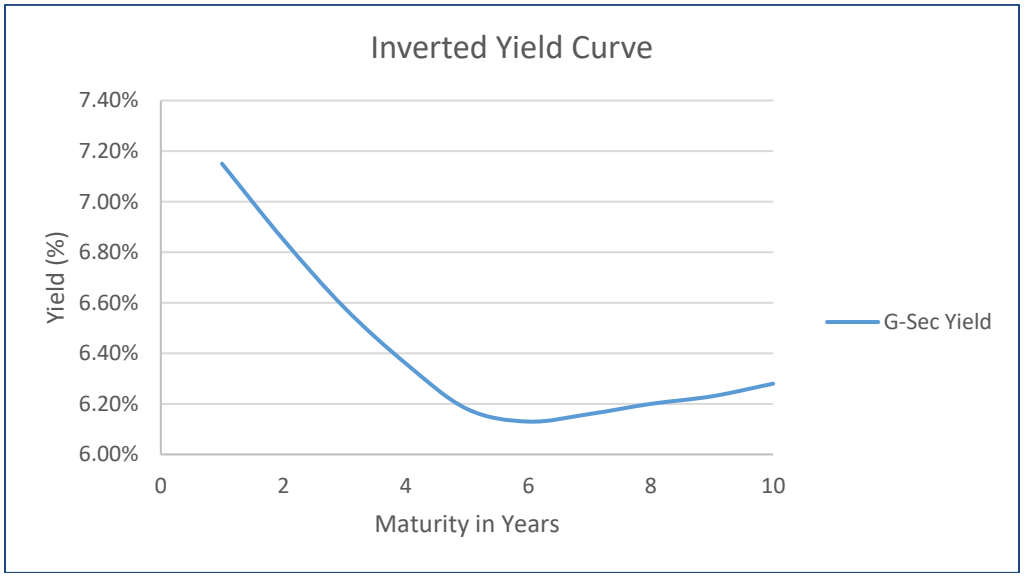
1. **Normal Yield curve:** This is an upward sloping yield curve indicating higher yield for higher maturity. Long term yields are higher compared to short term yields as the risk premia is higher for higher maturities. It is thought to reflect the higher inflation-risk premium that investors demand for longer term bonds. The positive slope of the yield curve here reflects investors' expectations for the economy to grow in the future and, importantly, for this growth would be likely to be associated with a greater risk of inflation in the future.



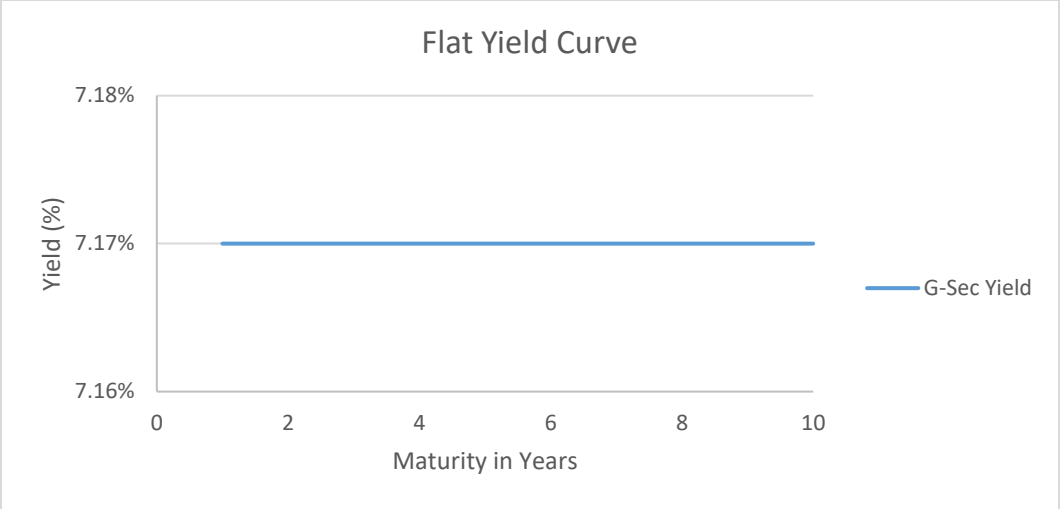
2. **Inverted Yield curve:** In this kind of curve, the short term yields are higher than the long term yields. At times, the policy rates are kept high to bring down excess demand and reduce financial bubbles created due to easy availability of credit and use of high leverage by the borrowers. At times, severe asset liability mismatch

[2] Uncovered interest rate parity (UIP) theory states that the difference in interest rates between two countries will equal the relative change in currency foreign exchange rates over the same period.

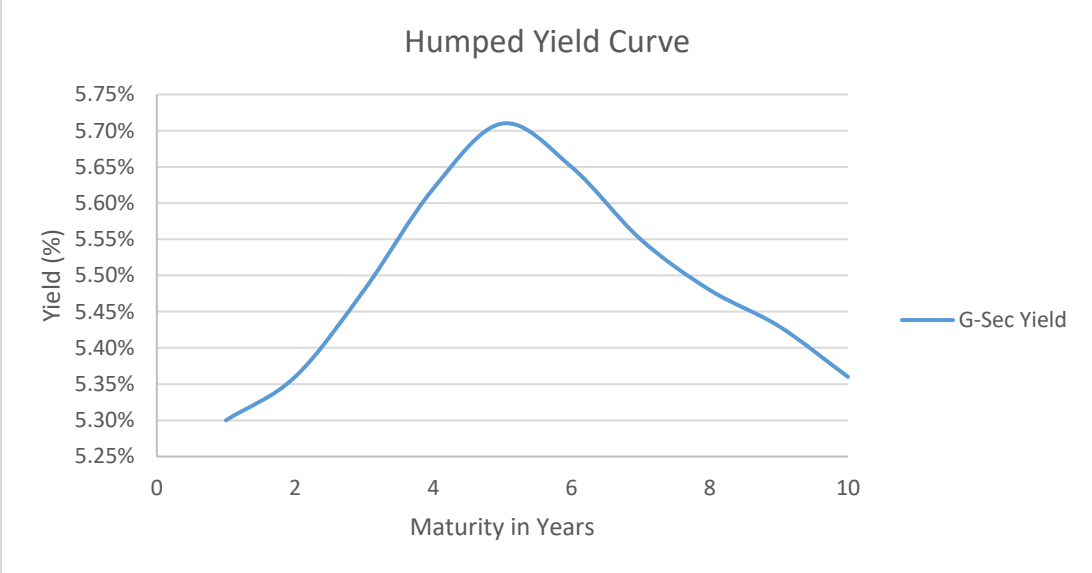
may also produce inverted yield curve. Typically, borrowers tend to create long term assets out of short term liabilities assuming the possibility of rolling over their borrowing and easy access to credit because of smoother availability of funds. An inversion happens, if assets are not sufficiently maturing to pay back the maturing liabilities and the borrower is not able to get easy credit, the short term demand for funds can be very high resulting in very high interest rate at the short end and lower interest at medium term. This shape is often seen when the market expects interest rates to fall. Under this abnormal and contradictory situation, long term investors may settle for lower yields now if they think the economy is likely to slow or even decline in the future. An inverted yield curve may indicate a worsening economic situation or recessionary situation in the future. However, technical factors such as a flight-to-quality or global economic or currency situations may cause demand for bonds on the long end of the yield curve causing rates to fall.



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. A small or negligible difference between short- and long-term interest rates occurs later in the economic cycle when interest rates increase due to higher inflation expectations and tighter monetary policy. This is called a shallow or flat yield curve and higher short-term rates reflect less available money.



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.



1.6.1 Term Structure of Rates: Shifts

Term structure is a snapshot of rates at a point of time, and there are many theories and economic arguments to explain the shapes. What is more important is, not the shape, but how it changes over time, which is called term structure "shifts". The shifts describe the *relative* moves of long-term rate (LR) and short term rate (SR), and they are grouped into three: parallel, steepening and flattening, as summarized below:

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.

Shift	Description
	The curve shifts in clockwise direction.
Parallel	All rates move in the same direction by same extent

Steepening and flattening can occur in three ways: both rates move in opposite direction; both rates move in the same direction (either both rise or both fall) but by different extent; and one rate remains constant and the other changes (either rise or fall). The first is called "twist" and the last two are called "convexity change".

Before				After				Shift
SR	LR	Spread	Shape	SR	LR	Spread	Shape	
7.00%	8.00%	+1.00%	Normal	6.90%	8.10%	+1.20%	Normal	Steepening – twist
7.00%	8.00%	+1.00%	Normal	7.10%	8.20%	+1.10%	Normal	Steepening – Convex change
7.00%	8.00%	+1.00%	Normal	6.80%	7.90%	+1.10%	Normal	Steepening – Convex change
7.00%	8.00%	+1.00%	Normal	6.90%	8.00%	+1.10%	Normal	Steepening – Convex change
7.00%	8.00%	+1.00%	Normal	7.00%	8.10%	+1.10%	Normal	Steepening – Convex change
7.00%	8.00%	+1.00%	Normal	7.10%	8.10%	+1.00%	Normal	Parallel
7.00%	8.00%	+1.00%	Normal	6.90%	7.90%	+1.00%	Normal	Parallel
7.00%	8.00%	+1.00%	Normal	7.10%	7.90%	+0.80%	Normal	Flattening – twist
7.00%	8.00%	+1.00%	Normal	7.20%	8.10%	+0.90%	Normal	Flattening – Convex change
7.00%	8.00%	+1.00%	Normal	6.90%	7.80%	+0.90%	Normal	Flattening – Convex change
7.00%	8.00%	+1.00%	Normal	7.10%	8.00%	+0.90%	Normal	Flattening – Convex change
7.00%	8.00%	+1.00%	Normal	7.00%	7.90%	+0.90%	Normal	Flattening – Convex change
8.00%	8.00%	0	Flat	8.10%	8.10%	0	Flat	Parallel
8.00%	8.00%	0	Flat	7.90%	7.90%	0	Flat	Parallel
8.00%	8.00%	0	Flat	8.00%	8.10%	+0.10%	Normal	Steepening – Convex change
8.00%	8.00%	0	Flat	8.10%	8.20%	+0.10%	Normal	Steepening – Convex change
8.00%	8.00%	0	Flat	7.90%	8.10%	+0.20%	Normal	Steepening – twist

1.7 Conversion of Rate into Amount

The market practice is to always quote interest rate as percentage per annum, but in the settlement of transaction, the interest *rate* is converted into interest *amount*. The

conversion requires the following parameters to be specified: payment frequency, compounding frequency, day count fraction.

1.7.1 Simple Interest (SI) and Compound Interest (CI)

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. So, in effect, the simple interest rate remains static from year to year whereas the compound interest rate increases over each year.

The basic formula for simple interest is:

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

The basic formula for compound interest is:

Interest for Year 1 (I_1) = Principal * Interest rate p.a. * (Time which is 1 year)

Interest for Year 2 (I_2) = (Principal +I_1) * Interest rate p.a. * (Time which is 1 year)

Interest for Year 3 (I_3) = (Principal + I_1 + I_2) * Interest rate p.a. * (Time which is 1 year)

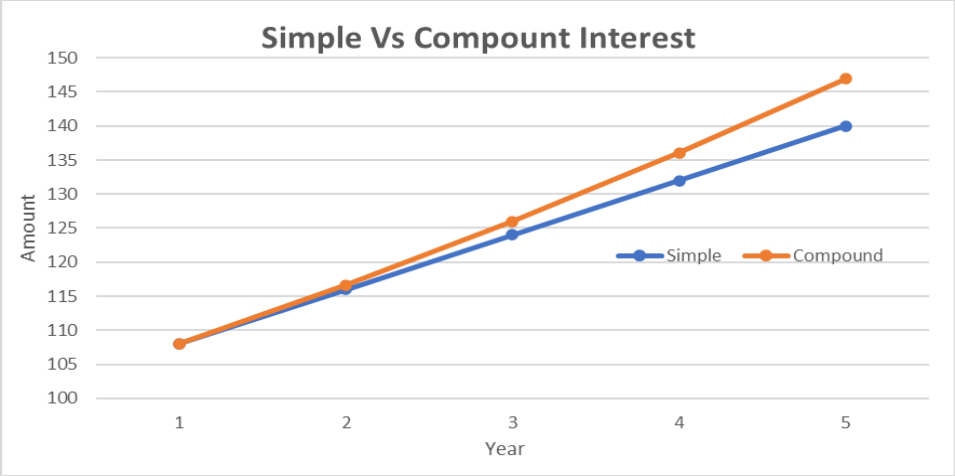
And so on……

Example: For an investment of ₹100 that earns 8% p.a., over five years, the growth in the investment would look like this:

Table: Comparison of Simple Interest and Compound Interest

	Principal at beginning of the period (₹)		Interest @ 8% (₹)		Principal + Interest at the end of year (₹)	
Year	Simple	Compound	Simple	Compound	Simple	Compound
1	100.00	100.00	100 * 8% =8	100 * 8% =8.00	108.00	108.00
2	108.00	108.00	100 * 8% =8	108 * 8% =8.64	116.00	116.64
3	116.00	116.64	100 * 8% =8	116.64 * 8% =9.33	124.00	125.97
4	124.00	125.97	100 * 8% =8	125.97 * 8% =10.08	132.00	136.05
5	132.00	136.05	100 * 8% =8	136.05 * 8% =10.88	140.00	146.93

Chart: Simple Vs Compound Interest



1.7.2 Single Period Investment

When investment is made for a single period (like a year), the investor gives money today and receives the principal and promised interest at the end of that period. The investor only earns a simple interest in a single period. For example, an investment of ₹2000 at 9% for one year would result in ₹2000+₹2000*9% = ₹2000 (1+9%) = ₹2180. This is the Future Value of the investment of ₹2000 made today at an interest rate of 9% per annum for a single period of one year.

Future Value for one period = Principal * (1 + Interest Rate %) or FV = PV (1 + r%)

where, FV = future value, PV = present value and r = periodic rate of return.

Then, PV = FV/ (1 + r%)

1.7.3 Multi-period Investment:

When multiple periods are involved in an investment, the present value would be calculated assuming reinvestment of the future stream of income at the agreed rate. If our ₹2000 is invested for 5 years, the Future Value would be ₹2000*(1+9%)^5 = ₹3077.25.

Hence, for multi-period investment:
Future Value = Principal * $(1 + \text{Interest Rate})^{\text{time}}$
or
$FV = PV (1 + r)^{t}$
where FV = future value, PV = present value, r = periodic rate of return and t = number of periods invested. Single period is a simple case of the above rule with t=1.
Then, $PV = FV/(1 + r)^{t}$
These calculations of future value recognize interest-on-interest (compounded interest). In the example above, the interest would have been (=₹2,000*9%*5), or ₹900, if simple interest was calculated. Instead, since interest was earned on interest, the total amount earned has become ₹1077.25, when compounding was applied.

In general, the future value of money invested for *t* years with interest credited and re-invested at the end of each year is:

$$FV = PV (1 + r)^{t}$$

The expression $(1 + r)^{t}$ represents the future value of ₹1 invested today for *t* period at a compounding rate of *r.*
For example, suppose that an investment manager invests ₹1,00,000 in a debt obligation that promises to pay 7.3% p.a. for 4 years. The future value of the ₹1,00,000 investment is ₹1,32,555.85:

$$FV = ₹1,00,000*(1+7.3\%)^{4}$$
$$= ₹1,00,000*(1.3255585)$$
$$= ₹1,32,555.85$$

The above example demonstrates the computation of the future value of an investment when interest is paid annually. When interest is paid multiple times in a year like half-yearly, quarterly, monthly, etc., we need to adjust the frequency of payment and interest rate.

$$r = \frac{\text{Interest rate p.a.}}{\text{No. of times interest paid in a year}}$$

n = No. of times interest paid in a year * number of years

In the above example, if interest is paid semi-annually (i.e., paid twice in a year), then

$$r = \frac{0.073}{2} = 0.0365$$

$n = 2 * 4 = 8$

$FV = ₹1,00,000*(1+0.0365)^{8}$

$= ₹1,00,000*(1.332154)$

$= ₹1,33,215.41$

When interest is paid multiple times, the investor gets reinvestment option for the received interest and accordingly the total value of the investment increases due to the power of compounding. Hence, an investment with semi-annual coupon payment would be valued more than the same investment with an annual compounding. A quarterly compounding rate fetches a much higher value. The following table explains the same:

Payment Frequency	Effective rate for 12% investment
Annul	12.00%
Semi-annual	12.36%
Quarterly	12.55%
Monthly	12.68%

1.7.4 Day count fraction (or day count basis)

It specifies how to convert the payment period into year fraction (e.g. 6M = 0.5Y). For this conversion, we must agree on counting the number of days in a year and in the interest accrual period. It is expressed as a fraction. The numerator indicates the method of counting the number of days in the payment period; and the denominator indicates the total number of days in a year or 'full coupon period'.

It is the convention in all markets to include the first day of the period and exclude the last day of the period for interest accrual. For example, in the period from 30-April-2021 to 05-May-2021, there is one day in April and four days in May.

A particular market will apply one of the following day count conventions:

1. *Actual/Actual day counting:* This takes into account the actual number of days between the last coupon date and the next coupon date. This is very helpful for the Leap year when we have one day more for the year. In India this is widely used for corporate bond securities.

2. *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. If the day of either

start date or end date is 31, it is arbitrarily set to 30. This is widely used for Indian government securities market. Day count conventions can be explained as follows:

$$Day\ count\ Fraction = \frac{[360 * (Y2 - Y1)] + [30 * (M2 - M1) + (D2 - D1)]}{360}$$

where:
"Y1" is the year pertaining to the year of the start date (last coupon date);
"Y2" is the year pertains to the year of the end date (settlement of cash flow date or next coupon date);
"M1" is the calendar month pertaining to the start date (last coupon date);
"M2" is the calendar month pertaining to the end date (settlement of cash flow date or next coupon date);
"D1" is the first calendar day, expressed as number, of the Calculation Period or Compounding Period, unless such number would be 31, in which case D1 will be 30; and
"D2" is the calendar day, expressed as a number, immediately following the last day included in the Calculation Period or Compounding Period, unless such number would be 31, in which case D2 will be 30.

For example, the accrual period is from 31-Dec-2020 to 25-Jan-2021. The day of the start date, being 31, needs to be shortened to 30, while the day of the end date requires no adjustment. After the adjustment, the Y2, Y1, M2, M1, D2 and D1 are 2021, 2020, 1, 12, 25 and 30, respectively.

$[360 \times (2021 - 2020) + 30 \times (1 - 12) + (25 - 30)] / 360 = 25/360.$

Similar to this we can have 30/360 (American) Day Counting

Lets take another example to understand difference between Actual/Actual and 30/360 Day counting.

Find the accrual factors for the period from June 1, 2019 to September 1, 2019.

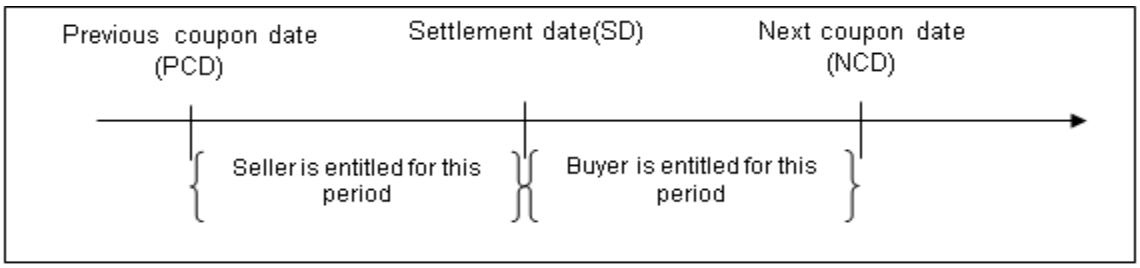


3. *Actual/365 Day Counting*: In this convention, the coupon days are calculated as actual number of days in between two dates but the year is considered as 365 days. This day count convention is used in Indian money market.
4. *Actual/360 Day Counting*: In this convention, the coupon days are calculated as actual number of days in between two dates but the year is considered as containing 360 days. This is widely used in Swap valuation.

Globally, different countries use different conventions for their fixed income markets. In addition, these may be different for money market and bond market in same geography (e.g. India).

1.8 Accrued Interest

Accrued interest is a market practice peculiar to bond market. Accrued interest applies only when a bond is a coupon bond (or any other instrument for which coupon for the current interest period is known). 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. Accrued interest is the interest accrual at coupon rate from the previous coupon date to the settlement date of the trade. Let us see the timeline of different dates in the following figure:



The settlement date of the secondary market trade falls between two coupon dates, which we will designate as previous coupon date and next coupon date. Between previous coupon date and settlement date, it is the seller that owns the bond and therefore is entitled to receive the interest accrual for this period. Similarly, it is buyer that owns the bond between settlement date and next coupon date and therefore he is entitled to the interest accrual only for this period. However, the issuer does not keep track of who owns the bonds for which period during the coupon period. Whosoever owns the bond on next coupon date, he gets the coupon for the full period. Accordingly, the buyer gets the coupon for the full period, which means that the seller is deprived of his entitlement. To make the trade fair to both parties, buyers computes the interest accrual from previous coupon date to settlement date and pays to the seller as an add-on amount of "accrued interest" at the time of settlement, and gets it reimbursed on the next coupon date. Day count convention is very important for computation of accrued interest.

For example, in case of Actual/Actual, in the case of a 6.90% bond paying semi-annually, whose previous coupon date was the January 13, 2021, and next coupon date is July 13, 2021, the accrued interest on March 5, would be:

$$\mathrm{AI} = \frac{6.90}{2} * \frac{51}{181} = 0.972099$$

In case of 30/360 (E), in the case of the 6.90% bond paying semi-annually, whose previous coupon date was the January 13th and next coupon date is July 13th, the accrued interest on March 5th, would be:

$$\text{AI} = \frac{6.90}{2} * \frac{52}{180} = 0.996667$$

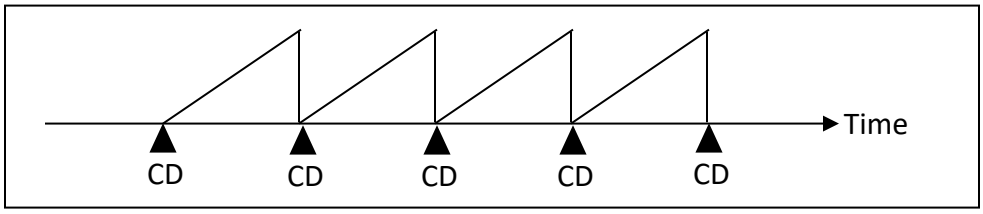
Now, if clean price of the bond is Rs. 101.50, then

Dirty price = clean price + accrued interest

Dirty price = Rs. 101.50 + Rs. 0.9967 = Rs. 102.4967

Generally in market, trading / quotation is done at clean price and settlement happens on dirty price.

A logical question is why not include accrued interest in the market price or clean price of the bond so that the negotiated price (or clean price) recorded in the deal ticket is the same as the settlement price (or dirty price)? If we incorporate the accrued interest in the market price of bond itself, the result will be a periodic rise-and-fall pattern in bond price between two coupon dates. Because the daily interest accrual is constant, the price will rise smoothly every day by daily accrual amount from one coupon date (CD) to the next and falls abruptly by the full coupon amount on the next coupon date.



This is how the bond price will change between two coupon dates if accrued interest is incorporated in market price. And this pattern of change will repeat in all other coupon periods. This saw-tooth like price change is in addition to two other sources of price change, which are price change due to change in interest rate; and price change due to change in credit rating of the issuer. The former affects all bonds, and the latter will affect only the bonds of a particular issuer. Of the three sources of change in bond price, that due to accrued interest is known in advance, but that due to interest rate and credit rating changes are not known in advance. The known changes are called 'deterministic', and the unknown changes are called 'stochastic'. Traders would like to monitor only the stochastic changes. There is no use of monitoring deterministic changes, which are already known. Therefore, accrued interest is removed from the market price, and is made an add-on amount in the settlement.

Accrued interest is peculiar to bond market. Its equivalent in equity market, which is 'accrued dividend' does not exist. One may argue that dividend is contingent and not known in advance. However, after the company announces the dividend pay-out, the amount is known. Therefore, for all trades in secondary market between announcement date and ex-dividend date, the concept of 'accrued dividend' can be implemented.

Dividend's contribution to the total return from equity is negligible. Therefore, the concept of 'accrued dividend' is ignored. Coupon's contribution to total return from bond may be 50 – 100%. Therefore, the concept of 'accrued interest' cannot be ignored.

1.9 Spot Rate (Zero Rate) and Holding Period Return

Return on investment is the most important measure of performance. It has the following properties:

- Expressed as a rate per annum
- If there is income before the investment term, the income has to be reinvested until the term
- Compounding at less than yearly intervals, if required, is incorporated

If there is no interim income, then it is simple to compute the return as follows:

$$\left\{\left[\frac{F}{P}\right]^{\frac{1}{N \times C}} - 1\right\} \times C$$

where

- F = final amount received (i.e., face value)
- P = initial amount invested (market price)
- N = number of years
- C = compounding frequency

The first term, (F/P), is the growth factor: it indicates how much the unit amount has grown into over the entire investment term. For example, if Rs 100 grows into Rs 150 over three years, the growth factor is 1.5: one unit has grown into 1.5. The exponent term, the reciprocal of (N $\times$ C), converts the growth factor from "per investment period" to "per compounding period". The third term, deducting unity from the "per compounding period" growth factor, converts it from growth factor to growth rate. The fourth term, *C*, converts the "per compounding period" growth rate into annualized compounded growth rate, which is how the return is expressed. Using the same example of Rs 100 resulting into Rs 150 after three years, the return measure with different compounding frequency is:

With annual compounding: $\left\{\left[\frac{150}{100}\right]^{\frac{1}{3 \times 1}} - 1\right\} \times 1$ = 14.4714%.

With semi-annual compounding: $\left\{\left[\frac{150}{100}\right]^{\frac{1}{3 \times 2}} - 1\right\} \times 2$ = 13.9826%.

With quarterly compounding: $\left\{\left[\frac{150}{100}\right]^{\frac{1}{3 \times 4}} - 1\right\} \times 4$ = 13.7464%.

With monthly compounding: $\left\{\left[\frac{150}{100}\right]^{\frac{1}{3\times12}} - 1\right\} \times 12$ = 13.5919%.

The above is the true and realized return. In the above example, we can say that we have earned 13.5919% per annum for every month for the next three years, and the interest earned every month is automatically reinvested at the same rate of 13.5919% per annum until the end of three years. This return, which is the realized return, is also called *zero rate* or *spot rate*. A 5Y zero rate of 7.5% means that the return on initial investment is 7.5% for first year, which is reinvested automatically for four more years at the same rate of 7.5%; the return for the second year is 7.5%, which is reinvested automatically for three more years at the same rate of 7.5%, and so on.

For zero-coupon securities (i.e. discount instruments), it is possible to readily compute the true return or zero rate because there are no interim cash flows. The redemption value corresponds to the *F* and the initial purchase price corresponds to the *P*. For coupon bonds and annuities, it is not possible to compute true return because of interim cash flows, which need reinvestment until maturity. The reinvestment rates are not known until the reinvestment time (except when the future cash flows are locked through interest rate derivatives), and therefore true return is not known at the beginning ("ex ante") but known only at the end of investment period ("ex post"). At the end of investment period, all the reinvestment rates are known, and we can compute the true return, which is called *holding period return* (HPR). Since HPR can be computed only ex post and not ex ante, some other approximate measures of return are developed for coupon bonds and annuities. They are *coupon*, *current yield* and *yield-to-maturity*.

The main weakness of the yield to maturity yield curve stems from the assumption of a constant rate for coupons reinvested during the bond's life. This ignores time value of money aspect. However, to take care of time value of money, we need to use the spot rates or zero coupon yield curve. We will see these in detail in section 1.11.4.

1.10 Coupon, Current Yield and Yield-To-Maturity

1.10.1 Return from Bonds

Fixed income investors or investors who purchase a bond may benefit from that investment in many ways:

- periodic coupon as per the terms in the indenture of the bond;
- capital gain if interest rate falls (it may also result in capital loss if interest rate rises), in case the instrument is traded before maturity;
- reinvestment of the cash flows received during the life of the bond (akin to interest on interest).

1.10.1.1 Coupon Income

A coupon income is the regular flow of money or return to the investor or lender as promised by the borrower. When we say, for example, 7% GS 2027, we mean the security is a Government Security, paying an Annual Coupon of Rs 7 on a Face value of Rs 100.

Typically, the coupons are paid semi-annually and hence the investor would receive the coupon of Rs 3.50 every half year.

Coupon is the promise of the borrower to pay a certain amount of money at regular intervals to the lender during the life of a bond or a note. In earlier years, bonds issued by Governments or central banks on behalf of sovereign Governments used to be bearer bonds and were repaid on physical presentation of the appropriate instrument. Smaller tokens/coupons used to be attached to such bearer bonds indicating a specific amount that was payable on a specific date mentioned on such tokens/coupons so that investors could collect the same on physical presentation of those tokens/coupons. The coupon used to be fixed for the bearer bonds. Bond coupons are the biggest source of income for the bond holders. As per indenture, the specified yearly coupon amount is typically paid semi-annually.

Indenture of Government Bond 7.17% GS 2028 (08-Jan-2028) specifies coupon payment twice in a year on 08-Jan and 08-July till it matures on 08-Jan-2028. An investor will receive Rs 3.585 (i.e., half of Rs 7.17) on every coupon date per each bond held. Rs 7.17 is calculated using the face value of Rs 100 (i.e., as 7.17% p.a. on Rs 100).

A Zero Coupon Bond investor doesn't receive any coupon during the investment period. At the end of the investment period, investor will receive the face value Rs 100. In India, GOI treasury bills are issued as Zero Coupon Bonds. If the bond buyer buys a Floating rate bond linked to a benchmark like 182-Day T-Bills, the investor would receive varying coupons depending on the interest rate paid on a 182-day T-Bill on the coupon date.

1.10.1.2 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. If the investor holds till maturity, investor's rate of return would remain fixed but if the investor desires to exit the investment anytime during the life of the bond, his/her investment would either gain in value (if the present market interest rate has fallen vis-à-vis promised coupon) or it would have reduced in value (if the present market interest rate has gone up). There will be capital appreciation during the life of the bond, if the interest rate in the market falls and the original investor sold the bond at such times, though at maturity the return would be only the face value.

Typically, coupon is set on the issuance date based on the interest rate prevailing in the market for a particular class of bonds with a particular maturity. For example, the issuer issuing the AAA rated bond of 10 years maturity would pay the interest rate prevailing in the market on the date of issue for similar kind of bonds. After issuance, changes in the economic scenario do make the interest rate change. If the interest rate rises, the market value of the investment would come down and if the interest rate falls, the market value of the instrument would increase. This fall / rise in market value is a capital depreciation / appreciation of the bond if it is sold during this time before maturity. If the bond is held till maturity, this interim fall and rise of interest rate would have no meaning for the investor. Appreciation and depreciation in value of the bond is very important to traders

as their investment has to be recorded in their books of accounts as per the market value of the bond.

If our investor of 7.17% GS 2028 faces the interest rate changes lower than 7.17%, the bond would be selling at a price higher than Rs 100 in the market. Therefore, the investor would make a gain out of this bond when interest rate falls below 7.17% but the investor would make loss if the interest rate rose above 7.17%. The rule is when interest rate falls, the investor gains but when interest rises, the investor faces loss.

Further, long term bonds pay a 'term premium'. The 'term premium' is the amount by which the yield on a long-term bond is greater than the yield on shorter-term bonds. This premium reflects the amount investors expect to be compensated for lending for longer periods (and therefore longer periods of uncertainty).

1.10.1.3 Reinvestment income

The investor receives periodic interest or coupon on the debt investment. The same is reinvested on assets which would yield further income. For example, when a semi-annual coupon payment is received by our investor from the investment on 7.17% GS 2028, the investor would have the ability to invest that cash flow of Rs 3.585 in another asset on such coupon receiving date. The yield to maturity (YTM) assumes the reinvestment of the future coupons at the same rate (i.e., at YTM). This is because the bond price equation assumes the same yield to discount all future cash flows (i.e., both the coupons and the redemption value).

1.10.2 Yield Measures

Bonds exhibit various characteristics with respect to being securities as below:

- Different maturities with the same coupon
- Different coupons for the same maturity
- Different ratings for the same coupon and maturities
- Different redemption values with varied maturity

These characteristics affect price of the bonds in a very explicit way. Price of a bond cannot be used to compare the relative attractiveness with another bond because of the above reasons.

Bonds' price does not give much information to the investors. If a bond maturing in 10 years of time with a coupon of 10% trades at Rs 117.37 and another bond with 10-year maturity with a coupon of 8% trading at Rs 103.47 and still another bond of 10-year maturity with 6% coupon trading at Rs 89.58, the investor gets the same return of 7.5% p.a., when converted into implied yield from their prices, given maturity and the coupons, assuming the above three bonds belong to the same rating class. The returns on investment on bonds have to be compared using a unified measure like the yield an investor gets from such bonds. Yields can be compared to find out the relative attractiveness of various investments. For an investor, yield of a bond also provides information about the bond being fairly valued.

1.10.2.1 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. It assumes only one period investment and it can rank all the bonds. Any bond in which the current yield is lower than the other short term interest rate, it would imply that the bond has holding (running) cost. This means that the investor would relatively be less compensated by investing in this bond vis-à-vis other short term instruments which are more attractive in terms of return.

It calculates the bond's coupon income as a proportion of the clean price paid for the bond. The formula used to calculate current yield is:

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

Example: Bond 7.17% GS 2028 (8-Jan-2028) is trading at Rs 96.2290 (clean price). The current yield of this bond is 7.45% [= (7.17/96.2290)*100)] vis-à-vis the coupon of 7.17%.

1.10.2.2 Yield to Maturity (YTM)

The most widely observed yield is known as the "Yield to Maturity" (or YTM) which is commonly referred to as "Yield" in the market. For any bond traded in the market, the YTM is derived assuming that the investor would hold the bond until maturity and all future interest rates would be remaining the same as the discount rate so that all future coupons when received in future would be reinvested at the same Yield.

In this case, "Yield" is the interest rate that would make present value of the known future cash flows of the bond equivalent to the current price of the bond. We know the equation:

$$PV = \sum_{n=1}^{N} \frac{C_n}{(1+r)^n} + \frac{Redemption\ Value}{(1+r)^n}$$

C_n is the future known cash flows (at various future dates) of the bond over "n" years;
PV = Initial value we agree to pay for the Bond or Price of the Bond (all inclusive);
N = number of years 1 to N.

The yield "r" calculated from the above relationship is also known as the "Internal Rate of Return" as this is used to discount all future known cash flows to get the current price of the bond.

Yield to Maturity is a very simple measure and does not take into account the time value of money as it uses the same yield to discount all future cash flows irrespective of their time of arrival. 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. YTM can be calculated iteratively using standard spreadsheet YIELD function available in

MS Excel. There are various calculators and software's available that provide YTM or yield as an inbuilt function.

1.10.2.3 Yield for Money Market

Money market instruments are short-term instruments which mature within a year. Yield measures for money market instruments are annualized but not compounded as there is only a single cash flow till maturity in general. These instruments have different maturity periods and hence for the estimation of the yield, money market instruments need to be converted to a common basis. Such yield is also known as B*ond Equivalent Yield* (BEY). This can be understood better with the following example for estimation of a T-Bill's yield. Treasury Bills (T-bills) are money market instruments to finance the short term requirements of the Government of India. These are discounted securities and thus are issued at a discount to face value and redeemed at par (₹100). The return to the investor is the difference between the maturity value and issue price. The Bond Equivalent Yield (BEY) of Treasury bill is calculated using this formula:

$$\text{BEY} = \frac{\text{Face Value} - \text{Price}}{\text{Price}} * \frac{365}{\text{Days to maturity}} * 100$$

This uses Actual/365 day count convention as prevalent in Indian Money Market.

Example: T-Bills maturing on November 25, 2021, is trading at Rs 99.6898 with value date October 22, 2021.

The yield of this T-Bill is 3.34% [= {(100-99.6898)/99.6898}*(365/34)].
The similar methodology is used to compute yield of money market instruments such as Commercial paper and Certificate of Deposits.

Discount Yield:

Discount yield computes the expected return of a bond purchased at a discount and held until maturity. Discount yield formula uses a 30-day month and 360-day year to simplify the calculation. Discount yield is important for trading in 91-day T-Bills Futures.

Discount Yield = (Face value – Price) * 360 / (Face Value * Days to maturity)

1.10.2.4 Effective Yield

Deposit taking institutions (like banks) often quote two interest rates when they advertise interest rate on various products they are selling. The first is the actual annualized interest rate known as nominal rate or stated rate. The second rate is an equivalent rate which produces same final amount at the end of 1 year if simple interest is applied. This is called the "effective yield". A nominal interest rate of r per annum, compounded m times per year, is equivalent to an effective annual yield of:

$$Y = (1 + \frac{r}{m})^m - 1.$$

For example, a bond paying 4.20% annual coupon would be worth 4.28%, if coupon is paid every month. [= (1+0.042/12)^12 - 1 = 0.042818 = 4.28%].

Point to note that multiplying semi-annual yield by 2 will give an underestimate of the effective annual yield. The proper way to annualize the semi-annual yield is by applying the following formula:

$$Effective\ Annual\ Yield = (1 + periodic\ interest\ \ rate)^n - 1$$

For a semi-annual- pay bond, the formula can be modified as follows:

$$Effective\ Annual\ Yield = (1 + semi\ \ annual\ interest\ \ rate)^2 - 1$$

Similarly, semi-annual yield is:

$$Semiannual\ Yield = 2 * ((1 + Annual\ \ Interest\ rate)^{\frac{1}{2}} - 1)$$

1.11 Determining Cash Flow, Yield and Price of Bonds

A bond is valued using known future cash flows. The future cash flows are calculated using the promised coupon on the Principal. We will use the above equation to price a bond. Let us assume an annual coupon paying bond with 10% interest rate promised at the time of issuance with a residual maturity of 5 years from today. Let us also assume that similar types of securities are available in the market at the yield or market interest rate of 8%. Now we have to find the cash flows, discount factors and ultimately the price of the bond assuming a face value or par value of ₹100.

The cash flows are: Yearly ₹10 for the next 5 years and at the time of maturity, we get back ₹100 along with the last coupon. Now the Year 1 Discount Factor would be $\frac{1}{(1+8\%)^1} = 0.9259$. This means ₹1 to be received after 1 year from now would be valued ₹0.9259 today with 8% current interest rate. The same way we compute Discount Factors as follows:

Year	Discount factors using 8% Yield
1	0.9259
2	0.8573
3	0.7938
4	0.7350
5	0.6806

The Cash flows to be received in future years would be as follows along with their respective Present value using the present yield of 8% for such investment:

Year	Discount factors using 8% Yield (DF)	Cash flows (₹)	Value = DF * Cash flow (₹)
1	0.9259	10	9.2593
2	0.8573	10	8.5734
3	0.7938	10	7.9383

Year	Discount factors using 8% Yield (DF)	Cash flows (₹)	Value = DF * Cash flow (₹)
4	0.7350	10	7.3503
5	0.6806	110	74.8642

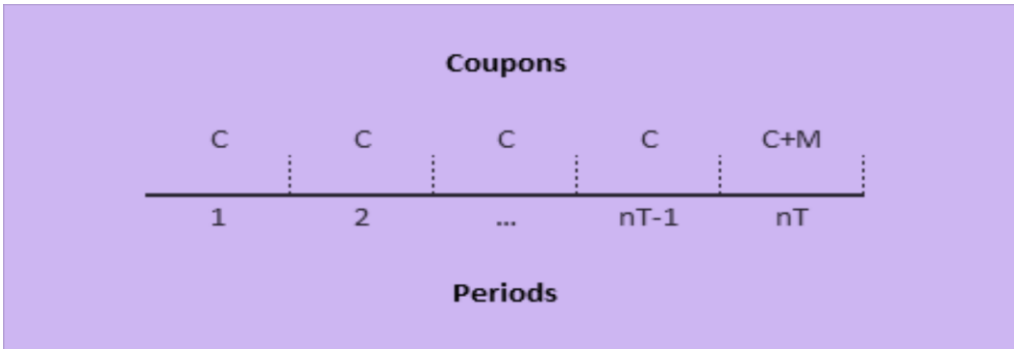
Now the value of the bond in our example would be sum of all discounted value of future cash flows as given in the above table. The same would work out as follows:

Year	Discount factors using 8% Yield (DF)	Cash flows (₹)	Value = DF * Cash flow (₹)
1	0.9259	10	9.2593
2	0.8573	10	8.5734
3	0.7938	10	7.9383
4	0.7350	10	7.3503
5	0.6806	110	74.8642
	3.9927		**107.9854**

The sum of all Discount Factors (3.9927) in this case would be known as PVIF or Present value interest factor. This 3.9927 is arrived using (8%,5) with annual cash flows. We can use the above PFIV to calculate the bond as follows:

Value = (Annual Coupon cash flow * PVIF) + (Par value or Face value or Redemption Value * PV of last maturity)
Or, Value of the Bond with 10% Coupon with 5 years maturity and present yield of 8% = (10*3.9927) + (100*0.6806) = 39.9270 + 68.0600 = ₹107.9870.

Consider a bond paying coupons with frequency n maturing in year T. The cash flows associated with the bond are coupon C paid with frequency n up to year T, plus the principal M, paid at T.



We can use the same bond price equation to describe the value of a semi-annual coupon paying bond (n = 2 in this case). If the bond is paying coupon (of 10% p.a.) twice in a year, then the investor will receive only ₹5 (i.e., half of ₹10) every 6 months and the same can be reinvested at the current market interest rate of 8% p.a.

Valuation of bonds with semi-annual compounding is given in the table below:

Year	Discount Factors using 8% Yield (DF)	Cash flows (₹)	Value = Cash Flow * DF (₹)
0.5	0.961538462	5	4.8077
1.0	0.924556213	5	4.6228
1.5	0.888996359	5	4.4450
2.0	0.854804191	5	4.2740
2.5	0.821927107	5	4.1096
3.0	0.790314526	5	3.9516
3.5	0.759917813	5	3.7996
4.0	0.730690205	5	3.6535
4.5	0.702586736	5	3.5129
5.0	0.675564169	105	70.9342
SUM of DF	**8.110895779**	**Total Value**	**108.1109**

The Discount Factor for the first period is calculated as $\frac{1}{(1+4\%)^{2*0.5}}$ = 0.9615 ($\frac{1}{(1+r/2\%)^{2*n}}$)

The bond can be valued as: (coupon * PVIF) + (face value * DF for the maturity year). The same would be: (5*8.1109) + (100*0.675564) = 40.5545 + 67.5564 = ₹108.1109. The semi-annual coupon paying bond is valued more at 108.1109 than the annual coupon paying bond at 107.9870 with similar maturity, yield and coupon rate. This is due to the greater frequency of compounding in case of semi-annual bond**.**

The valuation rule for valuing semi-annual bonds can be extended to valuing bonds paying interest more frequently – like once in a quarter. Hence, if "n" is the frequency of payments per year, "t" the maturity in years, and, as before, R the present interest quoted on an annual basis, then the formula for valuing the bond would be:

$$V = \sum_{t=1}^{n*t} \frac{(\frac{C}{n})}{\left((1+\frac{R\%}{n})^{n*t}\right)} + \frac{\text{Face Value}}{(1+\frac{R\%}{n})^{n*t}}$$

When n becomes very large, this approaches continuous compounding wherein the investment earns and reinvests interest at all points in time, rather than at specified intervals. However, in practice, continuous compounding gives a marginally higher interest than daily compounding and having an infinite number of periods may not be feasible.

1.11.1 Valuing Bonds with Maturities Less Than One Year

If a bond matures before one coupon cycle (typically a Treasury bill), then the value of the bond would be calculated as:

$$V = \frac{Face\ Value}{(1+R\% * \frac{n}{365})}$$

This formula would calculate n as the difference between the maturity date and the date of buying the bond.

1.11.2 Valuing Zero Coupon Bond

If we have a zero coupon paper higher than one year or one coupon cycle, we can calculate the bond equivalent yield price:

$$V = \frac{\text{Face Value}}{(1 + \frac{R\%}{n})^{n*t}}$$

For semi-annual yield, n will equal to 2.

$$V = \frac{Face\ Value}{(1 + R\%/2)\text{^}(2 * time)}$$

If we want to calculate the annual bond equivalent yield, the R% would not be divided by 2 and the time would not be multiplied by 2. Time will be number of years to maturity.

1.11.3 Valuing Bonds at Non-Coupon Dates

The Dirty Price is nothing but the Present Value of the Bond. The Present value is further bifurcated into Clean Price and Accrued Interest. Bonds are generally valued in between coupon dates when they are traded. Hence the concept of Clean price and Dirty price has to be established. The dirty price is the sum of clean price and the interest accrued on the bond since the last coupon payment date.
Dirty Price = Clean Price + Accrued Interest

In order to price a bond in between coupon days, the following principles are followed.

1. Take the settlement date (buying date) to the previous coupon date and value the bond using the coupon, yield and the residual maturity from the last coupon date.
2. Bring the said price or value to the future date (settlement date or buying date) with a Future Value Factor.
3. Deduct the accrued interest from the total value to arrive at the clean price or trade price or invoice price.

Example:
Trade value (Settlement) date: 12-Aug-2020
Maturity date: 11-May-2030
Coupon: 5.79%
Present yield: 5.90%.
The bond pays semi-annual coupon.
The market convention for day count is “30/360 European” (i.e., every month is 30 days and year is 360 days).

Last coupon Date = 11-May-2020
Time from 11-May-2020 to 11-May-2030 = 10 years

Time between Last coupon date (11-May-2020) and Settlement date (12-Aug-2020) = 91 days = 91/360 years = 0.252778 years (using 30/360E day count rule). Now for 91 days, the accrued interest will be:

$$\text{Accrued Interest} = 5.79 * \left(\frac{91}{360}\right) = ₹1.4636$$

This bond would be quoted and traded at a clean price of ₹99.1828 and will be settled at the Dirty Price of ₹100.6464. The same value can be arrived at using every stage cash flow discounting, as shown below:

Cash Flow date (CFD)	Cash Flow in Rs.	Difference in CFD and Settlement Date in terms of year	DF @5.90%	D Value = CF*DF
11-Nov-20	2.895	0.2472	0.9857	2.8537
11-May-21	2.895	0.7472	0.9575	2.7719
11-Nov-21	2.895	1.2472	0.9300	2.6925
11-May-22	2.895	1.7472	0.9034	2.6153
11-Nov-22	2.895	2.2472	0.8775	2.5404
11-May-23	2.895	2.7472	0.8524	2.4676
11-Nov-23	2.895	3.2472	0.8279	2.3969
11-May-24	2.895	3.7472	0.8042	2.3282
11-Nov-24	2.895	4.2472	0.7812	2.2615
11-May-25	2.895	4.7472	0.7588	2.1967
11-Nov-25	2.895	5.2472	0.7370	2.1337
11-May-26	2.895	5.7472	0.7159	2.0726
11-Nov-26	2.895	6.2472	0.6954	2.0132
11-May-27	2.895	6.7472	0.6755	1.9555
11-Nov-27	2.895	7.2472	0.6561	1.8995
11-May-28	2.895	7.7472	0.6373	1.8451
11-Nov-28	2.895	8.2472	0.6191	1.7922
11-May-29	2.895	8.7472	0.6013	1.7408
11-Nov-29	2.895	9.2472	0.5841	1.6910
11-May-30	102.895	9.7472	0.5674	58.3782
		SUM	15.16779	**100.6464**

Deducting accrued interest from the dirty price will provide the clean price of the bond. Therefore, clean price of this bond would be: ₹100.6464 – ₹1.4636 = ₹99.1828.

1.11.4 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. It is also called "zero rate" because it can be readily computed from the market price of zero-coupon bond.

Since the zero rate (Z) is the true return, the present-value of any future cash flow will be its discounted value, the discounting being at the zero rate relevant to the timing of the cash flow. Bond (or any financial instrument) is a set of cash flows occurring at different times during its life. The current market price of bond should be its cash flows discounted at the appropriate zero rates from the prevailing term structure of zero rates. Consider the earlier 3Y 8% coupon bond. The current market price of the bond should be:

$$\text{Price} = \frac{8}{(1+Z_1)^1} + \frac{8}{(1+Z_2)^2} + \frac{108}{(1+Z_3)^3}$$

where Z_i is the zero rate for the *i*th year. For the above example, what is the true return? The answer is that there is no single answer but there are three answers. For the first year, the return is Z_1 on a final amount of 8; for the second year, Z_2 on a final amount of 8; and for the third year, Z_3 on a final amount of 108. Assuming that the term structure of zero rates is 7.75%, 8.00% and 8.25%, respectively, for the first, second and third years, the market price of the bond will be as follows:

Year	Zero rate (Z)	Cash flow	Discounted value
1	7.75%	8	$8 / (1.075^1) = 7.4246$
2	8.00%	8	$8 / (1.08^2) = 6.8587$
3	8.25%	108	$108 / (1.0825^3) = 85.1413$
		Total	**99.4246**

The above brings in two important facts.

- First, the bond price is determined, not by demand-supply for bond, but by term structure of zero rates. It should be noted that the demand-supply forces do have a play, but that is demand-supply for money, not for bond. The demand-supply for money determines the zero rates, which in turn determine the bond price.
- Second, in a coupon bond (or annuity), there is no single return measure but multiple of them.

In the above example, the return is 7.75% for one year for a final amount of 8; 8% for two years for a final amount of 8; and 8.25% for three years for a final amount of 108. The interpretation of 2Y zero rate of 8% means this: you earn 8% for one year, which will be automatically reinvested at the same 8% for one more year. Similarly, the 3Y zero rate of 8.25% implies that in the first year, the return is 8.25%, which is reinvested at the same rate for two more years; and in the second year, the return is the same 8.25%, which is reinvested for one more year at the same rate. If there is a 10Y coupon bond with semi-annual payment, there will be 20 different return measures, each corresponding to the cash flows. To make it easier for interpretation, we average all the rates into a single

number, which is called YTM. For the earlier 3Y 8% coupon bond, the YTM is derived from the bond price as follows:

$$99.4246 = \frac{8}{(1+YTM)^1} + \frac{8}{(1+YTM)^2} + \frac{108}{(1+YTM)^3}$$

It can be solved through trial-and-error method by starting at a guess rate and progressively increasing or decreasing it. For the above example, YTM has to be 8.2241% for the above equation to be satisfied.

The above shows that YTM is not a return measure but another way of quoting bond price (because it is derived from bond price). Alternately, given YTM, the bond price can be derived from the above equation. Both bond price and its variant of YTM cannot be used as judgment tools to determine the mispricing, as shown by the following example. There are two bonds issued by the same issuer and with the same maturity of 3Y. One bond has a coupon of 8% and the other 9%. The market prices of these bonds, given the following term structure of zero rates, and the translation of price into YTM will be as follows:

Year	Zero Rate	Bond A		Bond B	
		Coupon	Disc Amount	Coupon	Disc Amount
1	7.7500%	8	7.4246	9	8.3527
2	8.0000%	8	6.8587	9	7.7160
3	8.2500%	108	85.1413	109	85.9296
Total			99.4246		101.9983
YTM			**8.2941%**		**8.2215%**

Both bonds have the same maturity and issued by the same issuer. Therefore, maturity-related price risk and issuer-related credit risk are the same for both bonds. Which bond is better? Bond A would seem under-priced at 99.4246 and Bond B would seem overpriced at 101.9983. However, this is incorrect because we are comparing apples with oranges. Both bonds are priced correctly at the same term structure of zero rates. The price cannot be used as a judgment tool for determining the mis-pricing. Since YTM is another way of quoting price, it cannot be used as judgment tool, too. Only if the actual market price of the bonds is different from 99.4246 (for Bond A) and 101.9983 (for Bond B), we can say that there is a mispricing or cheapness/richness of bonds.

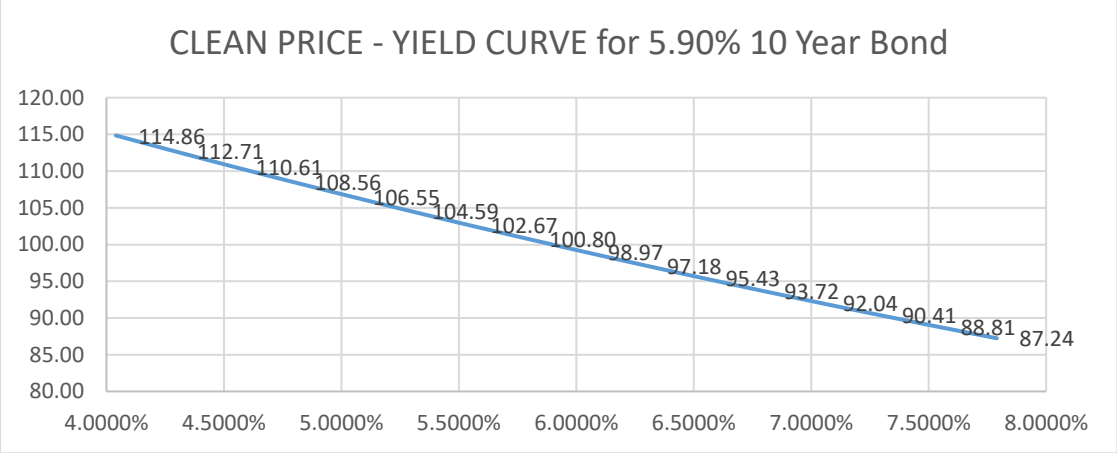
Investor may still have preference for the bonds, which is decided by factors other than price or YTM. These factors are tax considerations and expectations about future interest rates for reinvestment. If you expect interest rate would rise in future, then you may prefer Bond B because higher amount of Rs 9 will be reinvested at higher rate. Similarly, if capital gains are taxed at lower rate than income, then investor will prefer Bond A because it has lower income of Rs 8 a year and a capital gain at redemption.

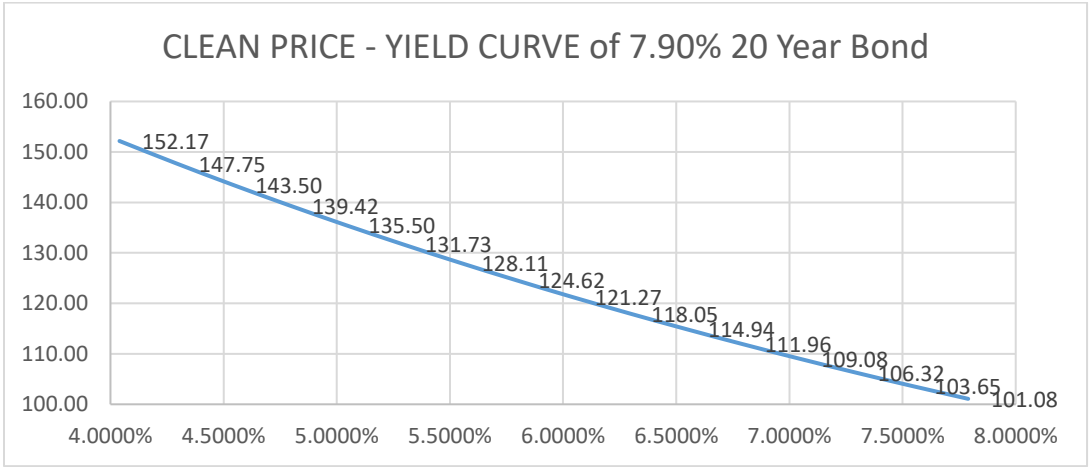
To sum up, the following are the drawbacks in using YTM as a true return measure:

- By using the same rate for all cash flows, it assumes that the term structure of zero rates is flat, which is inconsistent with reality.
- Bond with different coupons but with same maturity will have different YTMs (which is called "coupon effect"). In other words, YTM is inconsistent because it simultaneously assumes different levels of term structure of zero rates at the same time. In the above example, YTM assumes that term structure of zero rates is flat at 8.2941% for Bond A and 8.2215% for Bond B, whereas the actual rates are 7.75%, 8% and 8.25% for 1Y, 2Y and 3Y, respectively.
- YTM is inconsistent in another way: it assumes different reinvestment rates simultaneously. In the above example, it assumes the reinvestment rate to be 8.2941% for Bond A and 8.2215% for Bond B, while the actual investment rates are unknown.

1.11.5 Price-Yield Relationship

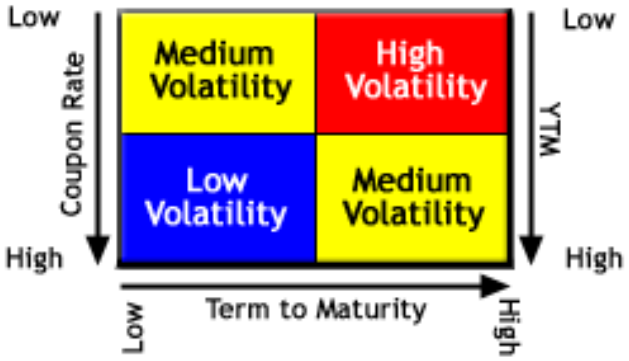
The price-yield relationship is inverse in nature. When we calculate the relationship, we use only the clean price. If we want to plot the price-yield relationship of two bonds, we can compare their relative effective riskiness.





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

1. The inverse relation between a bond's price and rate of return (yield) is given by the negative slope of the price-yield curve. The movement across the curve is non-linear.
2. If the coupon rate and the bond initial price are constant, the bond with a longer term to maturity will display higher price volatility and a bond with a shorter term to maturity will display lower price volatility.
3. If term to maturity and a bond's initial price remain constant, the higher the coupon, the lower the volatility, and the lower the coupon, the higher the volatility.
4. A bond with a high yield to maturity will display lower price volatility than a bond with a lower yield to maturity, but a similar coupon rate and term to maturity.



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

Bonds can trade at par when the coupon and yield are same. But, if the coupon is lower than the current market yield, then the bond would be trading at discount. If the coupon is higher than the current market yield, it would be trading at premium.

Bond-Price Relation 1:	if $C^R = R \Rightarrow V_o^b$ = F: Bond valued at par. if $C^R < R \Rightarrow V_o^b <$ F: Bond valued at discount. 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				
Par	CR	=	CY	=	YTM
Discount	CR	<	CY	<	YTM
Premium	CR	>	CY	>	YTM

When the required rate increases, the price of the bond falls as can be seen in the table:

PRICE-YIELD RELATION

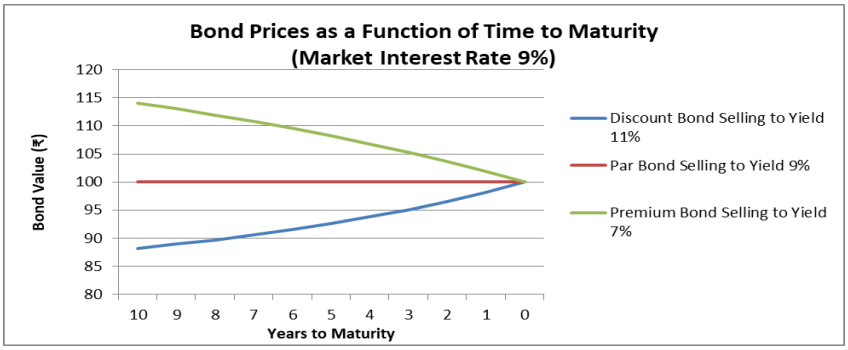
10-Year, 9% Annual Coupon Bond

Required Rate	Bond Value (₹)	Changes in Bond Value (₹)
5%	130.89	
6%	122.08	-8.807
7%	114.05	-8.032
8%	106.71	-7.337
9%	100.00	-6.710
10%	93.855	-6.145
11%	88.222	-5.633
12%	83.049	-5.173
13%	78.295	-4.754

1.11.7 Price Time Path of a Bond

The Value Over Time of an Original 10-Year, 9% Annual Coupon Bond Selling at Par, at Discount, and at Premium:

	Discount Bond	Par Bond	Premium Bond
	Price of Bond (₹)	Price of Bond (₹)	Price of Bond (₹)
Year	Selling to Yield 11%	Selling to Yield 9%	Selling to Yield 7%
10	88.2220	100.00	114.05
9	88.9260	100.00	113.03
8	89.7080	100.00	111.94
7	90.5760	100.00	110.75
6	91.5390	100.00	109.53
5	92.6080	100.00	108.20
4	93.7950	100.00	106.77
3	95.1130	100.00	105.25
2	96.5750	100.00	103.62
1	98.1980	100.00	101.87
0	100.0000	100.00	100.00



The price path of a bond tells us the importance of "Pulled to Par" concept. Pull to par is the movement of a bond's price toward its face value as it approaches its maturity date. Premium bonds, which trade at a higher price than their face (par) value, will decrease in price as they approach maturity. Discount bonds, which trade at a lower price than their par value, will increase in price as they approach maturity.

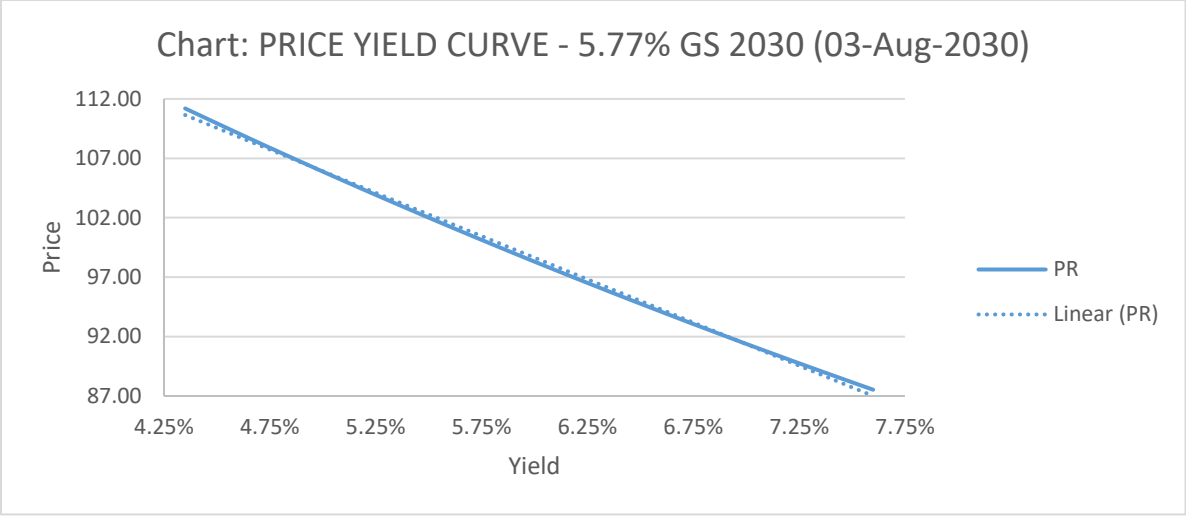
1.12 Risk Measures

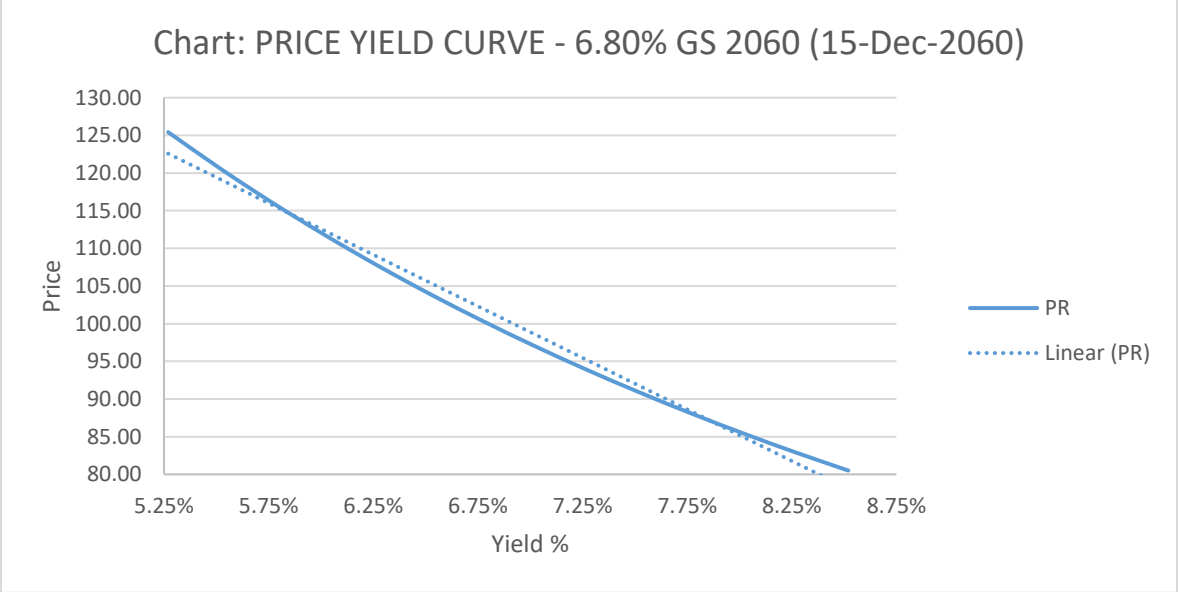
In earlier sections, we have discussed about various risks associated with Fixed Income Securities. If the issuer is a sovereign government, there will be no credit risk because government will not default in its own currency. If the bond is held until maturity, there will be no price risk, liquidity risk because of "pull-to-par" effect of bond price at maturity. If the bond is a zero-coupon bond, there will be no reinvestment risk because there are no interim cash flows to be reinvested until maturity. Since most bonds are issued by non-sovereign issuers and are coupon bonds, all these risks are present in the bond. We will consider only risk associated with change in interest rate and ignore all other risk.

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. The bond price falls because of discounting at a higher interest rate results in lower present value; and reinvestment income rises because the interim cash flows are reinvested at higher than the original interest rate. 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.

1.12.1 Price Volatility Characteristics of Option Free Fixed Income Securities

Interest rate risk can be defined as the change in the price or value of the bond with respect to the change in market interest rates. 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. Understanding price volatility is the key to the risk management of fixed income securities. Below chart and table depicts the Price-Yield relationship for two bonds of 2030 and 2060 maturity and the same would be used by us to understand the price sensitivity of bonds for value dated 26-Oct-2020.





For same change in yield (25 bps), the change in price is different for these two bonds

Table: Price sensitivity of Short duration and Long duration bonds (Clean Price)	
25 bps Delta Price 2030 starting with yield of 4.35% to 7.60%	**25 bps Delta Price 2060 starting with Yield of 5.27% to 8.52%**
2.08	4.85
2.03	4.55
1.99	4.27
1.94	4.02
1.90	3.78
1.86	3.56
1.81	3.35
1.77	3.16

Table: Price sensitivity of Short duration and Long duration bonds (Clean Price)	
25 bps Delta Price 2030 starting with yield of 4.35% to 7.60%	**25 bps Delta Price 2060 starting with Yield of 5.27% to 8.52%**
1.73	2.98
1.69	2.82
1.66	2.67
1.62	2.52
1.58	2.39

This may show that price changes for small changes in yield are not likely to be the same across the curve. A longer bond is expected to have higher price sensitivity compared to a short duration bond.

In order to explain the risk of a bond price from interest rate changes, we will once again use another example.

Table: Price sensitivity for 5.79% GS 2030 at 25 bps and 50 bps shock to yield (Clean Price)							
YLD-1	**PRICE 1**	**CH25 %DOWN**	**CH25 %UP**	**YLD-2**	**PRICE 2**	**CH50 %DOWN**	**CH50 %UP**
4.08%	113.7440		1.93%	2.33%	130.2774		3.99%
4.33%	111.5951	-1.89%	1.92%	2.83%	125.2735	-3.84%	3.96%
4.58%	109.4955	-1.88%	1.91%	3.33%	120.4993	-3.81%	3.93%
4.83%	107.4439	-1.87%	1.90%	3.83%	115.9435	-3.78%	3.90%
5.08%	105.4392	-1.87%	1.89%	4.33%	111.5951	-3.75%	3.86%
5.33%	103.4802	-1.86%	1.88%	4.83%	107.4439	-3.72%	3.83%
5.58%	101.5657	-1.85%	1.88%	5.33%	103.4802	-3.69%	3.80%
5.83%	99.6947	-1.84%	1.87%	5.83%	99.6947	-3.66%	3.76%
6.08%	97.8660	-1.83%	1.86%	6.33%	96.0786	-3.63%	3.73%
6.33%	96.0786	-1.83%	1.85%	6.83%	92.6237	-3.60%	3.70%
6.58%	94.3315	-1.82%	1.84%	7.33%	89.3221	-3.56%	3.66%
6.83%	92.6237	-1.81%	1.84%	7.83%	86.1663	-3.53%	3.63%
7.08%	90.9542	-1.80%	1.83%	8.33%	83.1494	-3.50%	3.59%
7.33%	89.3221	-1.79%	1.82%	8.83%	80.2645	-3.47%	3.56%
7.58%	87.7264	-1.79%		9.33%	77.5053	-3.44%	
STDEV		0.0331%	0.0343%		STDEV	0.13%	0.14%

This table shows that for small changes in the yield, the risk is lower while a large yield change results into higher volatility in prices. It also shows that price change is not same when yield decreases vs. when it increases. Price decreases by 1.89% when yield increases by 25 bps (i.e., from 4.08% to 4.33%) vs. price increases by 1.93% when yield decreases by 25 bps (i.e., from 4.33% to 4.08%).

For a change of 25 bps in yield, we have generated the price changes and we can see the volatility level is different against the changes of 50 bps for the same bond. The volatility measured by standard deviation of price changes for 25 bps change in yield is 0.03% but for change in 50 bps in yield, the said standard deviation is about 4 times higher.

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. For example, if we consider 5.79% GS 2030 bond as given in the prior example, when yield increases from 4.08% to 4.33%, the price drops by 1.89% but if we take another bond with the same maturity year except 8.5% coupon (8.50% GS 2030), the price drop is 1.76% when yield increases from 4.08% to 4.33%.

(ii) When yield changes are very small (say 1-2 bps), 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 (say more than 20 bps viz. 100-200 bps), 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. For example, for a 5.79% GS 2030, when yield rises from 5.08% to 6.08%, the change is price in opposite direction is 7.18% but when the yield drops from 5.08% to 4.08%, the price changes in opposite direction by 7.88%. This means, the losses due to increase in yield is less than the profit due to drop in yield for a bond even when we change the yield by the same level. These properties can be best explained using the Price-Yield curve that is convex in nature. The convexity shape of the price-yield relationship explains the difference in price changes depending on the zone of yield movement.

1.12.2 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. For understanding Duration, we need to understand the Price-Yield curve. The Price-Yield curve depicts the relative volatility or sensitivity of the bond across various yields surface. A Price-Yield curve is a simple depiction of price and yield relationship on a two-dimensional surface. Price and Yield are inversely related.

1.12.3 Macaulay Duration

Macaulay duration 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. Macaulay duration of a bond is influenced by the bond's coupon rate, term to maturity, and yield to maturity. With all the other factors constant, a bond with a longer term to maturity will have a greater Macaulay duration, as it takes a longer period to receive the principal payment at the maturity. Macaulay duration will decrease as time passes (term to maturity reduces). Macaulay duration is inversely related to the coupon rate. The greater the coupon payments, the lower the Macaulay duration. This is because we receive larger cash amounts (when discounted) in the early periods. A zero-coupon bond assumes the highest Macaulay duration compared with coupon bonds, assuming other features are the same. It is equal to the maturity for a zero-coupon bond and is less than the maturity for coupon bonds. Macaulay duration is also inversely related to the yield to maturity. A bond with a higher yield to maturity shows a lower Macaulay duration.

Duration (also called Macaulay duration) can be adjusted to provide us a measure of interest rate risk exposure that measures the bond's weighted average maturity. It tells us how long it would take to recover our investment and can be compared with other bonds to rank them in terms of their effective pay back periods. The weighted average maturity changes with yield changes. If interest rate increases (yield rises), the payback period comes down and vice versa. For example, the semi-annual coupon paying bond 5.77% GS 2030 (maturity 03-Aug-2030) will have a payback period of 7.50 years as on 26-Oct-2020 when the yield is 5.85%. If the yield changes to 6.50% and all other things remain the same, the payback period drops to 7.43 years.

Hence, Duration in simple terms is a measure of average time to receive all the future cash flows that will make the Present value of the said future cash flows to current market price. Zero coupon bonds will have no intervening cash flows and hence the duration and maturity would be the same.

Duration does not increase exponentially with increase in maturity of a bond and stagnates after a maturity level is reached.

Table: Duration of Bonds with various Maturities

Settlement Date	Coupon	Maturity	Yield	Duration
26-Oct-20	5.77%	03-Aug-30	5.85%	7.50
26-Oct-20	5.77%	03-Aug-60	6.50%	14.67
26-Oct-20	5.77%	03-Aug-90	6.80%	14.93

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

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

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

where:
Mac Duration = duration of the bond;
CF_t= cashflow at time t;
t = time period of the cashflow;
C = periodic coupon payment;
M = maturity value;
n = number of periods to maturity;
Y = the yield to maturity (market interest rate).

Table: DURATION Calculation using Spreadsheet

Settlement Date	Next Cashflow Date	Cashflow	Time (Years)	Discount Factor	Discounted Cashflow	Weighted Discounted Cashflow
A	B	C	D	E	F=C*E	G=F*D
07-Jul-20	11-Nov-20	2.895	0.3444	0.9804	2.8383	0.9776
	11-May-21	2.895	0.8444	0.9526	2.7579	2.3289
	11-Nov-21	2.895	1.3444	0.9256	2.6798	3.6028
	11-May-22	2.895	1.8444	0.8994	2.6039	4.8027
	11-Nov-22	2.895	2.3444	0.8740	2.5301	5.9317
	11-May-23	2.895	2.8444	0.8492	2.4584	6.9929
	11-Nov-23	2.895	3.3444	0.8251	2.3888	7.9892
	11-May-24	2.895	3.8444	0.8018	2.3211	8.9235
	11-Nov-24	2.895	4.3444	0.7791	2.2554	9.7984
	11-May-25	2.895	4.8444	0.7570	2.1915	10.6167
	11-Nov-25	2.895	5.3444	0.7356	2.1294	11.3807
	11-May-26	2.895	5.8444	0.7147	2.0691	12.0929
	11-Nov-26	2.895	6.3444	0.6945	2.0105	12.7556
	11-May-27	2.895	6.8444	0.6748	1.9536	13.3711
	11-Nov-27	2.895	7.3444	0.6557	1.8982	13.9415
	11-May-28	2.895	7.8444	0.6371	1.8445	14.4689
	11-Nov-28	2.895	8.3444	0.6191	1.7922	14.9551
	11-May-29	2.895	8.8444	0.6015	1.7415	15.4023
	11-Nov-29	2.895	9.3444	0.5845	1.6921	15.8121
	11-May-30	102.895	9.8444	0.5679	58.4390	575.2997
				DP (SUM)	100.5953	761.4442
				Duration		7.5694
				Formula	761.4442/100.5953	

1.12.4 Use of duration

The duration-price sensitivity or elasticity depends on the maturity, coupon, and yield to maturity. All other things being equal, the longer maturity bonds are likely to have greater duration.

Higher coupon bonds are likely to have smaller duration as larger part of the cash flows will be received in early stages. Coupon payments cause weight to be put on the early years in the duration formula.

Third, duration decreases with increases in YTM. This occurs because an increase in the yield (interest rate) has a greater damping effect on the present value of a distant coupon than on the present value of a nearby coupon.

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 of the bond.
- YTM (yield to maturity) is inversely related to duration. Higher yield means 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.

1.12.5 Portfolio Duration

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

$$DUR_{Portfolio} = \sum w_i \, DUR_i$$

Duration of a portfolio of two assets is their weighted average of Durations. If the portfolio was 30% invested in an asset with a 3-year duration and 70% invested in an asset with a 5-year duration, the duration of the two assets would be 0.3 * 3 + 0.7 * 5 = 4.40 years. Hence, duration of portfolio is 4.40 years.

1.12.6 Modified Duration and Interest Rate Sensitivity Approximation

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. It is the value by which the dirty price changes when the yield changes by 100 basis points. To find the modified duration, all an investor needs to do is take the Macaulay duration and divide it by 1 + (yield-to-maturity / number of coupon periods per year).

$$\text{Modified Duration} = \frac{\text{Macaulay Duration}}{(1 + \text{YTM} / \text{n})}$$

Modified Duration example:
For the earlier example, DUR was 5.34.
The Modified Duration would be 5.34/(1+4.5%) = 5.11.
This means if the interest rate or the yield changes by 100 basis point, the bond price is likely to change by 5.11% in opposite direction. If the bond is semi-annual coupon paying bond, the Modified Duration would be 5.34/(1+4.5%/2)= 5.22**.**

Percentage Change in Bond Price = - Modified Duration × Change in Yield

To find the effect of modified duration on a bond's price, you should use the dirty price because the dirty price represents the total amount paid by the investor and reflects the bond's true market value including accrued interest, which is essential for an accurate price-yield relationship. Modified duration measures how much the total purchase price (the dirty price) of a bond changes for a given change in its yield.

It may be noted that for small changes in interest rates, the approximation produced is likely to be reasonably accurate, but for large changes this may not be true. This is because Modified Duration based price change follows linear relationship and it works well when the rate change is small. Price-Yield relationship being non-linear, large rate changes always produces smaller price changes using Duration based approach. Bond Convexity fixes this mismatch.

1.12.7 Price Value of Basis Point (PV01)

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%). If the change in price is 0.05 (=100-99.95) for 1 bps change in yield, then intuitively, the PV01 is Rs 0.05 or 5 paise for this bond. The PV01 or PVBP is given in terms of modified duration as well. The formula is:
PV01 = .01 * Modified Duration/100 * Bond Price = (Bond price * Modified Duration) / 10000
PV01 = (Dirty Price * Modified Duration) / 10000.
Here the dirty price is used as we need to understand the full value change in bond for one unit change in yield.

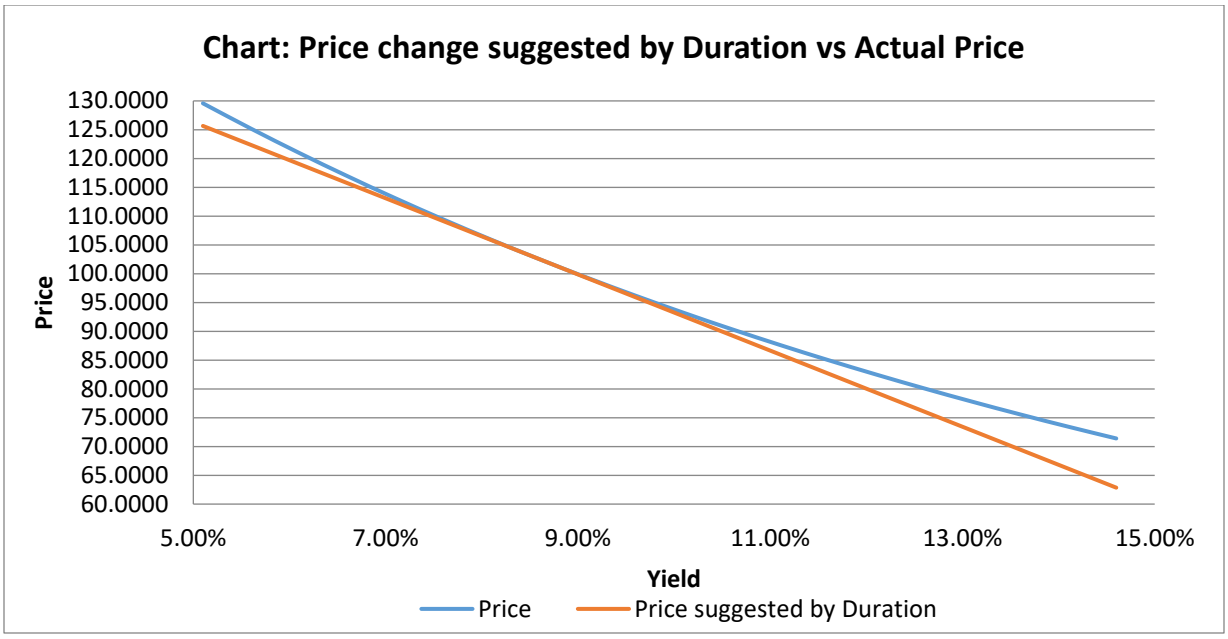
1.12.8 Convexity Measure

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. Duration can approximate price changes, if the yield changes are small; but when the yield changes are large, the duration does not approximate the price changes accurately. This is so because of bonds have different degree of convex shapes. When considering moderate or large changes in interest rates, a factor known as convexity is important. That is, duration

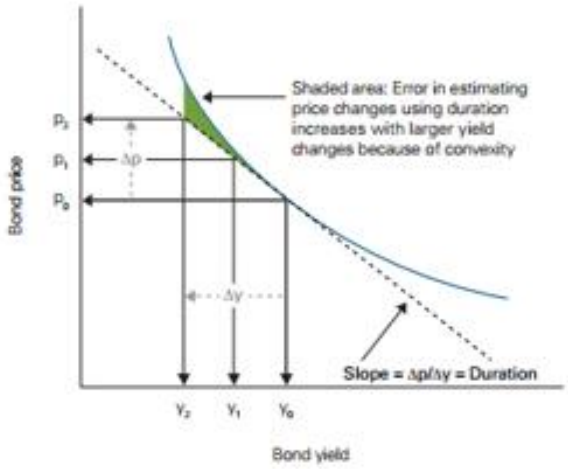
attempts to estimate a convex relationship with a straight line (the tangent line). The above can be explained with the example of our Bond.

Table: Interest Rate or Yield Shock to a Bond and Modified Duration			
Interest Rate Shock	**Actual Price Change**	**Price Change Implied by MD**	**Difference (Error)**
0.10%	-0.6421	-0.6610	0.0189
-0.10%	0.6477	0.6610	0.0134
0.20%	-1.2787	-1.3221	0.0434
-0.20%	1.3009	1.3221	0.0211
0.30%	-1.9099	-1.9831	0.0733
-0.30%	1.9599	1.9831	0.0232
0.40%	-2.5356	-2.6442	0.1085
-0.40%	2.6246	2.6442	0.0196
0.50%	-3.1560	-3.3052	0.1492
-0.50%	3.2950	3.3052	0.0102
0.60%	-3.7712	-3.9663	0.1951
-0.60%	3.9713	3.9663	-0.0050
0.70%	-4.3810	-4.6273	0.2463
-0.70%	4.6534	4.6273	-0.0261
0.80%	-4.9857	-5.2884	0.3027
-0.80%	5.3416	5.2884	-0.0532
0.90%	-5.5852	-5.9494	0.3642
-0.90%	6.0357	5.9494	-0.0863
1.00%	-6.1797	-6.6105	0.4308
-1.00%	6.7359	6.6105	-0.1254
1.50%	-9.0771	-9.9157	0.8385
-1.50%	10.3298	9.9157	-0.4142
2.00%	-11.8543	-13.2209	1.3666
-2.00%	14.0846	13.2209	-0.8637

The error in approximating the bond price changes using modified duration gets larger as the interest shocks become larger. Further, the increase in interest rate has a relatively lesser impact on bond price changes that the fall in interest rate. Hence, duration underestimates the price change in case of interest rate fall and over estimates the price change in case of an increase in interest rate.



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. Greater precision in measuring the bond's sensitivity to yield changes can be achieved by taking into account the bond's convexity.



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. Hence this provides a measure of the degree by which a bond's price-yield curve departs from a straight line. This measure provides better estimate of a bond's price volatility. The formula for convexity is a complex one that uses the bond price, yield to maturity, time to maturity and discounted future cash inflow of the bond. The cash inflow includes both coupon payment and the principal received at maturity.

Convexity is measure of the curvature of the price/yield relationship. This is the second partial derivative of the bond valuation equation w.r.t. the yield. Convexity can be calculated using following formula:

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

Where,

P= Bond price

Y= Yield to maturity

T= Maturity in years

CF_t = Cash flow at time t

Convexity example: Assuming a 3-yr Bond, 10% coupon, semi-annual compounding, required yield 9%, convexity can be calculated as:

$$CONV = \frac{\frac{5*1*2}{(1.045)^3} + \frac{5*2*3}{(1.045)^4} + \frac{5*3*4}{(1.045)^5} + \frac{5*4*5}{(1.045)^6} + \frac{5*5*6}{(1.045)^7} + \frac{105*6*7}{(1.045)^8}}{4 * 102.58}$$

$$= 8.2135$$

To make the convexity of semi-annual bond comparable to that of an annual bond, we divide convexity by 4 (=2^2).

As seen in the convexity calculation can be quite tedious and long, especially if the bond is long term and has numerous cash flows. The formula for convexity approximation is as follows:

$$\text{Convexity} = \frac{(P_+) + (P_-) - 2P_0}{2 \times P_0 (\Delta y)^2}$$

P_0 = Bond price.

P_- = Bond price when interest rate is incremented

P_+ = Bond price when interest rate is decremented

Δy = change in yield, in decimal form.

Convexity adjustment formula, is then added to the duration adjustment to calculate bond price change for given change in yield.

Convexity Adjustment= Convexity × 100 × $(\Delta y)^2$

Convexity Relationships

- Coupon is inversely related to convexity. Convexity is high for lower coupon bonds.
- Yield to maturity is inversely related to convexity. Higher Yield means lower convexity.

- Convexity is positively related to maturity of the bond. Higher the maturity, more convex is the Price-Yield curve.
- Portfolio convexity is weighted sum of individual bond's convexity.

1.12.9 Duration and Convexity Effect on the Price Change of a Bond

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

Change in price = Duration effect + Convexity effect

Suppose the yield-to-maturity is expected to fall by 200 bps tomorrow, from 5% to 3%. A bond has an annual (modified) duration of 10.66 and annual convexity of 81.96. What is the percentage price gain from this fall in interest rate?

% Change in price = $\{-10.66*(-0.02)\} + \{100*81.96*(-0.02)^2\}$
% Change in price = 21.32%+3.28% = 24.60% (Estimated price change 24.60% approx.)

In case of yield to maturity is expected to increase by 200 bps then,
% Change in price = $(-10.66*0.020) + \{100*81.96*(0.020)^2\}$
% Change in price = -21.32%+3.28% = -18.04% (Estimated price change -18.04% approx.)

Due to positive convexity, the % increase in bond price is greater than % decrease in bond price for same yield change.

1.13 Role of the Debt Market

Financial markets are grouped into three super asset classes: *underlying, derivative* and *structured finance*. Besides these three, there are *collective investment schemes* (e.g. mutual funds), *physical assets* (e.g. real estate, commodities, art, antiques, wine, etc) and *alternative assets* (e.g. ETFs, managed futures, hedge funds, private equity, etc).

The underlying super asset class consists of fundamental assets and there are four of asset classes: *money, bond, equity* and *forex*. They are fundamental because they are independent. They are also called traditional asset classes because investors have traditionally parked their savings and investments in them. Money and bond markets together can be considered as fixed income securities (FIS) market. A capital market is a financial market in which long-term debt (over a year) or equity-backed securities are bought and sold, in contrast to a money market where short-term fixed income securities are bought and sold. Debt market and equity market together are called capital market because they constitute the two parts of capital of corporate bodies. The derivative super asset class is not independent but derived (hence the name "derivative") from the underlying super asset class. There can be no derivative without underlying.

Economic role of underlying markets is financing, which means transferring cash from those that have to those that need it. The financing is through borrow-lend of cash in money and bond markets (together called debt or fixed-income securities); and through

buy-sell of business ownership in equity market. Forex market traditionally serves the function of production-consumption in international trade but can also be used for financing in the sense one can borrow or lend foreign currency instead of home currency. Economic role of derivative markets is risk management, the risk being the risk present in the underlying from which the derivative is derived. The role of structured finance is financing combined with risk management.

Firms need finance for their day to day operations. Business owners raise finance mostly using debt and equity. "Debt" involves borrowed money to be repaid with interest, while "Equity" involves raising money by selling stake in the company. Debt is a charge on income for the firm, while the return on equity is an allocation / appropriation of profit made by the company. Similarly, governments also borrow so that they can finance spending for development of the society and country. Borrowing at both firm and government levels can be either to fund temporary liquidity shortfall or for funding long-term asset creation. Depending upon the duration and purpose of borrowing, a variety of debt instruments can be used for raising the funds.

The debt market facilitates borrowing of funds using such instruments to investors having varied risk appetite. Inherently, all debt instruments are essentially loans or IOUs, with an undertaking to pay or service regular promised coupon or interest and repay the principal amount borrowed after a specified period as promised at the time of borrowing. As the periodic interest or cash flows are typically fixed and known in advance, these instruments are more popularly referred to as “Fixed Income Securities”. Borrowing money to finance the operations and growth of a business is a kind of leverage the company takes against its equity capital. This way, the owner does not have to give up (or dilute) control of the business, but too much debt can inhibit the growth of the company and many companies have gone bankrupt under the pressure of debt. Hence, a balanced decision on the level of leverage is imperative based on the careful assessment of pros and cons of the available financing avenues.

1.13.1 Importance of Debt Markets

In any economy, the Government generally issues the largest amount of debt to fund its expenditure. A well-developed debt market helps the Government to raise debt at a reasonable cost. A liquid debt market lowers the borrowing cost for all, and it provides greater pricing efficiency. Debt is funded either by bank loans or by bond issuances. A corporate bond market dealing with issuance of pure corporate paper helps an economic entity to raise funds at cheaper cost. The debt market brings together large number of buyers and sellers to price the debt instruments efficiently. A well-developed debt market reduces degree of banking support for the economy, as risk is distributed among many investors. A well-developed debt market helps the banking system with better Asset-Liability Management. The development of a well-functioning debt market helps to channelize the collective investment schemes to invest in the market and also facilitate in bringing retail investors to invest directly in debt. The well developed and liquid debt market also helps various long term investors like pension funds, insurance companies

which have different investment objectives, as they invest for very long term, to match and immunize their liabilities.

The primary debt market helps Governments and corporates to directly sell their securities to investors. Typically, Government's issue debt through "Auctions" while corporates issue debt papers through "Private Placement". The secondary debt market provides an exit route to the investors, and it also provides important information on price discovery process through credit risk appetite, spread, default probability, etc. The tradability of bonds issued by a borrower helps the market in getting required information on the firm.

However, in practice, issuance of debt is a multi-level process adhering to various regulations. It involves underwriting, credit rating, listing with stock exchanges, coordinating with issue managers to distribute the bond to the right investors, liquidity in the market, banking support, etc. A well-functioning debt market would require developed and sustainable legal framework with clear bankruptcy codes. The regulatory cost of the debt can be at times prohibitive for smaller borrowers. Hence, small and medium firms usually prefer bank borrowing vis-a-vis debt issuances.

1.14 Primary and Secondary Debt Market in India

The debt market deals in both the Government debt as well as in non-Government debt instruments. The market has three important functionaries: (a) issuers like Government and Corporate firms; (b) intermediaries like merchant bankers and brokers selling debt; and (c) investors like commercial banks, collective investment schemes like mutual funds, pension funds, insurance companies, retail investors, etc.

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

1. Issuers are Governments, commercial banks, public sector companies, private corporate firms, etc.
2. Intermediaries are investment banks and merchant banks who help issuers to sell bonds to the investors.
3. 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 (RBI) and the Securities and Exchange Board of India (SEBI) are the main regulators in the Indian debt market.

Indian Debt market typically has three distinct segments based on issuer category – (a) 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; (b) Public sector units (PSU) and Banks issuing instruments to raise resources from the market; and (c) private sector raising resources through issuance of debt papers.

Along with dated securities, Government of India also issues Floating Rate Bonds, Inflation Indexed Bonds, Special Securities, and Cash Management Bills while State Governments

raise funds using Ujwal Discom Assurance Yojana (UDAY) Bonds. PSU Bonds are popular among investors because of their perceived low risk and Commercial Banks issue short term papers like Certificate of Deposits (CDs) as well as long term bonds to fund their various business needs. The private corporates issue instruments like Bonds, Debentures, Commercial Papers (CPs), Floating Rate Notes (FRNs), Zero Coupon Bonds (ZCBs), etc. Based on issuer of debt security and nature of debt instrument/security we can have Government Securities Market, Corporate Bond Market and Money Market.

1.14.1 Primary and Secondary Market of Government Securities

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. The Reserve Bank of India issues government securities on behalf of the government. The primary market operations of the Reserve Bank are mainly driven by the objectives of the debt management policy, which is to ensure funding of fiscal deficit from the market in a cost effective manner. The primary market instruments are treasury bills and government dated securities. The central government mobilizes funds mainly through the issue of treasury bills and dated securities while state government does so solely through dated securities.

In the primary market, Government securities & Treasury Bills are issued through auctions (yield based or price based auctions) conducted by RBI. Auctions are classified as Multiple/Uniform price auctions based on the price paid by successful bidders. When all the successful bidders are required to pay at the auction cut-off rate, it is a uniform price auction; while when successful bidders pay at the respective price/yield at which they have bid, it is termed a multiple price auction. The choice of multiple vs. uniform price auctions is made by RBI based on underlying market conditions. The minimum bid amount is ₹10,000 and in multiples of ₹10,000 thereafter. The auctions are generally conducted on weekly basis.

Auction Participants can bid under two categories based on their eligibility:

- Competitive Bidding: It is meant for well-informed institutional investors where they bid at a specific price/yield and get allotment if their quotes are within the cut-off price/yield. Such participants including banks, PDs, insurance companies, financial institutions, and mutual funds can put in multiple bids at various prices/yield levels.
- Non-Competitive Bidding (NCB): Specially provided for small and retail investors, NCB is open to participants who do not have a current account or Subsidiary General Ledger (SGL) account with RBI and submit their bid indirectly through an Aggregator/Facilitator such as Scheduled banks, PDs and specified stock exchanges. Under the scheme, eligible retail investors apply for a certain amount of securities in an auction without mentioning price/yield. Such bidders are allotted securities at the weighted average price/yield of the accepted competitive bids.

Eligible entities for competitive bidding have access to primary issuance of government securities through RBI interface. Non-competitive bidder can access primary issuance through banks, primary dealers, stock exchange mechanism and RBI Retail Direct Scheme.

The secondary market for G-Secs in India is very active with diverse groups of market participants. The infrastructure for trading and settlement is one of the best in the world which has supported the market's growth and expansion. Secondary market trading takes place through:

- Negotiated Dealing System-Order Matching (NDS-OM): In August 2005, RBI introduced an anonymous screen-based electronic order matching module called NDS-OM. Participants can trade anonymously by placing their orders on the system or by accepting the orders already placed by other participants. This anonymity ensures a level playing field for various categories of participants due to price transparency and better price discovery. NDS-OM is operated by Clearcorp Dealing Systems Limited, a wholly-owned subsidiary of CCIL, on behalf of RBI. Direct access to the NDS-OM system is available to large institutional participants like banks, PDs, etc. while other participants get indirect access through their custodians / Primary Members i.e., with whom they maintain Gilt Accounts. Retail (individual) investors having demat accounts can access through any of the existing Primary Members of NDS-OM who also act as Depository Participants.
- Over the Counter (OTC)/Telephone Market: G-Sec trading in India can also be done over telephonic negotiations with a bank / PD / financial institution either directly or through a SEBI registered broker. All such trades have to be reported on the Reported segment of NDS-OM within 15 minutes of striking the deal.
- NDS-OM-Web: This was launched by RBI on June 29, 2012, to enable Gilt Account Holders (GAHs) to control their orders and get access to real time live quotes on NDS-OM through their Primary Members only as risk controllers.
- Stock Exchanges: Stock exchanges provide trading platform to cater to the needs of retail investors. Settlement of trades is done in demat.
- RBI Retail Direct Scheme: Retail Direct Scheme is a one-stop solution to facilitate investment in Government Securities by individual investors. Under this scheme individual retail investors can open a Gilt Securities Account – "Retail Direct Gilt (RDG)" account with RBI. Using this account, retail investors can buy and sell government securities through the online portal – https://rbiretaildirect.org.in

1.14.1.1 SEBI registered Stock Brokers to access Negotiated Dealing System-Order Matching (NDS-OM) for trading in Government Securities.

Reserve Bank of India vide its notification dated February 07, 2025 permitted access of SEBI-registered non-bank brokers to Negotiated Dealing System-Order Matching (NDS-

OM) through Master Direction - Reserve Bank of India (Access Criteria for NDS-OM) Directions, 2025[3].

As per the RBI direction, any person/entity eligible to invest in Government securities in terms of the applicable rules/ guidelines issued by the Government of India / State Governments / the Reserve Bank, as amended from time to time shall be eligible to access NDS-OM either through direct access or through indirect access or through Stock Broker Connect, in terms of these Directions. **"Stock Broker Connect"** shall mean a mechanism through which a stock broker provides access to NDS-OM to its individual constituents / clients maintaining demat accounts with depositories registered with the Securities and Exchange Board of India (SEBI).

SEBI vide circular dated February 11, 2025[4] provided guideline on "Facilitation to SEBI registered Stock Brokers to access Negotiated Dealing System-Order Matching (NDS-OM) for trading in Government Securities-Separate Business Units (SBU)". The details of the same is given below:

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.

The matters related to policy, eligibility criteria, risk management, investor grievances, inspection, enforcement, claims etc. for stock brokers to transact on NDS-OM would be specified under the regulatory framework issued by the respective regulatory authority and all activities of the business unit of stock broker facilitating trading on NDS-OM would be under the jurisdiction of that regulatory authority.

In pursuance of the above regulatory jurisdiction, to demarcate the regulatory obligations and to ring fence the activities of the stock brokers and its NDS-OM activities, some of the key safeguards are being prescribed as under:

i. Stock brokers shall ensure that activities of the NDS-OM under a SBU are segregated and ring-fenced from the securities market related activities of the stock broker and arms-length relationship between these activities are maintained;
ii. Such SBU shall be exclusively engaged in activities of transacting on NDS-OM only;
iii. Stock brokers shall prepare and maintain a separate account for the SBU on arms-length basis;

[3] https://www.rbi.org.in/Scripts/BS_ViewMasDirections.aspx?id=12777
[4] https://www.sebi.gov.in/legal/circulars/feb-2025/facilitation-to-sebi-registered-stock-brokers-to-access-negotiated-dealing-system-order-matching-nds-om-for-trading-in-government-securities-separate-business-units-sbu-_91764.html

iv. The net worth of the SBU shall be kept segregated from the net worth of the stock broker in the securities market. Net worth criteria for stock broker shall be satisfied after excluding account of the SBU.
v. As the activities of the SBU shall be under the jurisdiction of another regulatory authority, Grievance Redressal Mechanism and Investor Protection Fund (IPF) of the stock exchanges and SCORES shall not be available for investors availing the services of the SBU.

Clearing and Settlement of Government Securities

The transactions relating to G-Secs (other than traded on stock exchanges) are settled through the member's securities / current accounts maintained with the RBI. The securities and funds are settled on a net basis i.e., Delivery versus Payment System-III (DvP-III). CCIL (Clearing Corporation of India Ltd.) guarantees settlement of trades on the settlement date by becoming a central counter-party (CCP) to every trade through the process of novation, i.e., it becomes seller to the buyer and buyer to the seller. All outright secondary market transactions in G-Secs are settled on a T+1 basis. However, RBI had permitted FPIs to settle OTC secondary market transactions in Government Securities either on T+1 or on T+2 basis and in such cases, it must be ensured that all such trades are reported on the trade date itself.

Conversion (Switch) of Government of India Securities through auction

RBI has also started conducting the auction for conversion of Government of India securities. Bidding in the auction implies that the market participants agree to sell the source security/ies to the Government of India (GOI) and simultaneously agree to buy the destination security from the GOI at their respective quoted prices. The source securities along with notified amount and corresponding destination securities are provided in the press release issued before the auction. The market participants are required to place their bids in RBI provided interface (e-Kuber) giving the amount of the source security and the price of the source and destination security expressed up to two decimal places. The price of the source security quoted must be equal to the FBIL closing price of the source security as on the previous working day.

Open Market Operations

OMOs are the market operations conducted by the RBI by way of sale/ purchase of G-Secs to/ from the market with an objective to adjust the rupee liquidity conditions in the market on a durable basis. When the RBI feels that there is excess liquidity in the market, it resorts to sale of securities thereby sucking out the rupee liquidity. Similarly, when the liquidity conditions are tight, RBI may buy securities from the market, thereby releasing liquidity into the market.

Repurchase or Buyback of G-Secs

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. The objectives of buyback can be reduction of cost (by buying back high coupon securities), reduction in the number of outstanding securities and improving liquidity in the G-Secs market (by buying back illiquid securities) and infusion of liquidity in the system. The repurchase by the Government of India is also undertaken for effective cash management by utilising the surplus cash balances. State Governments can also buy-back their high coupon (high cost debt) bearing securities to reduce their interest outflows in the times when interest rates show a falling trend. Governments make provisions in their budget for buying back of existing securities. Buyback can be done through an auction process (generally if amount is large) or through the secondary market route, i.e., NDS-OM (if amount is not large).

Government Securities Lending Transactions:

RBI has issued Reserve Bank of India (Government Securities Lending) Directions, 2023 in December 2023, which enable market participants to do borrowing and lending in Government Securities. These Directions shall be applicable to all Government securities lending transactions, undertaken in Over-the-Counter markets. "Government Securities Lending (GSL) transaction" refers to dealing in Government securities involving lending of eligible Government securities, for a fee, by the owner of those securities (the lender) to a borrower, on the collateral of other Government securities, for a specified period of time, with an agreement that the borrower shall return to the lender the security borrowed and the latter shall return the security received as collateral to the former at the end of the agreed period. Entities that are eligible to undertake short sale transactions in terms of Short Sale (Reserve Bank) Directions, 2018 dated July 25, 2018, as amended from time to time, shall be eligible to borrow securities under a GSL transaction. An entity eligible to undertake repo transactions in Government securities in terms of the Repurchase Transactions (Repo) (Reserve Bank) Directions, 2018 dated July 24, 2018, as amended from time to time is allowed to participate in GSL transactions as lenders of securities.

Holding of G-Secs

The Public Debt Office (PDO) of RBI, acts as the registry and central depository for G-Secs. They may be held by investors either as physical stock or in dematerialized (demat/electronic) form. From May 20, 2002, it is mandatory for all the RBI regulated entities to hold and transact in G-Secs only in dematerialized (SGL) form.

a. **Physical form:** G-Secs may be held in the form of stock certificates. A stock certificate is registered in the books of PDO. Ownership in stock certificates cannot be transferred by way of endorsement and delivery. They are transferred by executing a transfer form as the ownership and transfer details are recorded in the books of PDO. The transfer of a stock certificate is final and valid only when the same is registered in the books of PDO.

b. **Demat form (Electronic Form) :** Holding G-Secs in the electronic or scripless form is the safest and the most convenient alternative as it eliminates the problems relating to

their custody, viz., loss of security. Besides, transfers and servicing of securities in electronic form is hassle free. The holders can maintain their securities in dematerialised form in either of the two ways:

i. SGL Account: Reserve Bank of India offers SGL (Subsidiary General Ledger) Account facility to select entities who can hold their securities in SGL accounts maintained with the Public Debt Offices of the RBI. Only financially strong entities viz. Banks, PDs, select UCBs and NBFCs which meet RBI guidelines (please see RBI circular IDMD.DOD.No. 13/10.25.66/2011-12 dt Nov 18, 2011) are allowed to maintain SGL with RBI.
ii. Gilt Account: As the eligibility to open and maintain an SGL account with the RBI is restricted, an investor has the option of opening a Gilt Account with a bank or a PD which is eligible to open a CSGL (Constituent Subsidiary General Ledger) account with the RBI. Under this arrangement, the bank or the PD, as a custodian of the Gilt Account holders, would maintain the holdings of its constituents in a CSGL account (which is also known as SGL II account) with the RBI. The servicing of securities held in the Gilt Accounts is done electronically, facilitating hassle free trading and maintenance of the securities. Receipt of maturity proceeds and periodic interest is also faster as the proceeds are credited to the current account of the custodian bank / PD with the RBI and the custodian (CSGL account holder) immediately passes on the credit to the Gilt Account Holders (GAH).

Investors also have the option of holding G-Secs in a dematerialized account with a depository (NSDL / CDSL, etc.). This facilitates trading of G-Secs on the stock exchanges.

1.14.2 Primary and Secondary Market of Corporate Bonds / Non-Convertible Debentures

In India, corporate bonds are issued mainly on private placement basis and only small part of the total issuances are through public offer. A private placement is usually made to institutional investors. Private placement allows customized structure of the issue as per the requirements of issuers or investors.

Public Issuance

"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. SEBI Regulations and amendments thereon govern public issue of debt securities. While the offer document for a public issue is not required to be approved by SEBI, an In-Principle approval is obtained from the stock exchange where it is to be listed. The offer document is prepared as per the disclosure requirements under the Companies Act, 2013 and Securities and Exchange Board of India (Issue and Listing of Non-Convertible Securities) Regulations, 2021 and other SEBI Debt Securities related regulations.

Private Placement

Private Placement refers to an offer of sale of debt securities by an issuer to a select group of people/institutions. All the necessary information about the issue is given in the Private Placement Memorandum (PPM). SEBI issued separate regulation for issue and listing of debt securities, municipal securities, securitized debt. Listing of all debt securities, whether privately placed or a public/rights issue, is done through a separate listing agreement.

SEBI (Issue and Listing of Non-Convertible Securities), 2021 ('NCS Regulations') is the main regulations for issuance of corporate debt securities. The face value of a listed debt security or non-convertible redeemable preference share issued on private placement basis traded on a stock exchange or OTC basis shall be Rs. One lakh. However, the Issuer may issue debt security or non-convertible redeemable preference share on private placement basis at a face value of Rs. Ten Thousand subject to fulfilment of certain conditions.

With the majority of corporate debt issuances in India being private placements, SEBI vide its circular of April 21, 2016, mandated the private placement issuance through electronic book mechanism / electronic bidding platform (EBP) for better and transparent price discovery. SEBI further streamlined the procedure through its revised guidelines dated October 10, 2022[5] and May 16, 2025[6]. The EBP guidelines are applicable for debt securities and non-convertible redeemable preference shares as defined under SEBI regulations, municipal debt securities. For certain private placement issuance based on issue size, existence of issuer etc. EBP is mandatory as given below.

The following issues of securities shall be made through the EBP platform:

- A private placement of debt securities and NCRPS as per the provisions of SEBI NCS Regulations, 2021 and municipal debt securities as per provisions of SEBI (Issue and Listing of Municipal Debt Securities) Regulations, 2015, if it is:
    a. a single issue, inclusive of green shoe option, if any, of Rs. 20 crore or more;
    b. a shelf issue, consisting of multiple tranches, which cumulatively amounts to Rs. 20 crore or more, in a financial year; and
    c. a subsequent issue, where aggregate of all previous issues by an issuer in a financial year equals or exceeds Rs. 20 crore

An issuer, if desirous, may choose to access EBP platform for private placement of securitised debt instruments or security receipts or CPs or CDs, and issuers constituted as REITs, SM REITs and InvITs may also access the EBP platform for private placement of units of REITs, SM REITs and InvITs. Issuers of debt securities, NCRPS and municipal debt securities on private placement basis of issue size less than Rs. 20 crore may also choose to access the EBP platform for such issuances.

[5] https://www.sebi.gov.in/legal/circulars/oct-2022/review-of-provisions-pertaining-to-electronic-book-provider-platform-replacement-of-chapter-vi-to-operational-circular-dated-august-10-2021_63807.html

[6] https://www.sebi.gov.in/legal/circulars/may-2025/review-of-provisions-pertaining-to-electronic-book-provider-ebp-platform-to-increase-its-efficacy-and-utility_94020.html

All participants are required to enroll with EBPs prior to entering into the bidding process. These include issuers, arrangers, QIBs, non-QIBs and custodians. Arrangers bid on the EBP platform on behalf of other eligible participants and include Merchant Bankers/ Brokers/ RBI registered Primary Dealers. Custodians bid on behalf of their foreign portfolio investor (FPI) clients. All non-QIB participants including arrangers have to be authorized by the issuer to participate in a particular issue. Exchanges provide unique codes to each participant which can be used to participate in EBP platform. The Issuer shall provide the Placement Memorandum and term sheet (i.e. summary of important terms and conditions related to an issue) to the EBP at least two working days prior to the issue opening date. However, the issuer issuing the securities for the first time through EBP platform shall provide the above information at least three working days prior to the issue to the opening date. Issuer shall make the bidding announcement on EBP at least one working day before initiating the bidding process.

The PPM/IM has to mandatorily disclose the mode of bidding (open/close), manner of allotment (uniform/ multiple yield), manner of settlement (through clearing corporation/ escrow bank account of issuer) and settlement cycle (T+1 or T+2). Issuer shall have an option to avail an 'anchor portion' within the base issue size. The quantum of allocation(s) to the anchor investor(s) shall be at the discretion of the issuer, subject to total allocation to the anchor(s) not exceeding 30%/40%/50% of the base issue size. The maximum anchor portion is depends on instrument rating. If the issuer opts for anchor portion, the same shall be suitably disclosed in the placement memorandum and the term sheet along with the relevant quantum. In case of open bidding, the bid information, such as bid value and bid rate/price (except the bidder's name), is available to the market during the bidding window. However, in case of closed bidding, the same is disclosed post-bidding. Only the cumulative bids amount (in Rs crores) is displayed to the eligible participants during the bidding period. The issuer has to disclose the estimated cut off yield to the EBP at least one hour prior to opening of the bidding for the issue. Successful bids are determined by the EBP as per the guideline provided by SEBI and post successful closure, shared with the designated Registrar to the Issue. It also electronically notifies all the successful bidders about the total payable amount in INR, details of the pay-in account where the amount is to be deposited and the pay-in date and cut-off time. Once the bidding window closes, the EBP gives out the details regarding issuance which includes yield/coupon/price, amount with oversubscription, total bids received, ratings, category of Investor (anonymous basis), etc. on its website.

Secondary Market Mechanism of Corporate Bonds

Unlike the G-Sec segment with dominant electronic trading and easy availability of trade information, corporate debt trading in India is mainly OTC. Regulatory measures have improved dissemination of trade information which led to improved transparency on market activity and levels. The secondary market of corporate bonds is mainly institutional market. The market is basically negotiated market where transactions are executed OTC (over the counter) and then it is reported in Exchange reporting platform

for market dissemination and bilateral settlement on DVP-I mechanism through clearing corporation. Every corporate bond trade in India, whether done over-the-counter (OTC) or through exchanges, must be reported within 15 minutes of execution. This is a rule set by the SEBI, aimed at promoting transparency and reducing systemic risks. The settlement of all such trades takes place from T+0 to T+2.

The Exchanges in early 2020 have launched Request for Quote platform (RFQ) for execution and settlement of trades which will allow market participants to transact in debt securities. The RFQ Platform provides market participants range of options to seek a quote and to respond to a quote, while keeping an audit trail of all the interactions i.e., quoted yield, mutually agreed price, deal terms etc. This has brought pre-trade transparency in the transactions of eligible debt securities. RFQ facilitate participant to negotiate various terms of transaction through screen-based system. SEBI has taken various steps to developed RFQ platform. Some of them are mentioned below:

SEBI vide circular no. SEBI/HO/DDHS/DDHS_Div1/P/CIR/2022/142 dated October 19, 2022 on 'Request for Quote (RFQ) platform for trade execution and settlement of trades in listed Non-convertible Securities, Securitised Debt Instruments, Municipal Debt Securities and Commercial Paper' has permitted stock brokers registered under the debt segment of the Stock Exchange(s) to place/ seek bids on the RFQ platform on behalf of client(s), in addition to the existing option of placing bids in a proprietary capacity.

SEBI vide circular no. SEBI/HO/DDHS/P/CIR/2022/00144 dated October 28, 2022, on 'Reduction in denomination for debt securities and non-convertible redeemable preference shares'inter-alia modified the face value of the listed debt security and non-convertible redeemable preference share issued on private placement basis traded on a stock exchange or OTC basis from Rs. Ten Lakh to Rs. One lakh.

SEBI vide circular No. SEBI/HO/DDHS/DDHS-RACPOD1/P/CIR/2022/154 dated November 14, 2022, on 'Registration and regulatory framework for Online Bond Platform Providers' inter-alia stipulated that all the orders with respect to listed debt securities placed on an online Bond Platform shall be mandatorily routed through the RFQ platform of the recognised Stock Exchange(s) and settled through the respective Clearing Corporations.
SEBI vide circular no. SEBI/HO/DDHS/DDHS-RACPOD1/P/CIR/2023/9 dated January 09, 2023, on "Mode of settlement for trades executed on the Request for Quote (RFQ) platform" has allowed in addition to the Real-Time Gross Settlement (RTGS) mechanisms, payment mechanisms provided by banks/payment aggregators authorised by Reserve Bank of India, from time to time, may be used for settlement of trades executed on the RFQ platform.

In order to simplify the process of yield to price computation for non-convertible securities, cash flow dates regarding payment of interest/ dividend/ redemption for the securities traded on RFQ platform for the purpose for yield to price computation shall not

be adjusted for day count convention and shall accordingly be based on the due date of payment as per the cash flow schedule and not as per the date of payment.

SEBI vide circular dated August 02, 2023, mandated stock brokers with effect from April 01, 2024, for all the trades in proprietary capacity, SBs shall undertake at least 25% of their total secondary market trades by value in CBs in that month by placing/seeking quotes through OTO (One to One) or OTM (One to Many) mode on the RFQ platform of stock exchanges.

SEBI vide circular dated August 07, 2023, mandated FPIs to undertake at least 10% of their total secondary market trades in Corporate Bonds by value by placing/seeking quotes on the RFQ platform of stock exchanges, on a quarterly basis.

Similar mandate is given to Mutual Funds, Alternative Investment Funds, Portfolio Management Services to undertake certain % of their transaction in secondary market in corporate bonds through RFQ platforms.

Exchanges also provide Order Matching platform (similar to equity) for trading in corporate bond securities.

Online Bond Platform Provider (OBPP): Online Bond Platform Provider means any person operating or providing an online bond platform. Online Bond Platform means any electronic system, other than a recognised stock exchange or an electronic book provider platform, on which the debt securities which are listed or proposed to be listed, are offered and transacted. OBPPs provide an avenue for investors, particularly non-institutional investors to access the bond market.

1.14.3 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. The entities having excess and the entities with shortage of funds participate in this market. The RBI uses the money market for transmission of its monetary policy direction by changing various Reserve ratios, conducting Open Market Operations, increasing or decreasing of policy rates, etc.

Participants in the Indian money market include Public Sector Banks, Private Sector Banks, Foreign Banks, Co-operative Banks, Financial Institutions, Insurance Companies, Mutual Funds, Primary Dealers, Bank cum Primary Dealers, Non-Banking Financial Companies (NBFCs), Corporates, Provident/Pension Funds, Payment Banks, Small Finance Banks, etc.

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.

These are explained briefly below:

a) ***Call Money:*** The call money market is an avenue for unsecured lending and borrowing of funds. This market is a purely interbank market in India restricted only to Scheduled Commercial Banks (SCBs) and the Primary Dealers (PDs). Call money transactions are dealt/ reported on the Reserve Bank of India's NDS-CALL (Negotiated Dealing System – Call) platform, which is managed by CCIL, and are predominantly overnight (tenor of borrowing may be extended to account for weekends and holidays).

b) ***Notice Money:*** This is an extension of the interbank call market with uncollateralized lending and borrowing of funds for a period beyond overnight and up to 14 days. Notice money transactions are dealt / reported on the RBI's NDS-CALL.

c) ***Term Money***: This is an extension of the interbank call market for uncollateralized lending and borrowing of funds for a period between 15 days and 1 year. Term money transactions are dealt / reported on the RBI's NDS-CALL.

d) ***Market Repo***: Repo, also known as a ready forward contract, refers to borrowing funds via sale of securities with an agreement to repurchase the same at a future date with the interest for the borrowings incorporated in the repurchase price. Reverse repo is the exact opposite transaction which is essentially a collateralized lending of funds. Each repo/ reverse repo deal thus has two parts (or, two legs). The repo period Is the time between the two legs. The interest is computed on the actual amount borrowed by the repo seller which is the consideration amount in the repo's first leg. The lender receives the interest in the second leg when the security is bought back by the borrower at a higher consideration that includes the interest. RBI regulates the repo market in India and major participants are Scheduled Commercial Banks, Primary Dealers, Mutual Funds, NBFCs, Financial Institutions, Insurance Companies, Corporates, Provident / Pension Funds, Payment Banks, Small Finance Banks, etc. Repo transactions against G-secs are traded / reported on the Clearcorp Repo Order Matching System (CROMS) electronic platform of the Clearcorp Dealing Systems. These are settled by CCIL along with the G-secs.

e) ***Triparty Repo i***n Government Securities: "Triparty repo" is a type of repo contract with a third party intermediary between the borrower and lender known as the Triparty Agent (TPA). The TPA does the collateral selection, payment and settlement, custody and management during repo period. Following RBI's authorization to CCIL to act as a TPA, the 'Collateralized Borrowing and Lending Obligation' (CBLO) launched by CCIL on January 20, 2003, was converted into TREP on November 5, 2018. The Tri Party Repo Dealing System (TREPS), an anonymous order matching trading platform, is provided by Clearcorp Dealing Systems (India) Ltd with CCIL as the Central Counterparty (CCP) for borrowing and lending of funds against government securities in India with a triparty arrangement. All the repo eligible entities can trade on TREPS, and the funds borrowed on TREPS are exempted from RBI's CRR/SLR computation and the security acquired under the deal is eligible for SLR by the acquiring Bank. Unlike Repo, TREPS facilitate the

trading of Repo and the seller of the security has a right to substitute the security. Stock Exchanges have also introduced Triparty Repo on Corporate Bonds.

f) ***Treasury Bills (T-bills)***: In India, Treasury bills or T-bills are used for short term borrowing by the Government of India and are considered to be a part of the money market as they mature within a year from issue. These are basically zero coupon securities which are issued at a discount and are redeemed at par. Normally RBI conducts weekly auctions (on Wednesday) for three tenors of T-bills: 91, 182 and 364 days.

g) ***Cash Management Bills (CMBs)***: Essentially very short term T-bills, Cash Management Bills (CMBs) are issued by the Government of India to fund the temporary mismatches in its cash flow. CMBs have maturities less than 91 days. This is issued to absorb excess liquidity in the system after auction for usual Treasury Bills on weekly basis.

h) ***Commercial Paper (CP)***: A Commercial Paper (CP) is used by Indian corporates to raise short-term unsecured funds. CPs are also discounted instruments like T-bills and are issued for ₹5 lakh and multiples thereof for maturities between 7 days and one year. CP issuances are governed by RBI regulations. CPs are issued in dematerialised form and held with depository registered with SEBI. Companies, including Non-Banking Finance Companies (NBFCs) and All India Financial Institutions (AIFIs), are eligible to issue CPs subject to the condition that any fund-based facility availed of from bank(s) and/or financial institutions is classified as a standard asset by all financing banks/institutions at the time of issue. Other entities like co-operative societies/unions, government entities, trusts, limited liability partnerships and any other body corporate having presence in India with a net worth of Rs. 100 crore or higher subject to the condition as specified above. The minimum credit rating for a CP shall be 'A3' as per rating symbol and definition prescribed by SEBI. The Issuing and Paying Agent (IPA) shall be appointed for each CP issuance.

i) ***Certificate of Deposit (CD)***: Certificate of Deposits is a negotiable, unsecured money market instrument issued by a bank[7] as a Usance Promissory Note against funds deposited at the bank for a maturity period upto one year. CDs are also discounted instruments like T-bills and are issued for ₹5 lakh and multiples thereof for maturities between 7 days and one year. All India Financial Institutions can issue CDs for a period not less than 1 year and not exceeding 3 years from the date of issue.

j) **Repo in Corporate Bond/ Corporate Debt Securities:** Repo in corporate bonds was introduced by RBI in 2010 and the eligible securities for CBR include:
    a. Listed corporate bonds and debentures, (however, participants cannot borrow against the collateral of their own securities or those of related entities);
    b. CPs and CDs; and
    c. Units of Debt ETFs.

[7] CDs can also be issued by the All India Financial Institution which shall be guided by the specific RBI Directions

d. Any other security of a local authority as may be specified in this behalf by the Central Government.

k) **Exchange Traded Tri-party Repo in Corporate Debt Securities**: Tri-party repo on corporate debt securities is available for trading on the exchanges. The Tri-party repo is a type of repo contract where a third entity (apart from the borrower and lender), called a Tri-Party Agent, acts as an intermediary between the two parties to the repo to facilitate services like collateral selection, payment and settlement, custody and management during the life of the transaction. The aim to introduce Tri-party repo in corporate bonds was to improve liquidity in the corporate bond market. Tri-party repos are transacted as per the terms of Tri-party repo (Reserve Bank) Directions Tri-party repo (Reserve Bank) Directions, 2018 Amendment dated November 28, 2019, or such other directions issued by the Reserve Bank of India (RBI) from time to time. AMC Repo Clearing Ltd. (ARCL) is a limited purpose clearing corporation (LPCC) acts as a tri-party repo agent. The Tri-party repo product in corporate debt securities is currently traded on Exchange Tri-party repo Market Trading Platform and Clearing & Settlement done by ARCL which also provide settlement guarantee for these transactions.

1.14.3.1 Importance of the Call Money Market

For the lenders, call money is the second most liquid asset after cash. In India, it enables banks to even out their day-end demand and supply of overnight funds. Banks prefer it for day-end liquidity or for reserve management because of operational ease with no collateral and low transaction costs and same day settlement of funds at RBI. Due to its unsecured nature and criticality for meeting unforeseen fund mismatches in the banking system, RBI, in August 2005 converted the call segment into a pure interbank market (including PDs).

Overnight MIBOR

The Mumbai Interbank Outright Rate (MIBOR) benchmark rate is based on overnight call money market transactions and is administered by the Financial Benchmarks India Pvt. Ltd. (FBIL) with CCIL as the 'Calculation Agent'. Overnight MIBOR is notified by RBI as a 'significant benchmark' as it is the most widely used rate in India for pricing and settlement of derivatives and other contracts. Overnight MIBOR is a volume weighted average rate based on actual trades executed on the NDS-CALL platform during the first hour of trading.

1.14.3.2 Economic Utility of Repo Market

Repo market is used by the traders for funding their positions and taking position in the market to execute their views on interest rate. Traders short sell[8] a GOI security, if they think the price of the security is likely to fall due to expected increase in interest rate for a particular segment and they borrow the said security in the Repo market to make

[8] Short selling is allowed only in certain securities and for certain entities

deliveries. RBI allows short sale upto 90-days, but the short selling entity has to borrow the security from the Repo market to make deliveries against the short sale.

1.14.4 Role of Regulators

Reserve Bank India (RBI) manages the borrowing of the Central and State Governments including the Union Territories. The RBI also acts as the regulator for the Money market and the G-Sec market. The RBI also governs instruments issued by Commercial Banks and other Institutions regulated by it. The RBI Act, 1934, Government Securities Act, 2006, Payment & Settlement Systems Act, 2007, Foreign Exchange Management Act, 1999, Banking Regulation Act, 2017, etc. are the major regulations used by RBI to ensure an efficient debt market for Government securities.

The Securities and Exchange Board of India (SEBI) is the regulator for the corporate bond market including instruments issued by Commercial Banks and PSUs, provided such issuances by the above regulated entities are of more than one year of maturity. The role of SEBI is paramount when the funds are raised through public issuance. As per the guidelines issued by SEBI, the issuers are required to fully disclose the risks to the investors. For this, the regulator has implemented elaborate risk disclosure standards. Institutional investors like Foreign Portfolio Investors and Mutual Funds also adhere to SEBI guidelines while investing in the market. SEBI also frames guidelines for Debenture Trustees, Credit Rating agencies, Merchant Bankers, etc. to enable a smooth and well-functioning debt market.

1.14.5 Role of Credit Rating Agencies

Credit risk is the risk of default on a debt that arises from the borrower failing to make required payments. Sovereign domestic currency based debt instruments are regarded as safe sovereign investment and perceived to be “credit risk free”. Pricing and returns for non-government debt instruments are dictated by their issuers’ creditworthiness i.e., the continuing ability of the issuer / borrower to service the debt payments. Any deterioration in financial capability of the borrowing firm may result in delinquency, either in part or in full. Debt investments are generally long term investments and are illiquid. Hence, investors must have full information about the issuer as well as the issue, through regulatory and voluntary disclosures. The voluminous information about the issuer as well as the issue are required to be standardized and summarized through a well-qualified and unbiased agency that can provide the independent view about the possible future performance of the debt. This particular role of providing risk information about the possible future performance of the issue is typically performed by a Credit Rating Agency in the debt market. As per the extant SEBI regulations in force in the capital markets, it is necessary for an issuer to obtain a rating from any of the major credit rating agencies. In India, the Rating Agencies are regulated by SEBI under SEBI (Credit Rating Agencies) Regulations, 1999.

A Credit Rating Agency (CRA) is a company that provides information about the riskiness of a debt instrument or a company in terms of its promised performance of a debt instrument. They are regulated by SEBI and have to follow governance standards while giving the Rating on a debt instrument. They issue letter grades to instruments: “AAA” for

highest safety, “D” for a Default and many other grades in between. The CRAs may rate government and corporate bonds, CDs, CPs, municipal bonds, preferred stock, mortgage-backed securities and collateralized debt obligations, etc. Investors typically see the rating before they invest in a debt instrument.

In the current times, credit rating has become an integral part of debt market around the globe. SEBI mandates disclosure of at least one Credit Rating while issuing debt instrument. The credit rating represents a CRA’s evaluation of the qualitative and quantitative information pertaining to the prospective debtor, including information provided by the prospective debtor and other non-public information obtained by the credit rating agency’s analysts.

Ratings are the probability of default on repayment of principal or interest on relative scale i.e., an issuer’s likelihood to default and its likelihood to default compared to another similar issuer. Ratings assigned by the rating agencies are taken as a key indicator of the relative riskiness of the bonds and to determine the credit spread to be charged for these instruments. It must be noted that the CRAs always qualify the rating provided for an entity or instrument and encourage investors to look for other possible publicly available information on the companies along with the rating information. Often bonds are rated by more than one rating agency.

For ease of understanding by investors, CRAs generally assign letter grades for their view of the instruments. The highest quality (safest, lower yielding) bonds are commonly referred to as “AAA”, while the least creditworthy are termed as "junk".

Common Scale of Ratings:

- AAA to BBB- : Investment Grade
- BB+ to CCC- : Non-investment or Junk Grade
- D : Default Rating
- Short term Scale : A1+ to D

The table below shows the ratings and their general significance which may be different for different credit rating agency. Rating agency may apply '+' (plus) or '-' (minus) signs for ratings to reflect comparative standing within the category.

Rating	**General Significance**
AAA	Highest Degree of Safety
AA	High Degree of Safety
A	Adequate Safety
BBB	Moderate Safety
BB	Moderate Risk
B	High Risk
C	Very High Risk
D	Default

Sample Questions

1. Which of the following has higher credit risk?
    a. Bond rated AAA
    b. Bond rated A
    c. Bond rated BBB
    d. All of them have same credit risk

2. Credit spread is the price of _____.
    a. Credit risk
    b. Reinvestment risk
    c. Price risk
    d. All of the above

3. If the long-term rate is 10% and short-term rate is 8%, the shape of term structure of rates is _____.
    a. Normal/positive
    b. Inverted/negative
    c. Flat
    d. humped

4. The concept of "accrued interest" applies to which of the following?
    a. Zero coupon bond
    b. Coupon bond
    c. Both (a) and (b)
    d. None of the above

5. If the coupon of the bond increases, its Modified Duration will _____. (Other things remaining constant).
    a. Increase
    b. Decrease
    c. May increase or decrease
    d. Remain constant

CHAPTER 2: INTEREST RATE DERIVATIVES

LEARNING OBJECTIVES:

After studying this chapter, you should know about:

- Definition and Economic Functions of Derivatives
- Derivatives on Interest Rate and Interest Rate Instrument
- Growth Drivers in Derivatives
- Market Participants in Interest Rate Derivatives
- OTC versus Exchange-Traded Derivatives

2.1 Derivatives: Definition and Economic Role

Derivative is something that is *derived* from another thing called the underlying. The underlying is independent, and the derivative is dependent on and derived from the underlying. The derivative cannot exist without the underlying. This is the general definition of derivative. For example, wheat farmers may wish to sell their harvest at a future date to eliminate the risk of a change in prices by that date. Such a transaction is an example of a derivative. The price of this derivative is driven by the spot price of wheat which is the "underlying".

However, accounting standards like FAS 133 (in the US), IAS 39 (in the EU) and AS 30 (in India) impose more qualifications for derivatives. For example, IAS 39 and AS 30 require the following three criteria to be satisfied for financial derivatives.

1. Value of derivative is linked to the value of underlying
2. Trade settled on a “future” date
3. On trade date, there should be no full cash outlay

FAS 133 requires an additional qualification:

4. Trade must settle (or capable of being settled) on *net* basis and not on gross basis.

The first requirement implies that the price of derivatives is determined by the price of underlying, and not by the demand-supply for derivative. The underlying is the raw material and derivative is the finished product. If the underlying price goes up (or down), the derivative price will go up (or down) regardless of demand-supply for derivative.

The “future” date in the second requirement means that the settlement of the derivative must be later than that for underlying. For example, if the underlying settles on two business days after trade date (T+2), the derivative on that underlying must settle later than T+2; if the underlying settles in T+5, the derivative on that underlying must settle later than T+5; and so on.

The third requirement provides “leverage”: ability to buy the underlying without fully paying for it immediately or sell it without delivering it immediately.

Derivatives are classified into five asset classes: rate, credit, equity, forex and commodity. In each asset class, there are four generic products: *forward, futures, swap* and *option*.

Derivative products initially emerged as hedging devices against fluctuations in commodity prices, and commodity linked derivatives remained the sole form of such products for almost three hundred years. Financial derivatives came into spotlight in the post 1970 period due to growing instability in the financial markets. However, since their emergence, these products have become very popular and by 1990s, they accounted for about two thirds of total transactions in derivative products. In recent years, the market for financial derivatives has grown tremendously in terms of variety of instruments available, their complexity and also turnover.

With Securities Laws (Second Amendment) Act, 1999, Derivatives has been included in the definition of Securities. The term Derivative has been defined in Securities Contracts (Regulations) Act, 1956 as:
a. a security derived from a debt instrument, share, loan, whether secured or unsecured, risk instrument or contract for differences or any other form of security;
b. a contract which derives its value from the prices, or index of prices, of underlying securities;
c. commodity derivatives; and
d. such other instruments as may be declared by the Central Government to be derivatives;

Further Section 18A of the act provides that notwithstanding anything contained in any other law for the time being in force, contracts in derivative shall be legal and valid if such contracts are:

- Traded on a recognized stock exchange
- Settled on the clearing house of the recognized stock exchange, in accordance with the rules and bye–laws of such stock exchanges.
- Between such parties and on such term as the Central Government may, by notification in the Official Gazette specify

Derivatives are tools to manage price risk. How you manage risk depends on your approach to risk. If you want to take risk , you will trade in derivatives which is called speculation. When you want to avoid risk, you manage it one of the three ways: elimination (called hedging); insurance and minimization (called diversification). The following table summarizes the approaches to market risk management.

The following table summarizes 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.

Approach	Explanation
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).

Let's understand derivatives with simple example:

- A wheat farmer and a miller sign a contract to exchange a cash of Rs. 10000/- for a 100 Kg. of wheat after 2 months. The party agreeing to buy the underlying asset in the future assumes a long position, and the party agreeing to sell the asset in the future assumes a short position. The price agreed upon is called Forward Price and the settlement date is called Expiration Date. Both parties have reduced a future risk: for the wheat farmer, the uncertainty of the price, and for the miller, the availability of wheat at a specific price.
- Still there is risk in the contract, firstly, no wheat will be available or that one party will renege on the contract. Both reduce a risk and acquire a risk when they sign the derivative contract
    - The farmer reduces the risk that the price of wheat will fall below the price specified in the contract and acquires the risk that the price of wheat will rise above the price specified in the contract (thereby losing additional income that he could have earned).
    - The miller, on the other hand, acquires the risk that the price of wheat will fall below the price specified in the contract (thereby paying more in the future than he otherwise would have) and reduces the risk that the price of wheat will rise above the price specified in the contract.

2.1.1 Key Economic Functions of Derivatives:

Though the primary economic role of derivatives is Risk Management, derivatives market also serves the following functions:

- Hedging risk exposure: Since the value of the derivatives is linked to the value of the underlying asset, the contracts are primarily used for hedging risks. For example, an investor may purchase a derivative contract whose value moves in the opposite direction to the value of an asset the investor owns. In this way, profits in the derivative contract may offset losses in the underlying asset.
- Price discovery: Derivative market serves as an important source of information about prices. Prices of derivative instruments such as futures and forwards can be used to determine what the market expects future spot prices to be. In most cases, the

information is accurate and reliable. Thus, the futures and forwards markets are especially helpful in price discovery mechanism.

- Market efficiency: It is considered that derivatives increase the efficiency of financial markets. By using derivative contracts, one can replicate the payoff of the assets. Therefore, the prices of the underlying asset and the associated derivative tend to be in equilibrium to avoid arbitrage opportunities.
- Access to unavailable assets or markets: Derivatives can help organizations get access to otherwise unavailable assets or markets. By employing interest rate swaps, a company may obtain a more favourable interest rate relative to interest rates available from direct borrowing.
- Price Stability: It has been seen that many countries central banks uses derivatives for stabilising the currency prices. In India, RBI also intervene in forex market through derivatives for INR stability.
- Derivatives, due to their inherent nature, are linked to the underlying markets. With the introduction of derivatives, the underlying market witnesses higher trading volumes because of participation by more players who would not otherwise participate for lack of an arrangement to transfer risk.
- Speculation: Financial speculation involves the buying, holding, selling, and short-selling of stocks, bonds, commodities, currencies, real estate, derivatives, or of any other financial instrument, in order to profit from fluctuations in its price. This is not the only use, and probably not the most important use, of financial derivatives. Financial derivatives are considered to be risky. If not used properly, these can lead to financial destruction in an organisation. However, these instruments function as a powerful instrument for knowledgeable traders to expose themselves to calculated and well understood risks in search of a reward, that is, profit.
- Derivatives market helps shift of speculative trades from unorganized market to organized market. Risk management mechanism and surveillance of activities of various participants in organized space provide stability to the financial system.

Market Participants must understand that derivatives, being leveraged instruments, have risks like counterparty risk (default by counterparty), price risk (loss on position because of price move), leverage risk (magnifying the gain and losses), liquidity risk (inability to exit from a position), legal or regulatory risk (enforceability of contracts), operational risk (fraud, inadequate documentation, improper execution, etc.) and may not be an appropriate avenue for someone of limited resources, trading experience and low risk tolerance. A market participant should therefore carefully consider whether such trading is suitable for him/her based on these parameters. Market participants who trade in derivatives are advised to carefully read the Risk Disclosure Document, given by the broker to his clients at the time of signing agreement.

2.2 Products in Derivatives Market

As specified earlier, derivatives can be classified into five asset classes: interest rate, credit, equity, forex and commodity. In each asset class, there are four generic products: *forward, futures, swap* and *option*. We will examine this product with interest rate as asset class. 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.

2.2.1 Forwards

It is 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. Both the contracting parties are committed and are obliged to honour the transaction irrespective of price of the underlying asset at the time of delivery. Since forwards are negotiated between two parties, the terms and conditions of contracts are customized. These are Over-the-counter (OTC) contracts. Contracts are mainly settled in delivery. However, in certain cases, they are settled in cash on expiration date. Generally, no margin or mark to market is collected for such contracts.

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. For example, two parties can enter into an agreement to borrow INR 100 Crores after 60 days for a period of 91 days, at say 5% p.a. and settlement is based on 91-day T-Bills yield. This means that the settlement date is after 60 days, on which date the money will be borrowed/lent for a period of 90 days. The party that is borrowing money under the FRA has a long position, and the party that is lending money has a short position in the FRA. FRA contracts are usually cash-settled, that is, the money is not actually lent or borrowed. Instead, the forward rate specified in the FRA is compared with the benchmark rate (in this case 91-day T-Bills yield). If the benchmark rate is greater that the FRA rate, then the long is effectively able to borrow at a below market rate. The long will therefore receive a payment based on the difference between the two rates. Assume that on the settlement date, the actual 91-day T-Bills yield is 5.5%. This means that the long is able to borrow at a rate of 5% under the FRA, which is 0.5% less than the market rate. Total saving for borrower in interest = 100 Crores * 0.5% *91/365 = Rs.12.46 lacs. The borrower would save Rs. 12.46 lacs by entering into an FRA. However, we need to make one more adjustment to get the accurate value. The settlement in FRA is on a cash basis, and settlement takes place on a pre-decided date. But the saving above is after the duration of the loan (in the above example after 91 days). So, the present value of the expected savings needs to be calculated to determine the accurate quantum of savings.

Let’s take another example of FRA:

Let's assume a company enters into a **3×6 FRA** (a contract starting in 3 months and ending in 6 months) to hedge against an expected rise in interest rates.

Parameter	**Value**
Notional Principal	INR 10,00,000
FRA Rate (Fixed Rate)	5% p.a.
Floating Rate at settlement	6% p.a.
Contract period	3 months
Settlement Date	3 months

Interest Rate Difference : 6% - 5% = 1%
Interest Amount Difference = (10,00,000 * 1% * 3) / 12 = Rs. 2500
Since FRA settles today, the cash settlement is discounted.
Settlement Amount = 2500 / {1+(6%*3/12)} = Rs. 2463.05

Bond Forward

RBI vide Notification No. FMRD.DIRD.17/14.03.042/2024-25 dated February 21, 2025 has issued Reserve Bank of India (Forward Contracts in Government Securities) Directions, 2025. These Directions apply to forward contracts in government securities (hereinafter referred to as bond forwards) undertaken in the Over-the-Counter (OTC) market in India. Following some of salient features of the direction:

- Bond forward means a rupee interest rate derivative contract in which one counterparty (buyer) agrees to buy a specific **Government Security** from another counterparty (seller) on a specified future date and at a price determined at the time of the contract. Hence, underlying for bond forward can be Government Securities only.
- A resident; and A non-resident who is eligible to invest in Government Securities under the Foreign Exchange Management (Debt Instruments) Regulations, 2019 dated October 17, 2019, are eligible to undertake bond forward transactions to the extent permitted under these Directions
- Certain entities like banks, PDs are allowed to undertake transactions in bond forwards as market-makers
- Any entity, eligible to be classified as a non-retail user in terms of the Rupee Interest Rate Derivatives (Reserve Bank) Directions, 2019, dated June 26, 2019, as amended from time to time, shall be eligible to undertake transactions in bond forwards as a user.
- A bond forward transaction may be physically-settled or cash-settled.
- A cash-settled bond forward transaction may be settled bilaterally or through any clearing arrangement approved by the Reserve Bank for the purpose.
- A physically-settled bond forward transaction shall be settled through the Clearing Corporation of India Ltd. (CCIL) or any other clearing agency or clearing arrangement approved by the Reserve Bank for the purpose.

2.2.2 Futures

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. Indeed, we may say futures are exchange traded forward contracts. Contracts are mainly settled in cash; however in certain cases they are settle in physically on expiration date. Margins and mark to market are applicable for such contracts. Settlement guarantee is provided by the clearing corporation of the Exchanges.

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 also include money market Futures.

2.2.3 Options

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. While buyer of option pays the premium and buys the right, writer/seller of option receives the premium with obligation to sell/ buy the underlying asset, if the buyer exercises his right. Call Option gives buyer of an option the right to buy the asset and put option gives buyer of an option the right to sell the asset. In case of futures/forwards, it is an obligation on both buyer as well as seller to settle the contract, however in option the buyer of an option has right but not the obligation to buy/sell the underlying asset.

- Interest Rate Option (IRO) is an option contract whose value is based on interest rates or interest rate instruments. IRO traded in OTC as well as Exchange Traded market.
- 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.

In subsequent chapters we will learn in detail about Exchange traded interest rate futures and options.

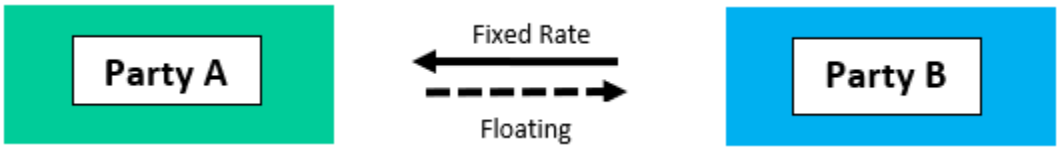
2.2.4 Swaps

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. Swaps help market participants manage risk associated with volatile interest rates, currency exchange rates and commodity prices etc. Most swaps involve cash flows based on a notional principal amount such as a loan or bond, although the instrument can be almost anything. One cash flow is generally fixed, while the other is variable and based on a benchmark interest rate, floating currency exchange rate, or index price etc.

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. Such contracts generally involve exchange of a `fixed to floating' or `floating to floating' rates of interest. On each payment date that occurs during the swap period cash payments based on fixed/ floating and floating rates, are made by the parties to one another.

Example

- "A" will pay Overnight MIBOR & receive fixed rate of 3.75%
- "B" will pay fixed rate of 3.75% p.a. & receive Overnight MIBOR
- Tenor – 1 month
- Notional Value – Rs.100 Crores



Date	Days	Overnight MIBOR	Interest (Rs. In Crores) #
01-Oct-XX	4.00	3.7	0.0405
05-Oct-XX	1.00	3.73	0.0102
06-Oct-XX	1.00	3.7	0.0101
07-Oct-XX	1.00	3.65	0.0100
08-Oct-XX	1.00	3.69	0.0101
09-Oct-XX	3.00	3.73	0.0307
12-Oct-XX	1.00	3.67	0.0101
13-Oct-XX	1.00	3.68	0.0101
14-Oct-XX	1.00	3.63	0.0099
15-Oct-XX	1.00	3.62	0.0099
16-Oct-XX	3.00	3.66	0.0301
19-Oct-XX	1.00	3.65	0.0100
20-Oct-XX	1.00	3.66	0.0100

Date	Days	Overnight MIBOR	Interest (Rs. In Crores) #
21-Oct-XX	1.00	3.49	0.0096
22-Oct-XX	1.00	3.45	0.0095
23-Oct-XX	3.00	3.45	0.0284
26-Oct-XX	1.00	3.47	0.0095
27-Oct-XX	1.00	3.47	0.0095
28-Oct-XX	1.00	3.46	0.0095
29-Oct-XX	4.00	3.48	0.0381
	32.00		0.315817

Interest calculating using daily compounding

Interest Payable by “A” = Rs. 3158169
Interest Receivable by “A” = Rs. 3287671
(100 Crores * 3.75% *32/365)
Net Pay-off for “A” = Rs. 129503
Net Pay-off for “B” = (Rs. 129503)

A **swaption** is an option on swaps. A swaption gives the buyer the right, but not the obligation, to enter into swap. Interest rate swaptions are more popular in the financial market. An Interest Rate Swaption is an option on interest rate swaps. A swaption gives the buyer the right, but not the obligation, to enter into an interest rate swap. A call swaption gives the holder the right to enter an interest rate swap where they receive a fixed rate and pay a floating rate, acting as a "receiver". A put swaption gives the holder the right to enter an interest rate swap where they pay a fixed rate and receive a floating rate, acting as a "payer". Both are options on an interest rate swap, allowing the buyer to pay a premium for the flexibility to enter the swap at a predetermined "strike rate" at a future.

The following table summarizes the key feature of four generic types of derivatives.

Generic derivative	Key feature	Market
Forward	To buy or sell the underlying asset with cash for settlement on a future date. Customized contract.	OTC
Futures	To buy or sell the underlying asset with cash for settlement on a future date. Standardized contract.	Exchange
Swap	To buy or sell returns from the underlying asset with returns from other underlying asset / cash over a period	Mainly OTC

Generic derivative	Key feature	Market
Option	A right to buy or sell on underlying with cash for settlement on a future date	OTC and Exchange

Different kind of derivatives based on underlying

Under lying	Derivatives			
	Forward	Futures	Swap	Option
Interest Rate & Interest Rate Instrument	FRA and Bond forward	Interest rate & Bond futures	Interest rate swap	Interest rate and Bond option, Swaptions
Equity & Equity Indices	Equity forward	Equity futures	Equity swap	Equity option
Currency Pairs	FX forward	FX futures	FX swap	FX option
Commodity	Commodity Forward	Commodity Futures	Commodity swap	Commodity option

Additionally "Credit" risk as underlying, Credit Default Swaps (CDS) are also very popular in the financial market. One counterparty in the CDS contract (the "buyer of protection") makes a regular periodic payment to the other counterparty (the "seller of protection"); in exchange the protection seller agrees to pay the protection buyer any loss in value on the specified reference obligation if a "credit event" (e.g., default) were to occur during the life of the CDS contract.

2.3 Growth Drivers of Derivatives

Over the last three decades, the derivatives market has seen a phenomenal growth. A large variety of derivative contracts have been launched at exchanges across the world. Some of the factors driving the growth of financial derivatives are:

1. Increased volatility in asset prices in financial markets,
2. Increased integration of national financial markets with the international financial markets,
3. A significant growth of derivative instruments has been driven by technological breakthrough. Advances in this area include the development of high-speed processors, network systems and enhanced method of data entry.,
4. Development of more sophisticated risk management tools, providing a wider choice of risk management strategies, and

5. Innovations in the derivatives markets, which optimally combine the risks and returns over a large number of financial assets, leading to higher returns, reduced risk and lower transactions costs as compared to individual financial assets.

2.3.1 Interest Rate Derivatives

Interest rate derivatives are the most important among all derivatives, as shown in the following tables of notional outstanding amount:

Notional Amount Outstanding (USD Billion) in Exchange Traded Derivatives as of March 2025

Exchange Traded Products	Futures	Options
Interest rate	44861	55387
Currency	353	149
Total - All markets	**45214**	**55536**

Source: Bank for International Settlement

Exchange Traded Daily Average Turnover (USD Billion) for year 2024

Exchange Traded Products	Futures	Options
Interest rate	10364	2262
Currency	156	12
Total - All markets	**10520**	**2274**

Source: Bank for International Settlement

Notional Amount Outstanding (USD Billion) in OTC Derivative Products

Product	2024 – S1	2024 -S2
Foreign exchange contracts	129885	130093
Interest rate contracts	578805	548341
Equity-linked contracts	8686	8901
Commodity contracts	2446	2408
Credit derivatives (including Credit default swaps)	9196	9229
Other derivatives	518	505
Total	**729536**	**699477**

Source: Bank for International Settlement

We can see that interest rate derivative outnumber their counterparts in other underlying markets. The reason is quite obvious: every business or corporation faces interest rate risk (and therefore need to use interest rate derivatives) while they need not necessarily face other risks like equity risk, currency risk, etc. In contrast, equity risk is faced only by investment companies with exposure to equity market; currency risk is faced only by those with exports and imports; and commodity risk is faced only by those with exposures to commodities.

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. Interest rate risk management has become very important, and assorted instruments have been developed to deal with interest rate risk.

2.4 Market Participants in Interest Rate Derivatives Market

There are broadly three types of participants in the derivatives market - hedgers, traders (also called speculators) and Arbitragers. Market participants may play different roles in different market circumstances. 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 or to take arbitrage due to price difference in interest rate/interest rate instrument in various markets. 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.

Hedgers

They face risk associated with the prices of underlying assets and use derivatives to reduce their risk. Practically everyone has exposure to interest rate or interest rate related instruments. Hence, all participants can use interest rate derivatives products to hedge or reduce their exposures to interest rates and interest rate instruments. For example, Banks who borrow money in form of deposits and bonds, providing loan for short term and medium term, Mutual Funds and Insurance companies investing in debt instrument, Corporates who borrow money from market in form of loan or debt instrument, Individual who has taken home loan or invested in debt funds etc.

Speculators/Traders

They try to predict the future movements in prices of underlying assets and based on the view, take positions in derivative contracts. Derivatives are preferred over underlying asset for trading purpose, as they offer leverage, are less expensive (cost of transaction is lower than that of the underlying) and are faster to execute in size (high volumes market). In case of interest rate derivatives, trader takes speculative positions based on its views on interest rate.

Arbitragers

Arbitrage is a deal that produces profit by exploiting a price difference in a product in two different markets. Arbitrage originates when a trader purchases an asset cheaply in one location and simultaneously arranges to sell it at a higher price in another location. Such opportunities are unlikely to persist for very long, since Arbitragers would rush in to these transactions, thus closing the price gap at different locations. Similarly in IRD arbitrage may be available between underlying and derivatives market and/or within derivatives market between OTC and derivatives market or between futures and option market.

In India regulators like RBI, SEBI, IRDAI etc. have given detailed guideline about participation of various market participants like Banks, Primary Dealers, Mutual Funds, Insurance Companies, Foreign Portfolio Investors (FPIs) in Interest Rate Derivatives. We will see these guidelines in detail in subsequent chapters.

2.5 Underlying of Interest Rate Derivatives

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. The differences between them are summarized in the following table:

Features	**Interest Rate**	**Notional Bond**	**Single Bond**	**Fixed Income Securities Index**
Underlying	Interest rate on money market benchmark, policy rates, etc. For e.g. derivatives on Overnight MIBOR, Repo Rate, 91-day T-Bills yield etc.	Not a physical bond but theoretical bond with fixed maturity and coupon whose price is inferred from market physically available for bonds. For e.g. derivatives on 10-yr notional Government of India Securities (G-Secs/GOI Bond)	Specific debt securities. For e.g. derivatives on 6.10% GOI 2031 bond	Index based on fixed income securities. For e.g. derivatives on 8-13 year GOI index, Corporate bond indices
Tenor of Underlying	Short term to long term			
Quotation	Generally, interest rate	Yield or price of notional bond	Price of bond	Index Value
Nature of transaction	Participants borrow or lend money at agreed interest rate on future date.	Participant are agreeing to buy or sell notional bond at agreed price on future date	Participant are agreeing to buy or sell debt security at agreed price on future date	Participant are agreeing to buy or sell index at agreed price on future date.
Position	The party that is borrowing money has a long position in terms of interest rate and believes that	The party that is buying the bond / index derivatives has a short position in terms of interest rate. As he believes that the interest rate/yield of bond will go down and price of the bond / index will increase[9]. On the other hand, the party that is selling the bond / index derivatives has a long position in terms of		

[9] Bond prices and yield (i.e. return) have inverse relationship.

Features	Interest Rate	Notional Bond	Single Bond	Fixed Income Securities Index
	underlying interest rate will increase in future. On the other hand, the party that is lending money has a short position and believes that underlying interest rate will decrease in future.	interest rate. As he believes that the interest rate/yield of bond will increase, and price of the bond / index will decrease.		
Settlement	Mainly Cash Settlement	Cash settlement or physical settlement	Cash settlement or physical settlement	Cash settlement
Settlement price	Mainly derived from benchmark rates	Notional bond price is determined by the basket of available deliverable bonds issued in the market	Spot market price of underlying debt securities	Index Value

The following table summarized four generic types of derivatives among interest rate and interest rate instrument derivatives:

Derivative	Interest rate	Interest Rate instrument like Bond
Forward	Forward Rate Agreements (FRA's) are like forward contracts where one party agrees to borrow or lend a certain amount of money at a fixed rate on a pre-specified future date. FRA contracts are usually cash-settled, that is, the money is not actually lent or borrowed. Instead, the forward rate specified in the FRA is compared with the	Bond forward trade, the seller agrees to provide certain debt securities to the acquirer on a mutually agreed date and a specified price and quantity. The settlement of such transactions takes place either by delivery of bonds on the settlement date or through cash settlement, which takes into account price differentials. As per RBI guideline, Bond forward means a rupee interest rate derivative contract in which one counterparty (buyer) agrees to buy a specific government security from another counterparty (seller) on a

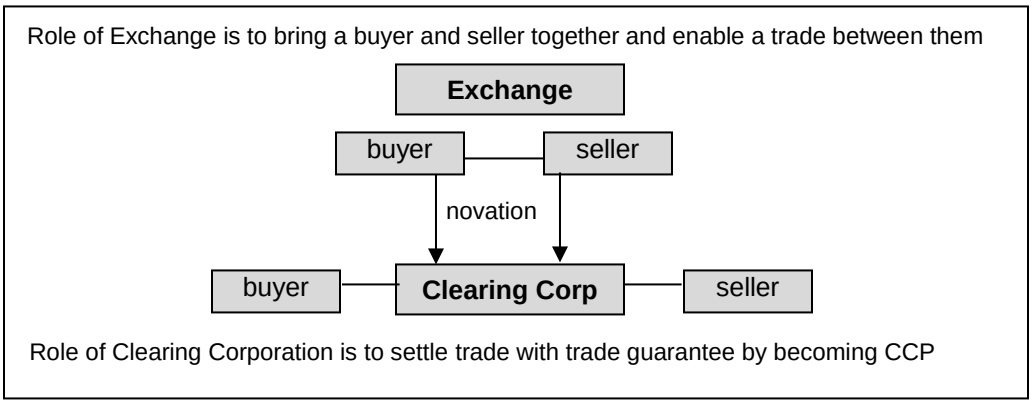
Derivative	Interest rate	Interest Rate instrument like Bond
	benchmark rate and difference is cash settled.	specified future date and at a price determined at the time of the contract.
Futures	Interest rate futures contract is a standardized contract, traded on an exchange, where one party agrees to borrow or lend a certain amount of money at a fixed rate on a pre-specified future date. Similar to FRA, these contracts are usually cash settled.	Interest rate futures contract is a standardized contract, where the seller agrees to provide certain debt securities to the acquirer on a mutually agreed date and a specified price and quantity. The settlement of such transactions takes place either by delivery of bonds on the settlement date or through cash settlement, which takes into account price differentials.
Swap	Interest rate swap is Exchange of a stream of agreed interest payments on a `notional principal' amount during a specified period. Such contracts generally involve exchange of a `fixed to floating' or `floating to floating' rates of interest.	A bond swap is a technique whereby an investor chooses to sell a bond and simultaneously purchase another bond with the proceeds from the sale. Theoretically, it is two underlying bond transaction rather than derivatives contract.
Option	Interest rate option is an option contract between two parties giving the buyer of an option the right, but not the obligation, to borrow or lend money at a specific rate on or before a certain date.	Bond option is an option contract between two parties giving the buyer of an option the right, but not the obligation, to buy or sell bond at a specific price on or before a certain date.

2.6 OTC versus Exchange-Traded Derivatives

Based on the style in which a transaction is negotiated and settled, the market can be classified into two segments: over-the-counter (OTC) and Exchange.

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. There are other differences, too. OTCDs can be customized to the specific requirements of the parties where as ETDs are "standardized" in the sense that the trade amount (called "market lot" or "Contract Amount") and the settlement date (called "expiry date") are pre-determined by the Exchange. Another difference is that OTCDs have counterparty credit risk (which is the

risk of failure of the counterparty before settlement date) and settlement risk (which is the risk of default by the counterparty on settlement date), but both risks do not arise in ETDs because of "trade guarantee" by Clearing Corporation. The trade guarantee is provided by Clearing Corporation becoming a common party, called central counterparty (CCP), to the buyer and seller through the process of novation, as shown below. We say that both buyer and seller novated the original trade to Clearing Corporation so that Clearing Corporation becomes the buyer to the seller; and the seller to the buyer.



Clearing Corporation protects itself from the counterparty credit risk and settlement risk from both buyer and seller by implementing two processes called margining and mark-to-mark, which are discussed in chapter 7. The exchange traded market can offer hedging solution to even small size requirements whereas in OTC market, hedging a very small size requirement may not be possible, or the transaction cost may be prohibitive.

Though ETD has advantages in terms of transparency, elimination of counter party risk, access to all types of market, low cost of trading, credit agnostic etc. there are certain limitation like standardization may lead to imperfect hedge as amount and settlement dates cannot be customized, cash settlement in ETD may not be helpful to actual hedgers, daily MTM and margin may create operational issues to market participants.

Due to increased competition between OTC and Exchange markets, the differences between them are slowly fading. For example, today many derivatives Exchanges abroad offers customized contracts through the facilities of request-for-quote (RFQ) and Exchange-for-Physical (EFP); and OTC market offers both standardized (called "vanilla" products) and customized (called "exotic" products). There are electronic communication networks called "e-trading" platforms in OTC market that does the functions of an Exchange for price discovery and trade execution. Many OTC markets are going through central counterparty (CCP) clearing for multilateral settlements, like in Exchange markets. In India, Clearing Corporation of India Ltd (CCIL) is offering CCP services for settlement with trade guarantee for many OTC interest rate derivative products. The margining and mark-to-market processes of Exchange markets have proved so useful that today OTC market also implements them.

Sample Questions

1. Which of the following is the role of derivatives?
    a. Financing
    b. Cash or liquidity management
    c. **Risk management**
    d. All of the above

2. Which of the following derivatives have the largest market size globally?
    a. Equity derivatives
    b. **Interest rate derivatives**
    c. Currency derivatives
    d. Commodity derivatives

3. _____ take position in Interest Rate Derivatives to reduce interest rate risk.
    a. **Hedgers**
    b. Speculators
    c. Arbitragers
    d. None of the above

4. Which of the following is interest rate derivative?
    a. Forward rate agreement
    b. Interest rate swaps
    c. Interest rate futures
    d. **All of the above**

5. _____ are derivatives with underlying as theoretical bond and not a physical bond.
    a. Single bond Futures
    b. Money market futures
    c. **Notional Bond Futures**
    d. None of the above

CHAPTER 3: EXCHANGE TRADED INTEREST RATE FUTURES

LEARNING OBJECTIVES:

After studying this chapter, you should know about following:

- Understandings of Interest Rate Futures and its pay-off
- Contract Specifications of Interest Rate Futures
- Rationale for Introducing Exchange Traded Interest Rate Derivatives in India
- Advantages and Limitations of Future Contracts in Comparison to FRA
- Interest Rate Futures Price Computation

Introduction

Futures contract

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. A trader, who buys futures contracts generally takes a long position and the one, who sells futures, takes a short position. The words buy and sell are figurative only because no money or underlying asset changes hand, between buyer and seller, when the deal is executed.

Features of futures contract

In futures market, exchange decides all the contract terms of the contract other than price. Accordingly, futures contracts have following features:

- Contract between two parties through Exchange
- Centralised trading platform i.e., Exchange
- Price discovery through free interaction of buyers and sellers
- Margins are payable by both the parties
- Expiry date decided today (standardized)
- Quantity decided today (standardized lot size)

3.1 Interest Rate Futures

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.

For banks, financial institutions and businesses, the exposure to rupee interest rate risk is much more severe than that to currency risk and equity risk. Accordingly, one would

expect that the interest rate derivatives market would be larger than that for currency and equity derivatives. However, in India interest rate derivatives took off only in the third attempt in 2014. Though the OTC interest rate derivatives market has been successful with good volumes for interest rate swaps (Overnight Index Swaps), Exchange-traded interest rate derivatives had not been so successful.

The first attempt in June 2003 launched three futures contracts on 91-day Treasury Bill, 6% 10Y notional bond and zero-coupon 10Y notional bond of Government of India. The launch was not successful, and the contracts were withdrawn soon thereafter. The second attempt was made in August 2009 with launch of bond futures on a notional 7% 10Y GOI bond. As the settlement for the futures was on the basis of a "cheapest-to-deliver" methodology, this was also not adopted by the market. In March 2011, another futures on 91-day Treasury bill was introduced, followed by two more futures on 2Y bond and 5Y bond. The product design of interest rate derivatives launched prior to December 2013 suffered from the drawbacks such as cheapest to deliver, physical settlement, Zero Coupon Yield Curve etc. which led to their failure.

Based on revised guidelines from SEBI and RBI in December 2013, the Exchanges have introduced "cash settled interest rate futures (IRF) on 10-year Government of India Securities. This product is a cash settled single bond futures, based on the on–the–run 10-year GOI bond, and has been a success. Further to this, in June 2015, SEBI and RBI have permitted the exchanges to launch Interest rate futures on 6-year and 13-year GOI securities. Exchanges also launch interest rate futures based on money market instruments. SEBI vide its circular no. SEBI/HO/MRD/MRD-PoD-3/P/CIR/2023/11 dated January 10, 2023, stipulated guideline for "Introduction of futures contracts on Corporate Bond Indices." We will discuss more about cash settled interest rate futures in this chapter. Over all, Exchange-traded derivatives have been more successful in equity and currency than in interest rate markets. However, there is lot of scope for growth of Interest Rate Futures market.

3.1.1 Futures Terminologies

Let us understand various terms in the interest rate futures market.

Underlying Asset: IRF is derivatives, and its value is derived from value/price of certain underlying asset. In this case the underlying can be interest rate (for e.g. Overnight MIBOR) or interest-bearing instrument (Government Securities) or index of interest-bearing instrument (8–13-year G-Sec index, corporate bond index) or notional security (10Y notional Government Securities).

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

Quantity Freeze: Quantity freeze limits are the maximum number of derivatives (options or futures) contracts/lots for an index that can be traded in a single order. These limits

are set by stock exchanges, to maintain market stability by preventing large, unintended orders that could distort prices, and to reduce the chance of "fat finger" errors.

Contract Cycle: It is a period over which a contract trade. The interest rate futures contracts on the SEBI recognized exchanges can be monthly, quarterly in some cases weekly. In case of monthly contract, contract maturing in immediate month is called near month contract, contract expiring in next month is called mid-month contract and subsequent month contract is called far month contract. These contracts can extend up to one year. For different kind of exchange traded interest rate futures we have different contract cycles. For example, for single bond government securities futures, three serial monthly contracts followed by three quarterly contracts of the cycle March/June/September/December are available.

Expiry date: Also called last trading day of contract. It is the day on which trading ceases in the contract. For different kind of exchange traded interest rate futures we have different expiry dates. If the expiry date is a trading holiday the contract expires on the day before. For example, for single bond government securities futures expiry date for monthly contract is last Thursday of the month. In case the last Thursday is a trading holiday, the previous trading day shall be the expiry/last trading day

Tick Size: It is minimum move allowed in the price/rate quotations. For example, if tick size for single bond futures is Rs 0.0025, the price entered by buyer and seller can be Rs 99.9975, Rs 100.0000, Rs 100.0025 (i.e., price changes will be in multiples of Rs 0.0025).

Contract Size / Lot Size: Futures contracts are traded in lots. Contract size specifies the minimum amount of asset that has to be delivered for a single contract. This is also called as lot size.

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 act as reference price for trading for start of the day. Generally, on the first day of trading (i.e., on introduction) of contract, it would be the theoretical futures price. The base price of the contracts on subsequent trading days would be the daily settlement price of the futures contracts as computed by Clearing Corporation.

Price Band: The price range (maximum and minimum price) for the day within which contract can be traded for that day. Generally specified as a +/-% to base price. In many derivatives contracts there is no price band for contracts, in such cases dummy operating range is set to avoid erroneous order entry at non-genuine prices. This dummy operating range are relaxed in the direction of the price movement.

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. The exchange/CC collects these margins (MTM margins) from the loss-making participants and pays to the gainers on day-to-day basis.

Daily Settlement price (DSP): It is required mainly for MTM settlement. The settlement price is weighted average futures price (VWAP) of the trades generally in the last 30 minutes of trading (i.e., close price), if close price is not available then theoretical price.

Final Settlement Price (FSP): All open positions on the last trading day of the interest rate futures contract shall be marked to the final settlement price for the relevant futures contract and shall be settled on final settlement day. Final settlement price / rate is mainly derived from the underlying market.

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. In case of physical settlement, participants have to physically give/take delivery of bonds to settle the open transactions instead of settling them with cash.

Open Interest: An open interest is the total number of contracts outstanding (yet to be settled) for an underlying asset. It is important to understand that number of long futures as well as number of short futures is equal to the Open Interest. This is because total number of long futures will always be equal to total number of short futures. Only one side of contracts is considered while calculating/mentioning open interest. The level of open interest indicates depth in the market.

Positions in derivatives market

As a market participant, you will always deal with certain terms like long, short and open positions in the market. Let us understand the meanings of commonly used terms:

Long position

Outstanding/ unsettled buy position in a contract is called “Long Position”. For instance, if Mr. X buys 5 contracts on single bond futures then he would be long on 5 contracts on single bond futures. If Mr. Y buys 4 contracts on Pepper futures, then he would be long on 4 contracts on pepper.

Short Position

Outstanding/ unsettled sell position in a contract is called “Short Position”. For instance, if Mr. X sells 5 contracts on single bond futures then he would be short on 5 contracts on single bond future. If Mr. Y sells 4 contracts on Pepper futures, then he would be short on 4 contracts on pepper.

Open position

Outstanding/ unsettled either long (buy) or short (sell) position in various derivative contracts is called “Open Position.” For instance, if Mr. X shorts say 5 contracts on 6.10% GOI bond futures and longs say 3 contracts on 91-day T-Bills futures, he is said to be

having open position, which is equal to short on 5 contracts of 6.10% GOI bond and long on 3 contracts of 91-day T-Bills futures. If next day, he sells 2 contracts 91-day T-Bills futures contracts of same maturity, his open position would be short on 5 contracts of 6.10% GOI bond futures contracts and long on 1 contract of 91-day T-Bills futures contract.

Opening a position

Opening a position means either buying or selling a contract, which increases client's open position (long or short).

Closing a position

Closing a position means either buying or selling a contract, which essentially results in reduction of client's open position (long or short). A client is said to be closed a position, if he sells a contract which he had bought before or he buys a contract which he had sold earlier.

Rollover of Position

In derivatives trading, a rollover position indicates that a trader is carrying forward their existing position in a futures contract to the next expiry cycle. This involves closing the current month's contract and simultaneously opening a new position in the next month's contract. It's essentially a way to extend the trading horizon of a position beyond the current expiry date. Rollover is typically expressed as a percentage of total positions. There are no specific benchmarks for rollovers. However, they are compared based on their historical data, generally on the trailing three-month average. On most of the occasions, 'lower-than-average' rollover signals uncertainty, while higher rollovers indicate strong sentiments and the ongoing momentum to continue.

Important points of Futures:

- All open future positions are subject to MTM.
- Future positions can be offset by taking an opposite position (Square off).
- Participant can choose to rollover the future contract if individual wishes to continue with the position. (Rollover is "closing the current month's position and taking the position in the next month's contract)
- Traders need to track positions regularly.
- Trader is solely responsible for maintaining margins.
- Future trade is ZERO sum equation, i.e. profit of a trader is exactly equal to loss of opposite trader.
- Futures trade offers unlimited profit and unlimited losses.

3.2 Pay off Charts for Futures Contract

Pay off Charts

Pay off on a position is the profit/ loss that would accrue to a market participant with change in the price of the underlying asset at expiry. The pay-off diagram is graphical

representation showing the price of the underlying asset on the X-axis and profits / losses on the Y-axis.

Pay off charts for futures

In case of futures contracts, long as well as short position has unlimited profit or loss potential. This results into linear pay offs for futures contracts. Futures pay offs are explained in detail below:

Payoff for buyer of futures: Long futures

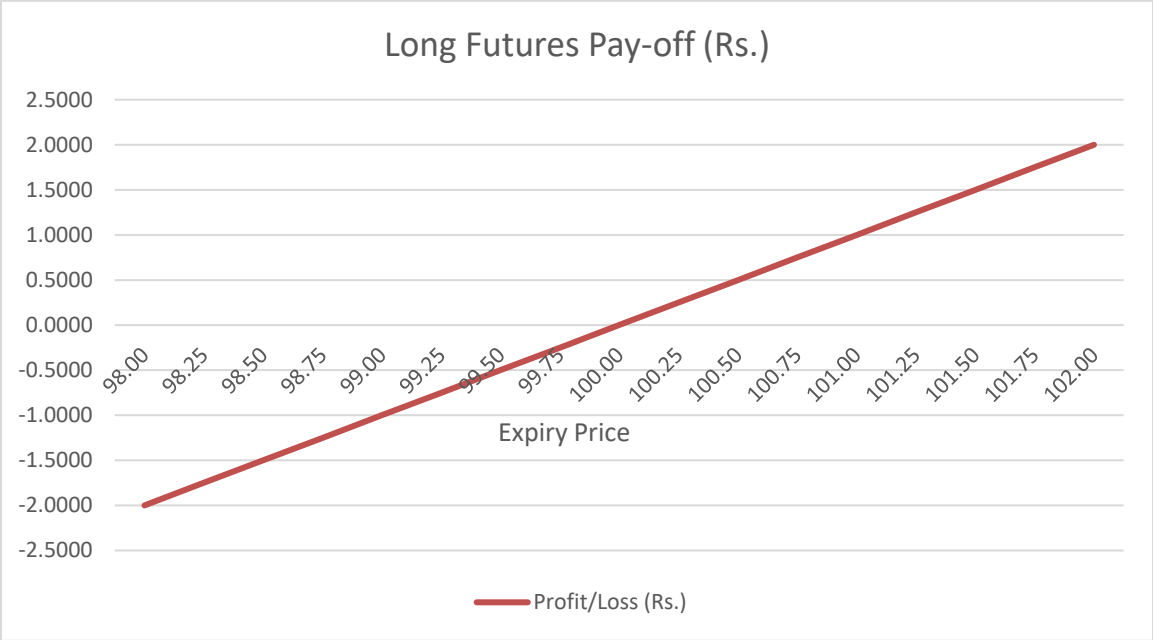
Let us say a person goes long in a futures contract at Rs.100. This means that he has agreed to buy the underlying at Rs. 100 on expiry. Now, if on expiry, the price of the underlying is Rs. 101, then this person will buy at Rs. 100, as per the futures contract and will immediately be able to sell the underlying in the cash market at Rs.101, thereby making a profit of Rs. 1. Similarly, if the price of the underlying falls to Rs. 99 at expiry, he would have to buy at Rs. 100, as per the futures contract, and if he sells the same in the cash market, he will receive only Rs. 99, translating into a loss of Rs. 1. If it is cash settled futures contract then participant will either receive/pay only profit/loss amount i.e., Rs 1 in the above example.

This potential profit/loss at expiry, when expressed graphically, is known as a payoff chart. The X axis has the market price of the underlying at expiry. It increases on the Right-Hand Side (RHS). We do not draw the X axis on the Left-Hand Profit Side (LHS), as prices cannot go below zero. The Y axis shows profit & loss. In the upward direction, we have profits and in the downward direction, we show losses in the chart. So, we can see that long futures position makes profits when prices rise.

The below table and pay off chart show long futures pay offs:

Long Future at Rs. 100	
Market Price at Expiry	**Long Futures Pay-off**
98.0000	-2.0000
98.2500	-1.7500
98.5000	-1.5000
98.7500	-1.2500
99.0000	-1.0000
99.2500	-0.7500
99.5000	-0.5000
99.7500	-0.2500
100.0000	0.0000
100.2500	0.2500
100.5000	0.5000
100.7500	0.7500
101.0000	1.0000

Long Future at Rs. 100	
Market Price at Expiry	**Long Futures Pay-off**
101.2500	1.2500
101.5000	1.5000
101.7500	1.7500
102.0000	2.0000



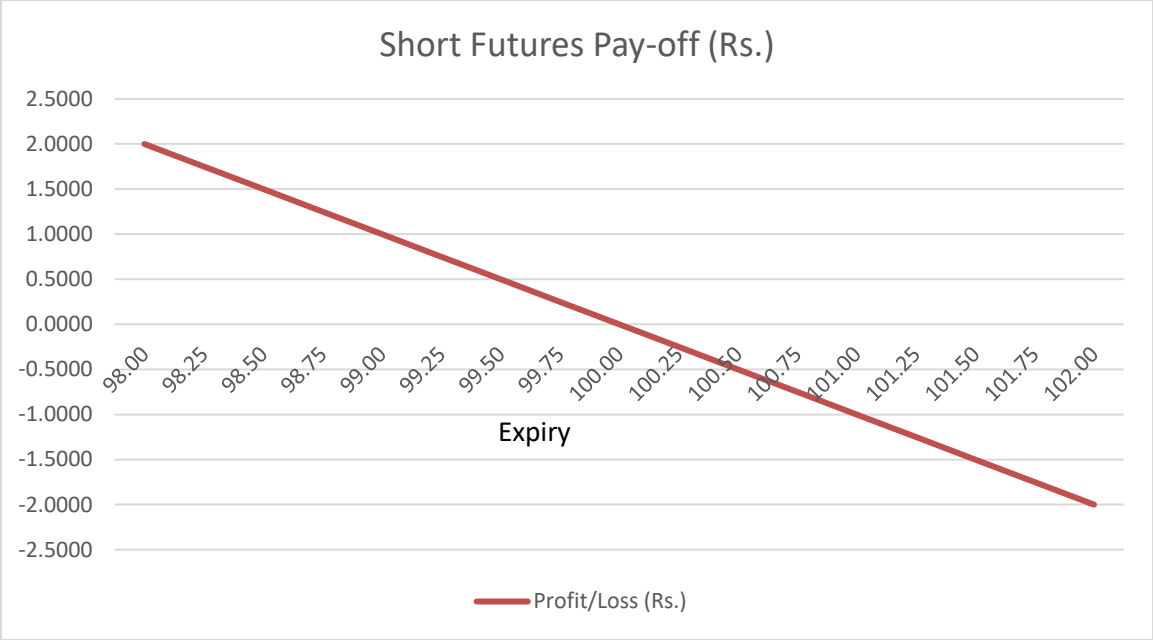
Pay-off for seller of futures: Short futures

Let us say a person goes short in a futures contract at Rs.100. This means that he has agreed to sell the underlying at Rs. 100 on expiry. Now, if on expiry, the price of the underlying is Rs. 99, then the person will buy from underlying in cash market at Rs. 99 and will sell at Rs. 100, as per the futures contract thereby making a profit of Rs. 1. Similarly, if the price of the underlying increase to Rs. 101 at expiry, he would have to buy at Rs. 101, in underlying cash market and sell at Rs. 100 in future market, translating into a loss of Rs. 1. If it is cash settled futures contract then participant will either receive / pay only profit/loss amount i.e., Rs. 1 in the above example. So, we can see that a short futures position would make profits when prices fall.

The below table and pay off chart show long futures pay offs:

Short Future at Rs. 100	
Market Price at Expiry	**Short Futures Pay-off**
98.00	2.0000
98.25	1.7500
98.50	1.5000
98.75	1.2500

Short Future at Rs. 100	
Market Price at Expiry	**Short Futures Pay-off**
99.00	1.0000
99.25	0.7500
99.50	0.5000
99.75	0.2500
100.00	0.0000
100.25	-0.2500
100.50	-0.5000
100.75	-0.7500
101.00	-1.0000
101.25	-1.2500
101.50	-1.5000
101.75	-1.7500
102.00	-2.0000



The payoff graph for futures displays a linear or symmetrical style.

3.3 Contract Specification of Exchange Traded Interest Rate Futures

As discuss earlier in this chapter, based on RBI and SEBI guidelines, various kinds of interest rate futures have been launched by Exchanges in last two decades. Currently Exchange traded interest rate futures are part of interest rate derivatives in the currency derivatives segment of the Exchange. Exchange traded interest rate futures are regulated by SEBI as well as RBI. We will see the regulatory framework of the Interest Rate Derivatives in subsequent chapter. Details of the IRF contracts which are currently active on Exchanges are provided below and also brief details are provided for other interest rate futures contract which were available earlier or which can be introduce by the Exchanges.

Cash Settled Interest Rate Futures (IRF) on 6-year, 10 year and 13-year Government of India (GOI) Security

Underlying	Single GOI Dated Security with following residual maturity 4-8 year 8-11 year 11-15 year GOI Bond is selected by Stock Exchanges in consultation with FIMMDA. For example, futures on 6.33% Central Government Security having maturity in 2035
Unit of Trading	1 Lot - (1 lot is equal to notional bonds of FV INR 2 Lakhs i.e., 2000 bonds)
Quotation	Price based (Trading and settlement at clean price) for FV of Rs. 100/-
Contract Value	Trade Price * 2000
Tick Size	Rs. 0.0025
Base Price	Theoretical future price on 1st day of the contract, on subsequent days, it refers to the daily settlement price of the contract.
Price Band	+/-3 % of the base price (Exchange may expand the price band for that contract by 0.5% in specific direction after 30 minutes after taking into account market trend. Price band may be relaxed only 2 times during the day)
Trading Hours	Monday to Friday: 9:00 a.m. to 5:00 p.m. (Align the trading hours of IRF with that of underlying market in case of change of trading hours of underlying NDS-OM platform)
Trading Cycle	Three serial monthly contracts followed by three quarter ended contracts (Mar, Jun, Sep & Dec)
Expiry Day	Last Thursday of the month. In case the last Thursday is a trading holiday, the previous trading day shall be the expiry / last trading day.
Mode of Settlement	Cash Settlement

Final Settlement Price	Weighted average price of the underlying bond based on the prices during the last two hours of the trading on NDS-OM. If less than 5 trades are executed in the underlying bond during the last two hours of trading, then FIMMDA/FBIL[10] price shall be used for final settlement
Daily Settlement Price	Volume Weighted Average Futures Price of last half an hour across exchanges or theoretical future price
Daily MTM and Final Settlement	T+1

91 Day T-Bills Futures

Underlying	91-day Government of India (GOI) Treasury Bill
Unit of Trading	One contract denotes 2000 units (Face Value Rs.2 lacs)
Quotation	100 minus futures discount yield (y). For example, if the discount yield is 5%, then the price of T-bill futures will be: 100 – 5 = 95.0000
Contract Value	2000 * (100 - 0.25 * y)
Tick Size	Rs. 0.0025
Price Band	+/- 1% of Base Price
Trading Hours	Monday to Friday: 9:00 a.m. to 5:00 p.m. (Similar to underlying market)
Trading Cycle	Three serial monthly contracts & three-quarter end contracts (Mar, Jun, Sep & Dec)
Expiry Day	Last Wednesday of the expiry month at 1.00 pm. In case last Wednesday of the month is a designated holiday, the expiry day would be the previous working day
Daily Settlement Value	Rs.2000 * (100 – 0.25 * Yw) where Yw is weighted average futures yield of last half an hour, in absence of this theoretical futures yield

[10] Financial Benchmark India Pvt. Ltd (FBIL) is an independent benchmark administrator for interest rates and foreign exchange

Final Contract Settlement Value	Rs 2000 * (100 - 0.25 * y) where y is weighted average discount yield obtained from weekly auction of 91-day T-Bill conducted by RBI on the day of expiry
Mode of Settlement	Settled in Cash
Daily MTM and Final Settlement	T+1

Overnight MIBOR (Mumbai Interbank Outright Rate) Futures (Money Market Interest Rate Futures)

Underlying	Daily FBIL Overnight MIBOR for the contract month
Unit of Trading	Interest on notional principal of Rs. 5 crores for one month calculated on 30/365 day basis at a rate equal to average daily FBIL overnight MIBOR for the contract month. Order will be entered in number of contracts
Quotation	Interest Rate
Base Rate	MIBOR OIS rate for the corresponding tenure will be considered to compute base rate on the first day of the contract. On all other days, daily settlement rate will be considered for base rate of the contract
Contract Value	Quoted Rate * 100 * 411 [Value for 1 basis point : Rs. 411 = (Rs. 5 Crores * 0.01% * 30/365]
Tick Size	Quarter basis point (0.25 basis point i.e., 0.0025), Tick value is Rs. 102.75. (0.25*411)
Trading Hours	Monday to Friday: 9:00 a.m. to 5:00 p.m.
Trading Cycle	Three serial monthly contracts & three-quarter end contracts (Mar, Jun, Sep & Dec)
Expiry Day	Last working day of the month. For Expiring futures contract - The market timing on last trading day will be 9:00 am to 10:00 am
Mode of Settlement	Settled in Cash in Indian Rupees

Daily Settlement Price	Volume weighted average rate of trades -In last 30 minutes of trading, subject to min 5 trades else -In last 60 minutes of trading, subject to min 5 trades else theoretical rate would be made applicable.
Final Settlement price	Simple Average of daily FBIL overnight MIBOR rate, up to 4 decimals, applicable for the contract month
Daily MTM and Final Settlement	T+1

Other Interest Rate Futures Contract[11]

10-Year Notional Coupon-bearing Government of India (GOI) Security Futures – Physical Settlement

Underlying	10-year Notional coupon bearing GOI security (Notional coupon of 7% with semi-annual compounding)
Unit of Trading	1 Lot - (1 lot is equal to notional bonds of FV INR 2 Lakhs)
Quotation	The quotation would be similar to the quoted price of GOI security.
Tick Size	INR 0.0025
Trading Hours	Monday to Friday: 9:00 a.m. to 5:00 p.m.
Trading Cycle	The Contract Cycle would consist of four fixed quarterly contracts for entire year, expiring in March, June, September and December.
Expiry Day	Seventh business day preceding the last business day of the delivery month
Mode of Settlement	Physical delivery of deliverable grade securities
Deliverable Grade Securities	GOI securities maturing at least 7.5 years but not more than 15 years from the first day of the delivery month with a minimum total outstanding stock of Rs 10,000 crore.

[11] This IRF are either earlier introduced by the Exchanges and subsequently discontinued or yet to be introduced by Exchanges

Conversion Factor	The Conversion Factor for deliverable grade security would be equal to the price of the deliverable security on the first of the delivery month, to yield 7%
Last Delivery Day	Last business day of delivery month

10-Year[12] Notional Coupon-bearing Government of India (GOI) Security Futures (Cash Settlement)

Underlying	10-year Notional coupon bearing GOI. Each contract there will be Basket of Government of India Securities, with residual maturity between 8 and 11 years on the day of expiry of IRF contract. Coupon of the bond to be decided by the exchange to reflect the interest rate environment during the launch of the contract. Similar to 10-yr notional bond, cash settled IRF can be made available on 6-year and 13-yr notional bonds.
Unit of Trading	1 Lot - (1 lot is equal to notional bonds of FV INR 2 Lakhs)
Quotation	The quotation would be similar to the quoted price of GOI security.
Trading Hours	Monday to Friday: 9:00 a.m. to 5:00 p.m.
Trading Cycle	3 Serial monthly contracts. Additionally, quarterly contracts of March/June/September/December cycle
Expiry Day	Last Thursday of the month. In case the last Thursday is a trading holiday, the previous trading day shall be the expiry / last trading day.
Mode of Settlement	Cash Settled
Final Settlement Price	The final settlement price shall be based on average settlement yield (Ys) which shall be the weighted average of the yields of bonds in the underlying basket where weights will be the assigned weight of the bonds in the underlying basket. For each bond in the basket, yield shall

[12] Similar to 10-yr notional bond, cash settled IRF can be made available on 6-year and 13-yr notional bonds.

	be calculated by determining weighted average yield of the bond based on last two hours of the trading in NDS-OM system. If less than 5 trades are executed in the bond during the last two hours of trading, then FIMMDA/FBIL price shall be used for determining the yields of individual bonds in the basket.

2-year and 5-year Notional Coupon Bearing Government of India Security

Underlying	• Notional coupon bearing 2-year GOI security with a notional coupon of 7% paid semi-annually and face value of Rs. 100. • Notional coupon bearing 5-year GOI security with a notional coupon of 7% paid semi-annually and face value of Rs. 100.
Unit of Trading	1 Lot - (1 lot is equal to notional bonds of FV INR 2 Lakhs)
Quotation	The quotation would be similar to the quoted price of GOI security.
Tick Size	INR 0.0025
Trading Hours	Monday to Friday: 9:00 a.m. to 5:00 p.m.
Trading Cycle	3 Serial monthly contracts.
Expiry Day	Last Thursday of the month. In case the last Thursday is a trading holiday, the previous trading day shall be the expiry / last trading day.
Mode of Settlement	Cash Settled
Final Settlement Price	The settlement price of the notional bond would be determined on the basis of the yields of a basket of eligible bond(s) selected by the exchange with the yields of the bonds in the basket to be determined through a polling process carried out by Fixed Income, Money Market and Derivatives Association (FIMMDA)

Basket of Eligible Bonds	2-Yr Notional Bond: Eligible bonds would comprise of GOI securities maturing at least 1.5 years but not more than 2.5 years from the expiry day. 5-Yr Notional Bond: Eligible bonds would comprise of GOI securities maturing at least 4.5 years but not more than 5.5 years from the expiry day.

Interest Rate Futures based on Corporate Bond Index

SEBI vide its circular dated January 10, 2023 has decided to permit stock exchanges to introduce derivatives contracts on indices of corporate debt securities rated AA+ and above. Product design and risk management framework for Cash Settled Corporate Bond Index Futures (CBIF) is given below:

1. Permitted Corporate Bond Index

The index underlying the derivative contract shall be as per the following:

- The index shall be composed of corporate debt securities.
- Constituents of the index should have adequate liquidity and diversification at issuer level, as decided by the stock exchanges.
- Constituents of the index shall be periodically reviewed (at least on half-yearly basis).
- Constituents of the index shall be aggregated at issuer level for the purpose of determining exposure limits for single issuer, group, sector, etc.
- Single issuer shall not have more than 15% weight in the index.
- There shall be at least 8 issuers in the index.
- The index shall not have more than 25% weight in a particular group of issuers [excluding securities issued by Public Sector Undertakings (PSUs), Public Financial Institutions (PFIs) and Public Sector Banks (PSBs)].
- The index shall not have more than 25% weight in a particular sector (excluding securities issued by PSUs, PFIs and PSBs).
- The duration buckets of the index may be decided by the stock exchanges.
- The index shall have a track record of at least one year.

2. Contract Value

The value of the CBIF contracts shall not be less than INR 2 lakhs at the time of introduction. Stock exchanges shall review the contract value or lot size on half-yearly basis and may make revisions, if required, by giving an advance notice to the market.

3. Trading Hours

The trading hours shall be between 9:00 AM and 5:00 PM on all working days from Monday to Friday. Exchanges shall align the trading hours of CBIF with the trading hours

of the underlying market. Stock exchanges and clearing corporation(s)shall have infrastructure and risk management systems in place which are commensurate to the trading hours.

4. Tenure of the Contracts

- Tenure: The stock exchanges may introduce contracts of up to a tenure of 3 years.
- Contract Cycle: Weekly, three Serial monthly contracts, one quarterly contract of the cycle March/June/September/December or one half-yearly contract of the cycle June/December.

5. Quotation and Tick value

The quotation shall be in Indian Rupee. The Tick value shall be decided by the stock exchanges based on the underlying index values or contract size, etc.

6. Contract Expiry

The expiry or last trading day for the contract shall be the last Thursday of the expiry cycle. If any expiry day is a trading holiday, then the expiry or last trading day shall be the previous trading day.

7. Daily Settlement Price

The daily settlement price shall be the last half an hour volume weighted average price of the contract. In the absence of last half an hour trading, theoretical price shall be considered. The methodology used for the theoretical price computation shall be published on the stock exchange website.

8. Final Settlement Price

Final settlement price for the derivative contracts shall be the closing price of the underlying index on the expiry day or last trading day of such derivative contracts.

9. Settlement Mechanism

The contracts would be settled in cash in Indian Rupee (INR)

10. Settlement Day

MTM and final settlement will be next working day.

3.4 Lot Size, Tick Size and Change in Contract Value for each Tick change

Interest rate futures trading is done in lot size. In IRF, for different kind of contracts, different lot sizes are applicable, as given below:

3.4.1 Cash Settled GOI Bond Futures:

Contract size is Rs 200,000 of face value of GOI securities which is equivalent to 2000 units of that security. Because the face value will always be an integral multiple of Rs 2 lakhs, we cannot buy or sell for amounts like Rs 3 lakh, Rs 5 lakh, etc. In contrast, the market lot in the cash market of wholesale debt market is Rs 5 Crores (which is equal to 250 futures contracts). The face value and market value are linked by the market price. In both cash and futures markets, the prices are quoted for Rs 100 face value so that the relation between face value and market value is:

Market Value = Face Value × (Market Price / 100)
Now in case of IRF, contract value for 1 lot = 2000 * trade price.
For example, if participant buys 5 lots of single bond futures at Rs. 101:
Contract value = 5*2000*101 = Rs. 10,10,000.

In case of cash settled GOI bond futures tick size is Rs. 0.0025 which is same as underlying market. Hence, the minimum price movement will be +/- Rs. 0.0025. For example, if price is Rs. 101, then next price can be either 101.0025 or 100.9975.

So, change in contract value for each tick size change for one lot = 1*2000*0.0025= Rs.5.

Contract value is important for determining margin amount, transaction charges, regulatory charges etc.

3.4.2 91 Day T-Bills Futures

One contract denotes 2000 units (Face Value Rs.2 lacs). Price quotation is 100 minus futures discount yield (y), and contract value is 2000 * (100 - 0.25 * y)

For example, if a participant buys 10 lots of 91-day T-Bills futures at Rs. 95, then:
Future discount yield = 5% (100-95)
Contract Value = 2000*(100-0.25*5)*10 = 19,75,000

In case of cash settled 91 Day T-Bills futures tick size is Rs. 0.0025. Hence, the minimum price movement will be +/- Rs. 0.0025. For example, if price is Rs. 95, then next price can be 95.0025 or 94.9975.

Change in contract value for tick size change for one lot = 1*2000*0.0025*0.25= Rs1.25.

3.4.3 Overnight MIBOR Futures

One contract denotes interest on notional principal of Rs. 5 crores for one month calculated on 30/365 day basis. Price quotation is in interest rate and contract value per lot is Quoted Rate * 100 * 411 [Value for 1 basis point: Rs. 411 = (Rs. 5 Crores * 0.01% * 30/365).

For example, if a participant borrows / buys 10 lots of Overnight MIBOR futures at 4.50% (quotation is in interest rate for MIBOR futures), then:
Contract Value = 4.50*100*411*10 = 18,49,500.

For Overnight MIBOR futures, tick size is 0.0025 (i.e., 0.25 basis point). Hence, the minimum rate movement will be +/- 0.0025. For example, if rate is 4.50, then next rate can be 4.5025 or 4.4975.

Change in contract value for tick size change:
for one lot = (Rs. 5 Crores * 0.0025% * 30/365 = Rs. 102.75/- (i.e., 411/4=Rs. 102.75)

3.5 Rationale for Introducing Exchange Traded Interest Rate Derivatives in India

Interest rate risk affects not only the financial sector, but also the corporate and household sectors. As observed in the report on Interest Rate Futures, banks, insurance companies, primary dealers and provident funds bear a major portion of the interest rate risk on account of their exposure to government securities. As such these entities need a credible institutional hedging mechanism. Today, with a large stock of household financial savings on the assets side and an increasing quantum of housing loans on the liabilities side, interest rate risk is becoming increasingly important for the household sector as well. Moreover, because of the Fisher effect[13] , interest rate derivatives products are the primary instruments available to hedge inflation risk which is typically the single most important macroeconomic risk faced by the household sector. In this context, therefore, it is important that the financial system provides the household sector greater access to interest rate risk management tools through Exchange-Traded interest rate derivatives.

The key public policy objective in introducing IRF is to take a step closer to market completion, i.e., to expand the set of hedging tools available to financial as well as non-financial entities against interest rate risks. The IRF was introduced with the objective that is beneficial for the target users.

Interest rate volatility in a liberalized financial regime affects all economic agents across the board – corporates, financial institutions and individuals, underscoring the need for adequate hedging instruments to facilitate sound economic decisions. OTC segment of interest rate derivatives are the preponderant segment world-wide, the desirability of exchange-traded products for wider reach with an almost zero counterparty, credit &

[13] "Fisher effect" implies that ceteris paribus, increase in expected inflation rate leads to an increase in the nominal interest rate.

settlement risks, full transparency etc., are compelling reasons for its introduction as a complementary product. Introduction of IRF market with a view to providing a wider repertoire of risk management tools and thereby enhance the efficiency and stability of the financial markets.

The broader group of economic agents comprising banks, primary dealers, insurance companies and provident funds between them carry more than 80 per cent of interest rate risk exposure of GOI securities. This is then the largest constituency that needs a credible institutional hedging mechanism to serve as a 'true hedge' for their colossal pure-time-value-of-money / credit-risk-free interest rate-risk exposure. Although Overnight Index Swap is one such hugely successful and traded IRD instrument for trading and managing interest rate risk exposure, it does not at all answer the description of a 'true hedge' to the colossal exposure represented by the outstanding stock of GOI securities. Further, it needs no emphasis that government securities yield curve being the ultimate risk free sovereign proxy for pure time value of money, delivers all over the world, without exception, the most crucial and fundamental public good function / role in the sense that all riskier financial assets are valued / priced off it at a certain spread over it. Hence, it is very important to have liquid and efficient hedging instrument in form of Exchange traded interest rate derivatives.

3.6 Advantages and Limitations of Future Contracts in Comparison to FRA

Forward contracts are often confused with futures contracts. The confusion is primarily because both serve essentially the same economic functions of allocating risk in the probability of future price uncertainty. However, futures have some distinct advantages over forward contracts as they eliminate counterparty risk and offer more liquidity and price transparency. However, it should be noted that forwards enjoy the benefit of being customized to meet specific client requirements.

Forward Rate Agreements (FRAs) are like forward contracts where one party agrees to borrow or lend a certain amount of money at a fixed rate on a pre-specified future date. In the FRA the underlying is mainly certain benchmark interest rate. It is a bilateral OTC transaction between two parties. The party that is borrowing money under the FRA has a long position in terms of interest rate, and the party that is lending money has a short position in terms of interest rate in the FRA. FRA contracts are usually cash-settled, that is, the money is not actually lent or borrowed. Instead, the forward rate specified in the FRA is compared with the benchmark rate. If the benchmark rate is greater that the FRA rate, then the long is effectively able to borrow at a below market rate. The long will therefore receive a payment based on the difference between the two rates. If, however, the benchmark rate was lower than the FRA rate, then long will make a payment to the short.

Interest rate futures contract is standardized interest rate derivative contract, 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. So, the underlying can be benchmark interest rate, interest rate instrument, index of such instrument or interest rate. In case the underlying for interest rate future is benchmark interest rate then long and short position is generally similar to FRAs. However, if the underlying is bond or index based on fixed income securities, then the party that is buying the futures has a long position in bond (i.e., short position in terms of interest rate) as he believes that the interest rate/yield of bond will go down and price of the bond / index will increase. On the other hand, the party that is selling the bond futures has a short position in bond (i.e., long position in terms of interest rate) as he believes that the interest rate/yield of bond will increase, and price of the bond / index will decrease.

Comparison of FRAs and Interest Rate Futures

Parameters	**Forward Rate Agreements**	**Interest Rate Futures**
Operational mechanism	Mainly bilateral over-the-counter (OTC) transactions. Can be traded on electronic trading platform.	Contract between two parties through centralized trading platform of Exchanges
Terms of Contracts	Non- Standardized. Each Contract is custom designed and hence unique in terms of contract size, expiration date, asset quality, asset type etc.	Standardized Contract
Underlying	Usually interest rate	Interest rate, interest rate instruments, index based on such instrument or interest rates
Price Discovery	Mainly through negotiation. Not efficient.	Price discovery through free interaction of buyers and sellers on centralized trading platform
Liquidation Profile	Low, as contracts are tailor made catering to the needs of the parties involved. Further, contracts are not easily accessible to other market participants	High, as contracts are standardised exchange-traded contracts.
Market Maker	Scheduled Banks, PDs, AIFIs are eligible to act as market maker	Currently not applicable

Parameters	Forward Rate Agreements	Interest Rate Futures
Settlement	Mainly bilateral settlement by parties. Usually cash settlement	Clearing and Settlement through clearing corporation with guaranteed settlement. Cash settled or physical settlement
Quality of information and dissemination	Reporting of trade to the trade repository within 30 minutes	Futures are traded nationwide. Information is available online on trading platform and websites.
Advantages	• Since customized product can provide perfect hedge. • Less operation issues related to margin and mark to market settlement	• 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	• Liquidity risk • Counter party risk • Not accessible for all kind of market participants	• May lead to imperfect hedge as amount and settlement dates are standardized. • Operational issues related to mark-to-mark settlement and margin

3.7 Interest rate futures price computation

Let us understand few concepts before understanding computation of price for interest rate futures contract.

3.7.1 Important Concept

3.7.1.1 Forward Rate

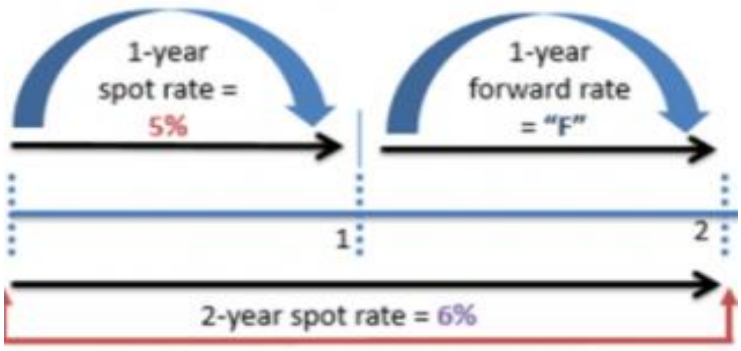
A forward rate is an interest rate applicable to a financial transaction that will take place in the future. Forward Rate can be determined using spot rate. In an efficient market, the same returns are received for investment made over one long term or multiple shorter terms by reinvesting the maturity proceeds. For example, two year returns would be same if invested in a two year bond or by investing in a one year bond and reinvesting again for the subsequent year. The same logic can be extended for a three year bond also. In this case it is seen that there is a defined relation between the spot rates for 1 year, 2 years

and 3 years, to get the expected forward spot rate for one and two years in one year's time and the expected spot one-year rate in two years' time.

Forward rate example:

Investor wants to invest INR 1000 for two years. He is faced with two options:

- Directly invest in a 2-year bond @ 6% (S1)
- Invest in a one-year bond @5%(S2), and again invest the proceeds after one year in a one-year bond (let assume "F" is one year forward rate one year from now)



In no-arbitrage case return will be same from both the options

- Value of investment in option 1 after 2 years:

  $= 1000*(1+6\%)^2 = \text{INR } 1123.60$

- Value of investment in option 2 after 2 year

  $= \{1000*(1+5\%)^1\} * (1+F\%)^1$

- If there are no arbitrage opportunities, both these values should be the same

  $1000*(1+6\%)^2 = \{1000*(1+5\%)^1\} * (1+F\%)^1$

  Gives, F = 7.0095%

- Forward Rate (F) = $\{ [(1 + S1)^{n1} / (1 + S2)^{n2}]^{1/(n1-n2)} \} - 1$

  S1 = Spot rate until a further future date

  S2 = Spot rate until a closer future date

  n1 = No. of years until a further future date

  n2 = No. of years until a closer future date

Suppose there is different compounding frequency (half yearly, quarterly, continuous compounding) then formula will change accordingly.

For example, 6 month spot rate is 5.60% and one year spot rate is 5.85%, then the 6 month forward rate 6 month from now would be calculated as ((((1+5.85%/2)^(2*1))/(1+5.60%/2)^(2*.5)) – 1) *2 = 6.10%.

3.7.1.2 Financing Cost / Cost of Carry

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.

3.7.1.3 Income on cash position

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. The component of coupon payment and interest on coupon payment invested are applicable in case of any coupon payments falling during the holding period.

3.7.1.4 Basis

The difference between spot price and future price is called basis. If future price is greater than spot price (FP > SP), then the 'Basis' is negative value. Negative basis occurs when the futures price is higher than the spot price. This situation is often observed in markets experiencing contango and can indicate expectations of increased supply or decreased demand in the future. If future price is lesser than spot price (FP < SP) then the 'Basis' is positive value. Positive basis occurs when the spot price is higher than the futures price. This is characteristic of markets in backwardation and may signal strong current demand or tight supply.
In bond futures we observed that most of the time basis is positive as income on cash position is more than the financing cost.

3.7.2 Computation of price for bond futures

The future price computation for single bond future is based on the concept of there is no arbitrage between underlying and future bond price.

So, the future bond price = Cash Price + financing cost – income on cash position

Example of bond future price:

Last Interest payment date: 29-04-20XX
Coupon Rate: 5.75%

Trade Date	03-08-20XX
Settlement Date (G-Secs are settled on T+1 basis)	04-08-20XX
Clean Price of GOI Security	Rs. 101.5000
Accrued Interest (30/360 days basis for G-secs) **(Applicable from April 29 to August 4)**	Rs. 1.5174
Dirty Price / Cash Price (A)	Rs. 103.0174

Financing Cost (%) (Applicable on Dirty Price from August 04 till August 27)	4%
Cost of Borrowing (B) (Actual/365 basis)	Rs. 0.2597
Contract Expiry Date	26-08-20XX
Contract Settlement Date	27-08-20XX
Theoretical Future Dirty Price (A) + (B)	103.2771
Accrued Interest i.e., Income on cash position (C) **(Applicable from April 29 to August 27)**	1.8847
Theoretical Future Clean Price = (A) + (B) – (C)	101.3924

Note: Cost of borrowing of funds[14], return on investment, etc. are different for the different market participants. The number of fair values of futures can be equal to the number of market participants in the market. Perhaps the difference among the fair values of futures contracts and non-arbitrage found for different market participants is what makes the market on continuous basis.

Assumptions in above model

The above model of futures pricing works under certain assumptions. The important assumptions are stated below:

- Underlying asset is available in abundance in cash market.
- Holding and maintaining of underlying asset is easy and feasible.
- Underlying asset can be sold short.
- No transaction costs.
- No taxes.
- No margin requirements.

[*This is not an exhaustive list of the assumptions of the model but is the list of important assumptions]

The assumption that underlying asset is available in abundance in the cash market i.e., we can buy and/or sell as many units of the underlying assets as we want. When an underlying asset is not storable i.e., the asset is not easy to hold/maintain, then one cannot carry the asset to the future. The cash and carry model is not applicable to these types of underlying assets. Similarly, many a times, the underlying may not be sold short. Even though this simple form of model does not discount for transaction cost, taxes etc. We can always upgrade the formula to reflect the impact of these factors in the model. Margins are not considered while delivering the fair value/ synthetic futures value. Thus, no generalized statement can be made with regard to the use of this model for pricing

[14] It is observed that the bond future price is generally trade at discount to future price as cost of borrowing is lower than income received on bond

futures contracts. Assumptions of the model and characteristics of underlying asset can help us in deciding whether a specific asset can be priced with the help of this model or not.

3.7.3 Expectancy model of futures pricing

According to the expectancy model, it is not the relationship between spot and futures prices but that of expected spot and futures prices, which moves the market, especially in cases when the asset cannot be sold short or cannot be stored. It also argues that futures price is nothing but the expected spot price of an asset in the future. This is why market participants would enter futures contract and price the futures based upon their estimates of the future spot prices of the underlying assets.

According to this model,

- Futures can trade at a premium or discount to the spot price of underlying asset.
- Futures prices give market participants an indication of the expected direction of movement of the spot price in the future.

For instance, if futures price is higher than spot price of bond, market participants may expect that interest rate will go down in near future leads to reduction in yield of security and may expect spot price to go in future. Similarly, if futures price is lower than spot price of bond, market participants may expect that interest rate will rise in near future leads to increase in yield of security and may expect spot price to go down in future.

3.7.4 Price Discovery and Convergence of Cash and Futures Prices on the Expiry

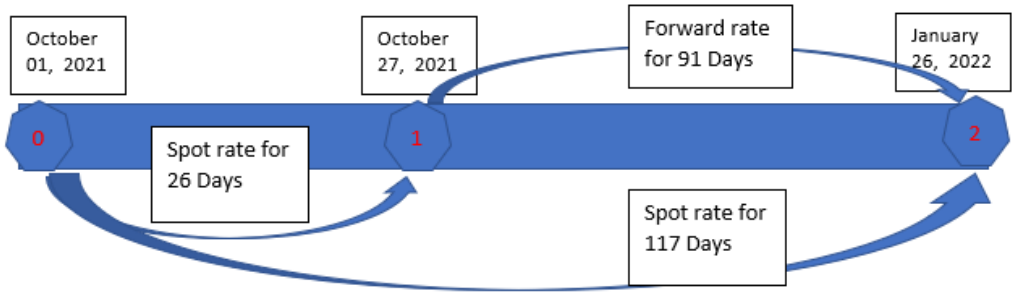
It is important to understand what actually futures prices indicate. For instance, if say October 2021 expiry contract of 6.10% Central Government security 2031 maturity is trading at Rs. 98.50 in September 2021. What does it mean? We can explain this by saying that that market expects the spot price of above GOI security to settle at Rs. 98.50 at the closure of the market on last Thursday of October 2021 (i.e., on the last trading day of the contract which is October 28, 2021). Point is that every participant in the market is trying to predict the price at a single point in time i.e., at the closure of the market on last trading day of the contract, which is Thursday in our example. Now, we may also state that futures prices are expected spot price of the underlying asset, at the maturity of the futures contract. Accordingly, both futures and spot prices converge at the maturity of futures contract, as at that point in time there cannot be any difference between these two prices. This is the reason all futures contracts on expiry settle at the underlying cash market price. This principal remains same for all the underlying assets.

3.7.5 Computation of price for 91-day T-Bills futures

Forward rate concept can also be used to arrive the price of IRF contracts. For example, 91 day T-Bills futures as the underlying is notional 91 day T-Bills and participants are predicting the yield of 91 Day T-Bill on expiry date i.e., future date.

Example:
Contract: 91-Day T-Bills Future
Trade Date: 1st October 2021

Expiry Date of Contract: 27th October 2021
91-Day forward rate, 26 days from 1st October can be calculated using latest available treasury bills yield curve published by FBIL of various tenors.



In above example, on October 01, 2021, participants first determine the yield/rate for 26 days and 117 days. In case of yield of required tenor i.e. yield of 26 days and 117 days is not available on T-Bills yield curve published by FBIL, participant may use interpolation/extrapolation to compute the yield of 26 days and 117 days. And then using forward rate formulae, we can determine 91 day yield/rate on October 27, 2021.

It is important to note that the pricing models provided above are theoretical and based on certain assumptions.

Sample Questions

1. What is the settlement method for 91-day bill futures?
    a. **Cash**
    b. Physical
    c. Can be cash or physical
    d. None of the above

2. Which of the following is the last trading day for cash settled 10-year bond futures?
    a. Two business days after the first business day of the Expiry Month
    b. Two business days before the last business day of the Expiry Month
    c. Seven business days before the last business day of the Expiry Month
    d. **Last Thursday of Contract Month**

3. Total number of derivatives contracts outstanding is called _____
    a. Long position
    b. Short position
    c. **Open interest**
    d. None of the above

4. Person goes short in a futures contract at Rs.100 and on expiry underlying price is Rs. 101, he will _____.
    a. Make profit of Rs. 1
    b. **Make loss of Rs. 1**
    c. No profit no loss
    d. None of the above

5. If participant buy 10 lot of single bond futures at Rs. 99, then contract value _____.
    a. Rs. 20,00,000
    b. Rs. 19,99,000
    c. **Rs. 19,80,000**
    d. None of the above

CHAPTER 4: EXCHANGE TRADED INTEREST RATE OPTIONS

LEARNING OBJECTIVES:

After studying this chapter, you should know about following:

- Understanding of Options and Option Terminology
- Understanding of Option Pricing, Implied Volatility and Option Greeks
- Options Pay-offs and Moneyness of an Option
- Contract Specifications of Exchange Traded Interest Rate Options
- Advantages and Limitations of Exchange Traded Interest Rate Options

4.1 Basics of Options

As seen in earlier section, 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.

Let us understand this with an example:
Mr. X is looking to buy 1 acre of land from Mr. Y. The land is valued at Rs.10,00,000. Mr. X has informed that in next 3 months the infrastructure project is expected near the land and value of land bound to increase. However, if the news turns out to be a rumour, then Mr. X would be stuck with a useless piece of land.
What should X do???

- Mr. X pays an upfront fee of Rs. 50,000 today i.e., August 01, 2021, to Mr. Y. Consider this as a non-refundable
- Against this fees, Mr. Y agrees to sell the land after 3 months to Mr. X
- The price of the land (which is expected 3 months later) is fixed today at Rs.10,00,000
- Mr. X has paid an upfront fee and hence only he can call off the deal at the end of 3 months, Mr. Y cannot.
- In the event Mr. X calls off the deal at the end of 3 months, Mr. Y gets to keep the upfront fees

The above arrangement between Mr. X and Mr. Y is called as option contract. We could define option contract as below:

An option is a contract between two parties giving the buyer of an option the right, but not the obligation, to buy or sell an underlying asset at a specific price on or before a certain date.

We will now use the above example, to define certain important terms relating to options:

- The right to buy the asset is called **call option** and the right to sell the asset is called **put option**. In the above example Mr. X has received right to buy the land, hence it is a call option transaction.
- The pre-specified price at which the underlying asset may be purchased or sold by the option holder is called as **strike price.** In above example the same is set as Rs.10,00,000.
- The date at which the option contract will expire / or ceases to exist is called **expiration date**. In this case October 31, 2021 (3 months from trade date) is the contract expiration date.
- The difference between the date of entering into the contract and the expiration date is called **time to maturity** which is 3 months in the above example.
- 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**. In above case Mr. X is option buyer and Mr. Y is option seller.
- The price which option buyer pays to option seller to acquire the right is called as **option price or option premium.** In above case, Rs. 50000 is the option premium**.**
- The asset which is bought or sold is an underlying or **underlying asset** which is Land in above case.
- 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. In the above example, of price of land on October 31, 2021, is Rs. 15 lacs, Mr. X will exercise its option as he will pay only Rs. 10 lacs to buy the land.

Let us also take a real-life example of a put option. When you get your car insured, you pay an insurance premium to the insurance company and the insurance company guarantees to compensate you for the damages to your car during the insurance period. In this example, you are buying a put option from the insurance company and paying it an option premium in the form of insurance premium. If your car gets damaged during the insurance period, you can use your policy to claim the compensation and if all goes well and you do not need to claim the compensation, the insurance company keeps the premium in return for taking on the risk.

4.2 Difference between futures and options

Let us first highlight the similarities between two types of derivative contracts – Futures and Options. The similarities are as follows:

- Both the contracts have a buyer and a seller
- Both the contracts have a set price for the underlying asset
- Both the contracts have a set settlement date

Just like futures, options can be used for hedging, or to generate returns by taking a view on the future direction of the market, or for arbitrage.

The difference between two contracts is that in futures both the parties are under right as well as obligation to buy or sell and therefore face similar risk. Whereas in options, the buyer has only rights and no obligation and therefore he faces only the risk of premium paid. On the other hand, option seller is under obligation to buy or sell (depending on whether put option is sold or a call option is sold, respectively) and therefore faces unlimited risk. At the same time, the option buyer has chances to get unlimited upside and the option seller has limited upside equal to the premium received. The call option buyer would exercise the option, only if the price of underlying asset is higher than the strike price. Similarly, the put option buyer would exercise the option, only if the price of the underlying asset is less than the strike price.

4.3 Style of options

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. Before exercising an option, it is important to consider what type of option you have and whether you can exercise it. Based on when the buyer is allowed to exercise the option, Options are classified into two types:

- **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. However, please note that in case of exchange traded options, participants can sell their option in the secondary market prior to option expiration date to square-off their position.
- **American options**: American options can be exercised by the buyer any time on or before the expiration date. American options offer more flexibility to option buyer as they can be exercised on any trading day prior to their expiration.
- **Bermuda options**: Bermudan options are different from both American and European options. The contract for a Bermudan-style option denotes specific days before expiration on which the trader can exercise his option. The specified exercise dates are usually near the time of the option's expiration date. Thus, Bermudan options fall in between American and European options in terms of how much freedom a trader has to exercise the option.

4.4 Moneyness of an option

The buyer of call option would exercise his right to buy the underlying asset only if the spot price of underlying asset is higher than the strike price at the maturity of the contract. Similarly, the buyer of a put option would exercise his right to sell the underlying asset only if the spot price of underlying asset is lower than the strike price at the maturity of the contract. In certain cases, transaction/regulatory charges are applicable at the time of exercise. If these costs are included, the decision of the option buyer would take into account these costs also. Moneyness of an option indicates whether the contract would

result in a positive cash flow, negative cash flow or zero cash flow for the option buyer at the time of exercising it. Based on these scenarios, moneyness of option can be classified in three types:

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. Thus, a call option would be in the money, if underlying price is higher than the strike price and similarly a put option would be in the money, if underlying price is lower than the strike price.

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. Thus a call option would be out of the money, if underlying price is lower than the strike price and similarly a put option would be out of the money, if underlying price is higher than the strike price.

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. Any movement in spot price of underlying from this stage would either make the option ITM or OTM.

Strike	Call Option	Put Option
In-the-money	Strike price < Spot price of underlying asset	Strike price > Spot price of underlying asset
At-the-money	Strike price = Spot price of underlying asset	Strike price = Spot price of underlying asset
Out-of-the-money	Strike price > Spot price of underlying asset	Strike price < Spot price of underlying asset

4.5 Basics of Option Pricing and Option Greeks

4.5.1 Option Value:

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 i.e., the amount an option buyer will realize, before adjusting for premium paid, if he exercises the option instantly. Therefore, only in-the-money options have intrinsic value whereas at-the-money and out-of-the-money options have zero intrinsic value. The intrinsic value of an option can never be negative. Thus, for call option which is in-the-money, intrinsic value is the excess of spot price (S) over the exercise price (X). Thus, intrinsic value of call option can be calculated as S-X, with minimum value possible as zero because no one would like to exercise his right under no advantage condition.

Similarly, for put option which is in-the-money, intrinsic value is the excess of exercise price (X) over the spot price (S). Thus, intrinsic value of put option can be calculated as: X-S, with minimum value possible as zero.

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.

The time value reflects the probability that the option will gain in intrinsic value or profitable to exercise before its maturity. Therefore, higher time to expiration, higher the probability and higher the time value. Please note that at expiry the option value is its intrinsic value and time value will be zero.

4.5.2 Option Pricing Fundamentals

On what basis did market participants come to these values of the premiums? What are the parameters that affect these values? Are these fixed by the stock exchanges or by SEBI? The answer lies in understanding what affects options. Prices are never fixed by stock exchanges or SEBI or anybody for that matter. In fact, price discovery is a very critical and basic component of markets. Stock exchanges only provide a platform where buyers and sellers meet, and SEBI's role is to ensure smooth functioning of our markets.
Any option's value increases or decreases depending upon different variables. Each variable has its impact on an option. The impact can be same or different for a call and put option. As explained in the earlier section, option premium is the sum of intrinsic value and time value. As long as the option is not expired, there will always be some time value. Intrinsic value may or may not be there, depending upon whether the option is ITM, ATM or OTM. Time value of the option in turn depends upon how much time is remaining for the option to expire and how volatile is the underlying.

Thus, there are five fundamental parameters on which the option price depends:
1) Spot price of the underlying asset
2) Strike price of the option
3) Volatility of the underlying asset's price
4) Time to expiration
5) Interest rates

These factors affect the premium/ price of options (both American & European) in several ways.

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.

Higher volatility = Higher premium, Lower volatility = Lower premium (for both call and put options).

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. If all other factors affecting an option's price remain same, the time value portion of an option's premium will decrease with the passage of time. This is also known as time decay. Options are known as 'wasting assets', due to this property where the time value gradually falls to zero.

It is also interesting to note that of the two component of option pricing (time value and intrinsic value), one component is inherently biased towards reducing in value, i.e., time value. So, if all things remain constant throughout the contract period, the option price will always fall in price by expiry. Thus, option sellers are at a fundamental advantage as compared to option buyers as there is an inherent tendency in the price to go down.

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.

The relationship between different factors and value of call/ put option is given in the table below. The arrow depicts the rise or fall in prices of options contracts when one of the parameter changes in value while other parameters remain unchanged.

Factor	Change in Factor	Call Premium	Put Premium
Spot Price	Increase	↑	↓
Spot Price	Decrease	↓	↑
Strike Price	Increase	↓	↑
Strike Price	Decrease	↑	↓

Factor	Change in Factor	Call Premium	Put Premium
Volatility	Increase	↑	↑
Volatility	Decrease	↓	↓
Time to Expiry	Longer	↑	↑
Time to Expiry	Shorter	↓	↓
Interest Rates	Increase	↑	↓
Interest Rates	Decrease	↓	↑

4.5.3 Option Greeks

Option premiums change with changes in the factors that determine option pricing i.e., factors such as strike price, volatility, term to maturity etc. "Greeks" is a term used in the options market to describe the different dimensions of risk involved in taking an options position. There are five primary Greek risk measures represented by Delta, Gamma, Theta, Vega and Rho.

Delta: The most important of the 'Greeks' is the option's "Delta". This measures the sensitivity of the option value to a given small change in the price of the underlying asset. It may also be seen as the speed with which an option moves with respect to price of the underlying asset.

Delta = Change in option premium/ Unit change in price of the underlying asset.

Delta of a long call option (and/ or short put) is always positive and ranges between 0 and 1 and for a long put (and/or short call) is always negative and ranges between 0 and -1.

Delta for call option
Assume a call option has a delta of 0.3 or 30 per cent – what does this mean?
Well, as we know the delta measures the rate of change of premium for every unit change in the underlying. So, a delta of 0.3 indicates that for every 1-point change in the underlying, the premium is likely change by 0.3 units, or for every 100-point change in the underlying the premium is likely to change by 30 points. The following example should help you understand this better:

Price of 6.10% GOI Securities 2031 @ 9:30 AM is at Rs. 98.80
Option Strike = 98.50 **Call Option**
Premium = Rs. 0.45
Delta of the option = + 0.55

Scenario 1: Price of 6.10% GOI Securities 2031 @ 3:00 PM is expected to reach Rs. 99.00
What is the likely option premium value at 3:00 PM?

We know the Delta of the option is 0.55, which means for every 1-point change in the underlying the premium is expected to change by 0.55 points. We are expecting the underlying to change by 0.20 paise (99.00 – 98.80), hence the premium is supposed to increase by
= 0.20*0.55
= 0.11
Therefore, the new option premium is expected to trade around **0.56** (= 0.45+0.11)
(Here, we assume that other factors like volatility etc. will remain constant).

Scenario 2: Price of 6.10% GOI Securities 2031 @ 3:00 PM is expected to reach Rs. 98.60
What is the likely option premium value at 3:00 PM?
We know the Delta of the option is 0.55, which means for every 1-point change in the underlying the premium is expected to change by 0.55 points. We are expecting the underlying to change by -0.20 paise (98.60 – 98.80), hence the premium is supposed to increase by
= -0.20*0.55
= -0.11
Therefore, the new option premium is expected to trade around **0.34** (= 0.45-0.11)

Gamma (γ)
It 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. It is calculated as the ratio of change in delta for a unit change in market price of the underlying asset.

Gamma = Change in an option delta / Unit change in price of underlying asset

Gamma works as an acceleration of the delta, i.e., it signifies the speed with which an option will go either in-the-money or out-of-the-money due to a change in price of the underlying asset.

For example, consider this – The delta and Gamma of an ATM Put option is -0.50 and 0.004 respectively. Remember Put options have a negative Delta. Gamma as you notice is a positive number i.e., +0.004. The underlying moves by 10 points without specifying the direction, so let us figure out what happens in both cases.

Case 1 – Underlying moves up by 10 points
Delta = – 0.5
Gamma = 0.004
Change in underlying = 10 points
Change in Delta = Gamma * Change in underlying = 0.004 * 10 = 0.04
New Delta = -0.5 + 0.04 = **– 0.46**
(The Put option loses delta when underlying increases)

Case 2 – Underlying goes down by 10 points
Delta = – 0.5
Gamma = 0.004
Change in underlying = – 10 points
Change in Delta = Gamma * Change in underlying = 0.004 * – 10 = – 0.04
New Delta = – 0.5 + (-0.04) = **– 0.54**
(The Put option gains delta when underlying goes down)

Theta (θ)
It 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.

Theta = Change in an option premium / Change in time to expiry

Other things being equal, options tend to lose time value each day throughout their life. This is due to the fact that the uncertainty element in the price decreases. Theta is expressed in points lost per day when all other conditions remain the same. Time runs in one direction; hence theta is always a positive number, however as it is a loss in options value, it is sometimes written as a negative number. A Theta of -0.5 indicates that the option premium will lose -0.5 points for every day that passes by. For example, if an option is trading at Rs.2.75 with theta of -0.05 then it will trade at Rs.2.70 the following day (provided other things are kept constant). A long option (option buyer) will always have a negative theta meaning all else equal, the option buyer will lose money on a day-by-day basis. A short option (option seller) will have a positive theta. Theta is a friendly Greek to the option seller.

Vega (v)
This 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.

Vega = Change in an option premium / Change in volatility

Vega is positive for a long call and a long put. An increase in the assumed volatility of the underlying increases the expected pay-out from a long option, whether it is a call or a put.

Since options gain value with increase in volatility, the vega is a positive number, for both calls and puts. For example – if the option has a vega of 0.15, then for each % change in volatility, the option will gain or lose 0.15 in its theoretical value. The effect of volatility is highest when there are more days left for expiry.

A 6.10% GOI 2031 security is trading at Rs. 99.50 in October and a November 100 call is trading for Rs.0.10. Let's assume that the vega of the option is 0.02 and that the underlying volatility is 10%. If the underlying volatility increased by 1% to 11%, then the price of the option should rise to 0.10 + (1 x 0.02) = 0.12.

However, if the volatility had gone down by 2% to 8%, then the option price should drop to 0.10 - (2 x 0.02) = Rs.0.06.

Rho (ρ)

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.

Rho = Change in an option premium / Change in cost of funding of the underlying

Call options generally rise in price as interest rates increase and put options generally decrease in price as interest rates increase. Thus, call options have positive rho, while put options have negative rho. Assume that put option is priced at Rs. 0.50 and has a rho of -0.05. If interest rates were to decrease from 5 per cent to 4 per cent, then the price of this put option would increase from Rs.0.50 to Rs.0.55. In this same scenario, assuming the call option mentioned above with price 0.25, its price would decrease from Rs 0.25 to Rs. 0.20.

4.5.4 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. It shows that value of European call with certain exercise price and exercise date can be deduced from the value of a European put with the same exercise price and exercise date and vice versa.

Put-call parity is stated using this equation-

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

Here-

- C stands for the price of the call option
- PV(x) is the present value of x (the strike price), as subtracted from the value it has on the date of expiration, as considered at a risk-free rate
- P is the price of the put
- S is the spot price (current market value) the underlying asset

4.6 Option pricing methodology

There are various option pricing models which traders use to arrive at the right value of the option. Some of the most popular models are briefly discussed below:

4.6.1 The Binomial Pricing Model

The binomial option pricing model was developed by William Sharpe in 1978. It has proved over time to be the most flexible, intuitive and popular approach to option pricing. 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. This is a very accurate model as it is iterative, but also very lengthy and time consuming.

4.6.2 The Black & Scholes Model

The Black & Scholes model was published in 1973 by Fisher Black and Myron Scholes. 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) using the five key determinants of an option's price: stock price, strike price, volatility, time to expiration, and short-term (risk free) interest rate.

Call and Put option price can be calculated as:

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

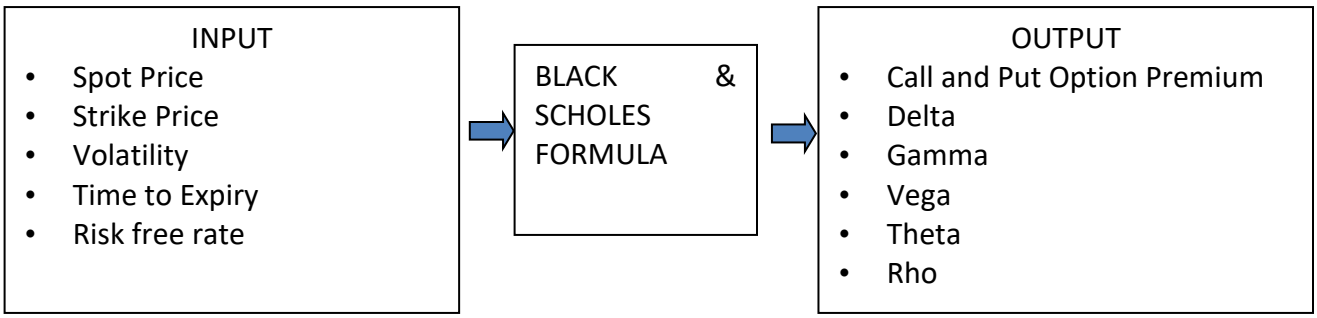
$P = Xe^{-rt}N(-d_2) - SN(-d_1)$

Where, $d1 = [\ln(S/X)+(r+v^2/2)*t]/(v*\sqrt{t})$

$d2 = d1 - v*\sqrt{t}$

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)
- In = natural logarithm
- N(x) = standard normal cumulative distribution function
- e = the exponential function



The Black-Scholes model was designed to value options that can be exercised only at maturity and whose underlying assets do not pay dividends. In addition, options are valued based on certain assumption like markets are random, zero transaction cost etc. In practice, assets do pay dividends, options sometimes get exercised early, and exercising an option can affect the value of the underlying asset. Trader may modify the formula to adjust for the effect of dividend etc.

Dividends: The payment of a dividend reduces the stock price; note that on the ex-dividend day, the stock price generally declines. Consequently, call options become less valuable and put options more valuable, as expected dividend payments increase. There are two ways of dealing with dividends in the Black & Scholes model:

1. Short-term options: One approach to dealing with dividends is to estimate the present value of expected dividends that will be paid by the underlying asset during the option life and subtract it from the current value of the asset to use as S in the model. Modified stock price = Current stock price – Present value of expected dividends during the life of the option.

2. Long-term options: Since it becomes less practical to estimate the present value of dividends for longer maturity options, an alternate approach can be used. If the dividend yield (y = Dividends/Current value of the asset) on the underlying asset is expected to remain unchanged during the life of the option, the Black-Scholes model can be modified to take dividends into account.

4.6.3 Black (1976) Model

The original Black–Scholes model has undergone several theoretical developments. One such development for the valuation of futures options is introduced by Black (1976). Black proposed a formula for options under the assumption that investors generate risk less hedges between options and the futures or forward contracts. The problem of negative cost of carry was addressed by using 'forward prices' in the option pricing model instead of 'spot prices'. Black observed that actual forward prices not only incorporate cost of carry but also takes into account other irregularities in the market. In his proposed model, he substituted spot price (S) by the discounted value of future price ($F*e^{-rt}$) in the original Black-Scholes model. Black's model found application in valuing options on physical commodities where future price is a better alternative input for valuing options. Its primary applications are for pricing options on future contracts, bond options, interest rate cap and floors, and swaptions.

The Call options prices as per Black's formula can be observed solving following equation:

$C = Fe^{-rt}*N(d_1) – Xe^{-rt}*N(d_2)$

$= e^{-rt} [F*N(d_1)-X*N(-d_2)]$

The corresponding Put price,

$P=e^{-rt} [X*N(-d_2)-F*N(-d_1)]$

Where $d1 = \frac{\ln (F/X) + (\sigma^2/2)t}{\sigma * \sqrt{t}}$

$d2 = \frac{\ln (F/X) - (\sigma^2/2)t}{\sigma * \sqrt{t}} = d1 - \sigma * \sqrt{t}$

And the variables are

- F = future price
- X = strike price
- t = time remaining until expiration, expressed in years
- r = current continuously compounded risk-free interest rate
- σ = volatility
- In = natural logarithm
- N(x) = standard normal cumulative distribution function
- e = the exponential function

The important difference between Black's and Black-Scholes is that Black uses forward/future prices and Black-Scholes uses spot prices. In India, for computation of theoretical price, of exchange traded interest rate option (underlying is government securities) Black 1976 options pricing model is used.

4.7 Implied Volatility (IV)

Different types of volatility are – Historical Volatility, Forecasted Volatility, and Implied Volatility.

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 – for instance historical volatility can 'somewhat' be used in the options calculator to get option price.

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. Implied volatility is reflected in the price of the premium. IV is a metric used by investors to estimate future fluctuations (volatility) of a security's price based on certain predictive factors. Implied volatility is denoted by the symbol σ (sigma). It can often be thought to be a proxy of market risk. It is commonly expressed using percentages and standard deviations over a specified time horizon. IV doesn't predict the direction in which the price change will proceed. For example, high volatility means a large

price swing, but the price could swing upward (very high), downward (very low), or fluctuate between the two directions. Low volatility means that the price likely won't make broad, unpredictable changes. When applied to the financial market, implied volatility generally increases in bearish markets, when investors believe equity prices will decline over time. IV decreases when the market is bullish. This is when investors believe prices will rise over time. Bearish markets are considered to be undesirable and riskier to the majority of equity investors.

Implied volatility can thus be derived from the cost of the option. In fact, if there were no options traded on a given underlying, there would be no way to calculate implied volatility. It is the only factor in the model that isn't directly observable in the market. Instead, the mathematical option pricing model uses other factors to determine implied volatility and the option's premium. Implied volatility is a dynamic figure that changes based on activity in the options marketplace. Usually, when implied volatility increases, the price of options will increase as well, assuming all other things remain constant. So, when implied volatility increases after a trade has been placed, it's good for the option owner and bad for the option seller. Conversely, if implied volatility decreases after you entering the trade, the price of options usually decreases. That's good if you are an option seller and bad if you are an option owner (i.e., for long option position).

4.8 Pay off Diagrams for Options

Having gone through the basic terminology used in the options market, let us get to the pay off profile of various option positions.

Long on Option

Buyer of an option is said to be "long on option". As described above, he/she would have a right and no obligation with regard to buying / selling the underlying asset in the contract. When you are long on option contract:

- You have the right to exercise that option.
- Your potential loss is limited to the premium amount you paid for buying the option.
- Profit would depend on the level of underlying asset price at the time of exercise/expiry of the contract.

Short on Option

Seller of an option is said to be "short on option". As described above, he/she would have obligation but no right with regard to selling/buying the underlying asset in the contract. When you are short (i.e., the writer of) an option contract:

- Your maximum profit is the premium received.
- You can be assigned to deliver if the option is exercised by the buyer. All option writers should be aware that assignment is a distinct possibility.
- Your potential loss is theoretically unlimited.

Please note that long/short on option and long/short position is different. Long on call option have long position on underlying on the other hand long on put option will have short position on underlying asset.
Now, let us understand each of these positions in detail:

4.8.1 Long Call

On October 1, 2021, 6.10% GOI 2031, security is trading at Rs. 98.40. You buy a call option with strike price of 98.50 at a premium of Rs. 0.20 with expiry date October 28, 2021. A Call option gives the buyer the right, but not the obligation to buy the underlying at the strike price. So, in this example, you have the right to buy 6.10% GOI 2031 security at Rs. 98.50. You may buy or you may not buy, there is no compulsion. If 6.10% GOI 2031 security price is above Rs. 98.50 at expiry, you will exercise the option, else you will let it expire. What will be your maximum profits/ losses under different conditions at expiry, we will try to find out using pay off charts.

If on expiry 6.10% GOI 2031 security price is Rs. 98.25, you will not exercise the right to buy the underlying (which you have got by buying the call option) as 6.10% GOI 2031 security is available in the market at a price lower than your strike price. Why will you buy something at Rs.98.50 when you can have the same thing at Rs. 98.25? So, you will forego the right. In such a situation, your loss will be equal to the premium paid, which in this case is Rs. 0.20.

If on expiry if 6.10% GOI 2031 security price were at Rs. 98.70, you will exercise the option and buy 6.10% GOI 2031 security at Rs.98.50 and make profit by selling it at Rs. 98.70. In this transaction you will make a profit of Rs. 0.20, but you have already paid this much money to the option seller right at the beginning, when you bought the option. So, Rs.98.70 is the Break-Even Point (BEP) for this option contract. A general formula for calculating BEP for call options is strike price plus premium (X + P).

If 6.10% GOI 2031 security were to close at Rs. 98.90, you will exercise the option and buy 6.10% GOI 2031 security at Rs.98.50 and sell it in the market at Rs.98.90, thereby making a profit of Rs. 0.40. But since you have already paid Rs. 0.20 as option premium, your net profit would be 0.40 – 0.20 =Rs.0.20. Similar to futures, options can be settled through physical delivery, or it can be cash settled. In case of cash settled option contract, on exercise option buyer will receive only the profit amount i.e. Rs.0.40.

For profits/losses for other values, a table is given below. This table is used to draw the pay off diagram:

Strike Price	Rs. 98.50		
Premium	Rs. 0.20		
GOI Security Price @ Expiry	Premium Paid	Profit on Exercise	Pay-off for Long Call Position
	(A)	(B)	(C) = (A) + (B)

98.00	-0.2000	0.0000	-0.2000
98.10	-0.2000	0.0000	-0.2000
98.20	-0.2000	0.0000	-0.2000
98.30	-0.2000	0.0000	-0.2000
98.40	-0.2000	0.0000	-0.2000
98.50	-0.2000	0.0000	-0.2000
98.60	-0.2000	0.1000	-0.1000
98.70	-0.2000	0.2000	0.0000
98.80	-0.2000	0.3000	0.1000
98.90	-0.2000	0.4000	0.2000
99.00	-0.2000	0.5000	0.3000
99.10	-0.2000	0.6000	0.4000
99.20	-0.2000	0.7000	0.5000
99.30	-0.2000	0.8000	0.6000
99.40	-0.2000	0.9000	0.7000
99.50	-0.2000	1.0000	0.8000
99.60	-0.2000	1.1000	0.9000
99.70	-0.2000	1.2000	1.0000
99.80	-0.2000	1.3000	1.1000
99.90	-0.2000	1.4000	1.2000
100.00	-0.2000	1.5000	1.3000



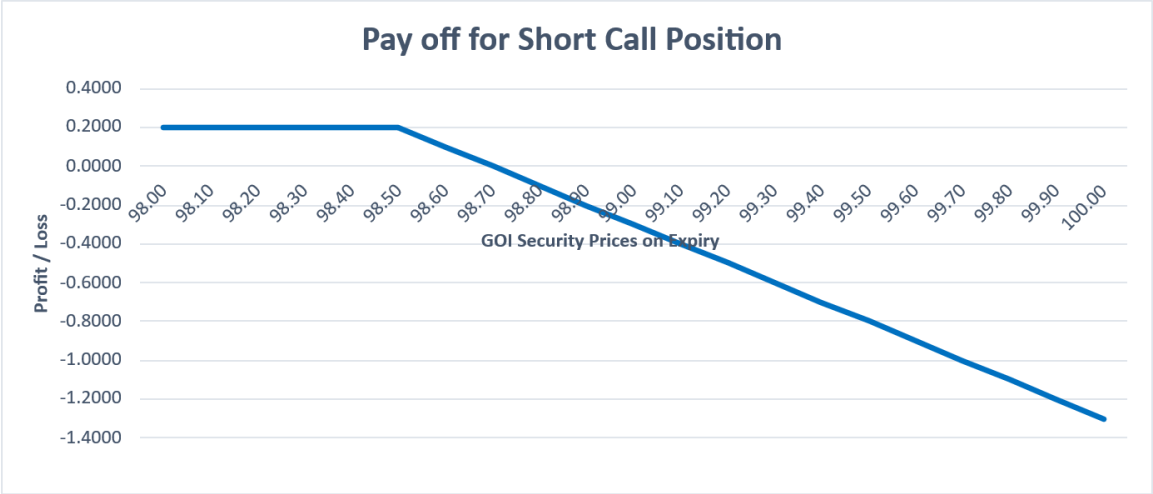
You can see from the diagram that maximum loss for such option buyer will be Rs. 0.20. The lot size of Exchange traded interest rate option is 2000 units, so the maximum loss per lot will be Rs. 400 (=2000*0.20).

4.8.2 Short Call

Whenever someone buys a call option, there has to be a counterparty, who has sold that call option. If the maximum loss for a long call position is equal to the premium paid, it automatically means that the maximum gain for the short call position will be equal to

the premium received. Similarly, if maximum gain for long call position is unlimited, then even maximum loss for the short call position has to be unlimited. Lastly, whenever, the long call position is making losses, the short call position will make profits and vice versa. Hence, if we have understood long call pay off, short call pay off chart will be just the water image of the long call pay off.

Strike Price	Rs. 98.50		
Premium	Rs. 0.20		
GOI Security Price @ Expiry	Premium Received	Loss on Exercise	Pay-off for Short Call Position
	(A)	(B)	(C) = (A) + (B)
98.00	0.2000	0.0000	0.2000
98.10	0.2000	0.0000	0.2000
98.20	0.2000	0.0000	0.2000
98.30	0.2000	0.0000	0.2000
98.40	0.2000	0.0000	0.2000
98.50	0.2000	0.0000	0.2000
98.60	0.2000	-0.1000	0.1000
98.70	0.2000	-0.2000	0.0000
98.80	0.2000	-0.3000	-0.1000
GOI Security Price @ Expiry	Premium Received	Loss on Exercise	Pay-off for Short Call Position
98.90	0.2000	-0.4000	-0.2000
99.00	0.2000	-0.5000	-0.3000
99.10	0.2000	-0.6000	-0.4000
99.20	0.2000	-0.7000	-0.5000
99.30	0.2000	-0.8000	-0.6000
99.40	0.2000	-0.9000	-0.7000
99.50	0.2000	-1.0000	-0.8000
99.60	0.2000	-1.1000	-0.9000
99.70	0.2000	-1.2000	-1.0000
99.80	0.2000	-1.3000	-1.1000
99.90	0.2000	-1.4000	-1.2000
100.00	0.2000	-1.5000	-1.3000



The pay-off chart for a short call position is shown above. Maximum gain for an option seller, as explained earlier, will be equal to the premium received, whereas maximum loss can be unlimited (when price starts moving above BEP). BEP for a short call position will also be equal to X + P. BEP is independent of position (long or short), it is instrument specific (call option).

4.8.3 Long Put

On October 1, 2021, 6.10% GOI 2031, security is trading at Rs. 98.40. You buy a put option with strike price of 98.50 at a premium of Rs. 0.30 with expiry date October 28, 2021. A Put option gives the buyer the right, but not the obligation to sell the underlying at the strike price. So, in this example, you have the right to sell 6.10% GOI 2031 security at Rs. 98.50. You may sell or you may not sell, there is no compulsion. If 6.10% GOI 2031 security price is below Rs. 98.50 at expiry, you will exercise the option; else you will let it expire. What will be your maximum profits/ losses under different conditions at expiry, we will try to find out using pay off diagrams.

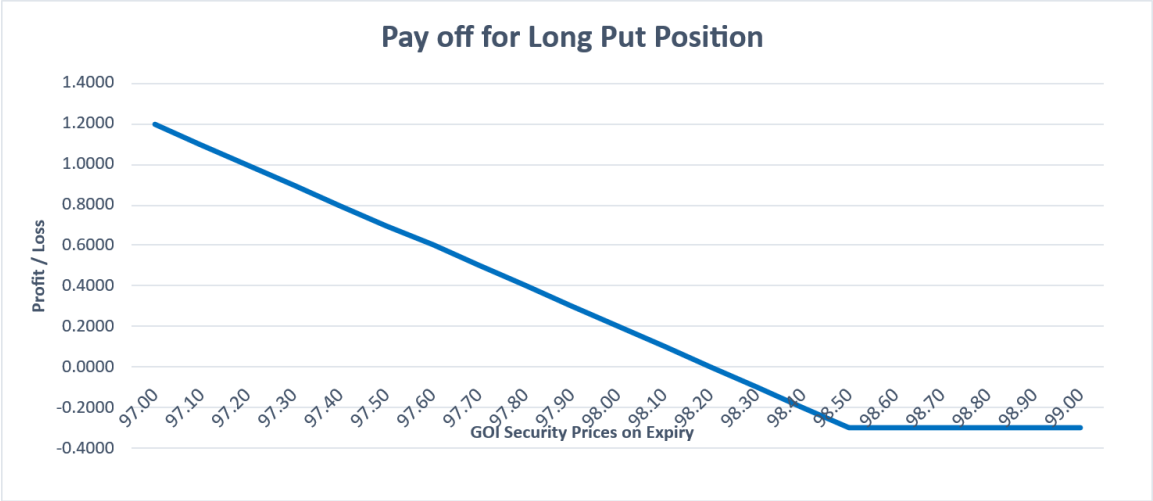
If on expiry 6.10% GOI 2031 security price is Rs. 98.75, you will not exercise the right to sell the underlying (which you have got by buying the put option) as 6.10% GOI 2031 security can be sold in the market at a price higher than your strike price. Why will you sell something at Rs.98.50 when you can sell the same thing at Rs. 98.75? So, you will forego the right. In such a situation, your loss will be equal to the premium paid, which in this case is Rs. 0.30.

If on expiry if 6.10% GOI 2031 security price were at Rs. 98.20, you will exercise the option and sell 6.10% GOI 2031 security at Rs.98.50 and make profit by buying it at Rs. 98.20. In this transaction you will make a profit of Rs. 0.30, but you have already paid this much money to the option seller right at the beginning, when you bought the option. So Rs.98.20 is the Break-Even Point (BEP) for this option contract. A general formula for calculating BEP for put options is strike price minus premium (X - P).

If 6.10% GOI 2031 security were to close at Rs. 98.00, you will exercise the option and sell 6.10% GOI 2031 security at Rs.98.50 and buy it in the market at Rs.98.00, thereby making a profit of Rs. 0.50. But since you have already paid Rs. 0.30 as option premium, your actual profit would be 0.50 – 0.30 = Rs.0.20. In case of cash settled option contract, on exercise option buyer will receive only the profit amount i.e., Rs.0.50.

For profits/losses for other values, a table is given below. This table is used to draw the pay off diagram:

Strike Price	Rs. 98.50		
Premium	Rs. 0.30		
GOI Security Price @ Expiry	Premium Paid	Profit on Exercise	Pay-off for Long Put Position
	(A)	(B)	(C) = (A) + (B)
97.00	-0.3000	1.5000	1.2000
97.10	-0.3000	1.4000	1.1000
97.20	-0.3000	1.3000	1.0000
97.30	-0.3000	1.2000	0.9000
97.40	-0.3000	1.1000	0.8000
97.50	-0.3000	1.0000	0.7000
97.60	-0.3000	0.9000	0.6000
97.70	-0.3000	0.8000	0.5000
97.80	-0.3000	0.7000	0.4000
97.90	-0.3000	0.6000	0.3000
98.00	-0.3000	0.5000	0.2000
98.10	-0.3000	0.4000	0.1000
GOI Security Price @ Expiry	Premium Paid	Profit on Exercise	Pay-off for Long Put Position
98.20	-0.3000	0.3000	0.0000
98.30	-0.3000	0.2000	-0.1000
98.40	-0.3000	0.1000	-0.2000
98.50	-0.3000	0.0000	-0.3000
98.60	-0.3000	0.0000	-0.3000
98.70	-0.3000	0.0000	-0.3000
98.80	-0.3000	0.0000	-0.3000
98.90	-0.3000	0.0000	-0.3000
99.00	-0.3000	0.0000	-0.3000



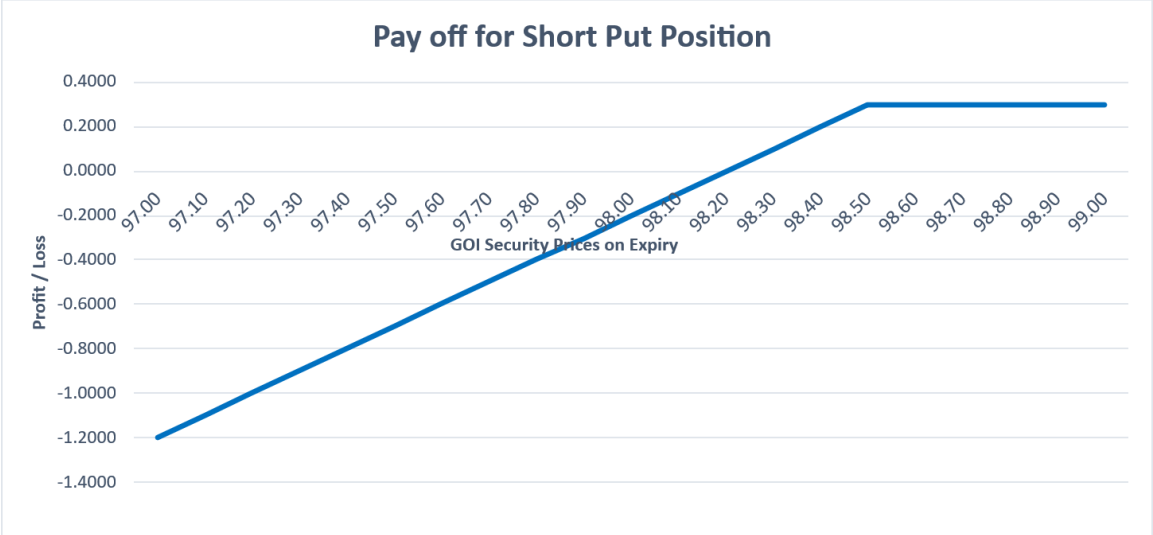
You can see from the diagram that maximum loss for such option buyer will be Rs. 0.30. The lot size of Exchange traded interest rate option is 2000 units, so the maximum loss per lot will be Rs. 600 (=2000*0.30)

4.8.4 Short Put

What will be the position of a put option seller/writer? Just the opposite of that of the put option buyer. When long put makes profit, short put will make loss. If maximum loss for long put is the premium paid, then maximum profit for the short put has to be equal to the premium received. If maximum profit for long put is when price of underlying falls to zero at expiry, then that also will be the time when short put position makes maximum loss. Whenever, the long-put position is making losses, the short put position will make profits and vice versa. Hence, if we have understood long put pay off, short put pay off chart will be just the water image of the long put pay off.

Strike Price	Rs. 98.50		
Premium	Rs. 0.30		
GOI Security Price @ Expiry	Premium Received	Loss on Exercise	Payoff for Short Put Position
	(A)	(B)	(C) = (A) + (B)
97.00	0.3000	-1.5000	-1.2000
97.10	0.3000	-1.4000	-1.1000
97.20	0.3000	-1.3000	-1.0000
97.30	0.3000	-1.2000	-0.9000
97.40	0.3000	-1.1000	-0.8000
97.50	0.3000	-1.0000	-0.7000
97.60	0.3000	-0.9000	-0.6000
97.70	0.3000	-0.8000	-0.5000
97.80	0.3000	-0.7000	-0.4000
97.90	0.3000	-0.6000	-0.3000

98.00	0.3000	-0.5000	-0.2000
98.10	0.3000	-0.4000	-0.1000
98.20	0.3000	-0.3000	0.0000
98.30	0.3000	-0.2000	0.1000
98.40	0.3000	-0.1000	0.2000
98.50	0.3000	0.0000	0.3000
98.60	0.3000	0.0000	0.3000
98.70	0.3000	0.0000	0.3000
98.80	0.3000	0.0000	0.3000
98.90	0.3000	0.0000	0.3000
99.00	0.3000	0.0000	0.3000



The pay-off chart for a short put position is shown above. Maximum gain for an option seller, as explained earlier, will be equal to the premium received, whereas maximum loss will be up to underlying price become zero (when price starts moving below BEP). BEP for a short put position will also be equal to X - P. BEP is independent of position (long or short), it is instrument specific (put option).

As can be seen above, options are products with asymmetric risk exposure i.e., the gains when the underlying asset moves in one direction is significantly different from the losses when the underlying asset moves in the opposite direction. For example, under a call option, when a stock price goes down, the loss incurred by the buyer of this option is limited to the purchase price of the option. But if the stock price goes up, the buyer of the call gains in proportion to the rise in the stock's value, thereby giving asymmetric pay off. In contrast to this, futures have symmetric risk exposures (symmetric pay off).

4.8.5 Square-off option positions

Similar to futures, options positions can also be square-off (closing of position) before expiry of contracts. For e.g. On October 01, 2021, a dealer hedges 100 Crs G-Secs holding by buying 5000 lots of October 2021 expiry 6.10% GOI 2031 put option at a strike of Rs 101.00 when available price was Rs 0.20/0.21. He sold his underlying G-Secs on October 15, 2021. The dealer decided to cancel the option on 15th October when available price for the same contract was Rs 0.10/0.11. The net pay-off for dealer will be:
Premium paid: Rs. 1050/- (5000*0.21)
Premium received at the time of square off: Rs. 500 (5000*0.10)
Net gain / (loss) : (Rs. 550)

4.9 Contract Specification of Exchange Traded Interest Rate Options

RBI vide its notification FMRD.DIRD.12/14.01.011/2016-17 dated December 29, 2016, has decided to introduce Interest Rate Options in India. It has also allowed Exchanges to introduced Interest Rate Options subject to regulatory approval. RBI has advised Fixed Income Money Market and Derivatives Association of India (FIMMDA), in consultation with market participants, to publish a list of objective and transparent rupee money or debt market rates or instruments that may be used as underlying for Interest Rate Option contracts in the OTC market and stock exchanges.

Subsequently, RBI has issued Rupee Interest Rate Derivatives (Reserve Bank) Directions, 2019 on June 26, 2019, which has superseded the above direction. We will see in detail the regulatory framework of Interest Rate Derivatives in subsequent chapter. Based on these guidelines and after approval from SEBI, first the Exchanges traded interest rate options were introduced in August 2019 on single Government of India securities. Exchange traded interest rate options are standardized contract in terms of market lot, expiry date, underlying asset, strike price etc. Currently, Exchanges provide interest rate options on many Governments of India securities. Contract Specification of Exchange Traded Interest Rate Options are given below:

Underlying	GOI Dated Securities. For e.g. Option on 6.33% Central Government Security having maturity in 2035. GOI bond is selected by Exchanges in consultation with FIMMDA.
Unit of Trading	1 Lot - (1 lot = notional bonds of FV INR 2 Lakhs i.e. 2000 bonds)
Quotation	The premium for options contract shall be quoted in Indian Rupees.
Contract Value	Trade Price * 2000
Tick Size	Rs. 0.0025

Price Band	The price bands for options shall be based on the delta of the options contract and calculated using the previous close price of the underlying and volatility. The price band so computed shall be subject to a minimum operating range which would be applicable for all contracts. The bands shall be computed for each options contract on a daily basis and shall be applicable from the next trading day. The operating range may be flexed during the day in case the option traded prices crosses certain percentage of the set range.
Trading Hours	Monday to Friday: 9:00 a.m. to 5:00 p.m. (Align the trading hours of IRO with that of underlying market in case of change of trading hours of underlying NDS-OM platform)
Option Type	Premium style European Call & Put Options
Strike Price Interval	Rs. 0.25 (For e.g. strike will be available at RS. 99.50, 99.75, 100.00, 100.25, 100.50, etc.)
No. of strikes	Minimum eight in-the-money, eight out-of-the-money and one near-the-money strikes shall be provided for all available contracts.
Trading Cycle/Contract Cycle	Three serial monthly contracts followed by three quarter ended contracts (Mar, Jun, Sep & Dec)
Expiry Day	Last Thursday of the month. In case the last Thursday is a trading holiday, the previous trading day shall be the expiry / last trading day.
Mode of Settlement	Cash Settlement
Settlement Agency	Settlement through clearing corporation of Exchanges. Settlement guarantee is provided by clearing corporation of Exchanges.
Final Settlement Price	Weighted average price of the underlying bond based on the prices during the last two hours of the trading on NDS-OM. If less than 5 trades are executed in the underlying bond during the last two hours of trading, then FIMMDA/FBIL price shall be used for final settlement
Daily Settlement Price	Volume Weighted Average Price of contract based on last half an hour across exchanges or theoretical price
Final Settlement	T+1

4.10 Comparison of Exchange Traded IRO and OTC IRO

The difference between Exchange Traded Interest Rate Options contract with OTC Option contract is almost similar to futures and forward contracts. Exchange traded IRO have

some distinct advantages over OTC IRO as they eliminate counterparty risk and offer more liquidity and price transparency. However, it should be noted that OTC products enjoy the benefit of being customized to meet specific client requirements. Table below mentions a few differences between Exchange Traded IRO and OTC IRO:[15]

Parameters	**Exchange Traded IRO**	**OTC IRO**
Operational mechanism	Contract between two parties through centralized trading platform of Exchanges	Mainly bilateral over-the-counter (OTC) transactions. Can be traded on electronic trading platform.
Terms of contracts	Standardized Contract	Non-Standardized. Each Contract is custom designed and hence unique in terms of contract size, expiration date, asset quality, asset type, etc.
Available Product	Mainly European Interest Rate Options	European Interest Rate Options (IRO) including caps, floors, collars and reverse collars. Also, swaptions and structured derivative products
Price Discovery	Price discovery through free interaction of buyers and sellers on centralized trading platform	Mainly through negotiation. Not efficient
Liquidation Profile	High, as contracts are standardised exchange-traded contracts.	Low, as contracts are tailor made catering to the needs of the parties involved. Further, contracts are not easily accessible to other market participants
Market Maker	Currently not applicable	Scheduled Banks, PDs, AIFIs are eligible to act as market maker
Settlement	Clearing & Settlement through clearing corporation with guaranteed settlement	Mainly bilateral settlement by parties.
Quality of information and dissemination	Traded nationwide. Information is available online on trading platform and websites.	Reporting of trade to the trade repository within 30 minutes
Advantages	• Price transparency • Elimination of Counterparty credit risk as settlement	• Since customized product can provide perfect hedge. • Availability of multiple product

[15] RBI direction of 2019 considered for comparison

Parameters	Exchange Traded IRO	OTC IRO
	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	• May lead to imperfect hedge as settlement is standardised • All products may not be available on Exchanges as per the need of participants	• Liquidity risk • Counter party risk • Not accessible for all kind of market participants

4.11 Market Indicators

4.11.1 Open Interest:

Total Number of options or futures contracts that are NOT closed in a particular trading cycle Key indicator of market participation and liquidity.

Date	Trading Activity	Open Interest	Volume
1-June	A Buys 1 option and B Sells 1 Option Contract	1	1
2-June	C buys 5 options and D sells 5 options	6	6
3-June	A sells his 1 option and D buys 1 option contract	5	7
4-June	E buys 5 options from C who sells 5 option contracts	5	12

General Open Interest Interpretation

Underlying	Open Interest	General Interpretation
Rising	Rising	Long build up, Bullish Signal
Rising	Falling	End of Bullish trend
Falling	Rising	Short Build up, Bearish Signal

Underlying	Open Interest	General Interpretation
Falling	Falling	End of Bearish Trend

4.11.2 Put Call Ratio (PCR)

An Indicator to measure sentiment of the market. High PCR indicates bearishness and Low PCR indicates bullishness. It is calculated either
Put Open Interest/Call Open interest
OR
Put Trading Volume/Call Trading Volume

A PCR above 1 indicates that the put volume has exceeded the call volume. It indicates an increase in the bearish sentiment. A PCR below 1 indicates that the call volume exceeds the put volume. It signifies a bullish market ahead. Nonetheless, it must be noted that a PCR of 1 is not a reliable point to measure market sentiment. It is because more traders tend to buy call options than put options. Resultantly, an average PCR of 0.7 for equity options is deemed to be suitable for assessing the market sentiment. That being said, a PCR over 0.7 or 1 signifies that more traders are purchasing put options when compared to call options. With the build-up of bearish sentiment, more investors either hedge their portfolios in case of sell-offs or speculate a falling market. Conversely, a falling put-call ratio below 0.7 and approximately 0.5 signifies bullish tendencies.

A. PCR as a Contrarian Indicator:
    a. PCR is often used as a contrarian indicator, meaning it signals potential reversals when it reaches extreme levels.
    b. Very high PCR may signal an oversold market, potentially leading to a price rebound. Traders might consider buying calls.
    c. Very low PCR may signal an overbought market, potentially leading to a price decline. Traders might consider buying puts.
B. Limitation of PCR
    a. Even though it is a contrarian indicator, investors must weigh in other prominent factors before betting on the prevailing market sentiments.
    b. To arrive at effective outcomes, one must use PCR in addition to other potent indicators.
    c. Investors must know how to read the put-call ratio chart correctly; as even a small shift serves as an essential indicator of the plausible market movement.

Sample Questions

1. The price which option buyer pays to option seller to acquire the right is called as _____.
    a. Agreed Price
    b. Strike Price
    c. Sell Price
    d. **Premium**

2. Option buyer faces _____ risk and option seller faces _____ risk.
    a. **Limited, Unlimited**
    b. Limited, Limited
    c. Unlimited, Limited
    d. Unlimited, Unlimited

3. An option is _____, if on exercising it, the option buyer gets negative cash flow.
    a. In the money
    b. At the money
    c. **Out of the money**
    d. None of the above

4. The difference between option premium and intrinsic value is _____.
    a. Strike Price
    b. **Time Value**
    c. Expiry Value
    d. Option Value

5. Participants buy a put option with strike price of 98.50 at a premium of Rs. 0.20. On Expiry the bond price is Rs. 98.50. What is his net pay-off?
    a. Profit of Rs. 0.20
    b. Profit of Rs. 0.25
    c. No profit & no loss
    d. **Loss of Rs. 0.20**

CHAPTER 5: STRATEGIES USING EXCHANGE TRADED INTEREST RATE DERIVATIVES

LEARNING OBJECTIVES:

After studying this chapter, you should know about following:

- Role of Hedgers, Speculators and Arbitragers
- Hedging, Speculative and Arbitrage Transaction using ETIRD
- Option Trading Strategies with their Pay-off
- Spread Trading using ETIRD
- Limitation of Interest Rate Derivatives for Hedgers

5.1 Market participants

The uses of Exchange Traded Interest Rate Derivatives (ETIRD) market could be better understood by first understanding different type of market participants and their objectives. There could be three different types of market participants. The description of these participants and their objective is given below:

Hedgers

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. 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. Since interest rates and bond prices are inversely related, the risk associated with a rise in interest rates causes bond prices to fall, and vice versa.

Bond investors, specifically those who invest in long-term fixed-rate bonds, are more directly susceptible to interest rate risk. For example, an entity (bond holder) invested Rs. 10 Crores in 6.10% 10-year GOI securities. This bond will pay them Rs. 61,00,000 per year till maturity. If there is an increase in interest rate to 6.50%, the new bond will pay Rs. 65,00,000 till maturity. If the 6.10% bondholder continues to hold his bond through maturity, he loses out on the opportunity to earn a higher interest rate. Alternatively, he could sell his 6.10% bond in the market and buy the bond with the higher interest rate. However, doing so results in the investor getting a lower price on his sale of 6.10% bonds as bond prices are inversely related to interest rate, the price of the 6.10% bond will decrease with increase in interest rate. The bondholder wants to hedge the interest rate risk. In this example, the bond holder is a hedger.

Speculators

This 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. Speculators play a vital role in the ETIRD markets. Derivatives are designed primarily to assist hedgers in managing their exposure to price risk; however, this would not be possible without the participation of speculators. Speculators, or traders, assume the price risk that hedgers attempt to lay off in the markets. In other words, hedgers often depend on speculators to take the other side of their trades (i.e., act as counter party) and to add depth and liquidity to the markets that are vital for the functioning of an interest rate derivatives market.

Let's understand the same with an example:

For instance, assume, a farmer expects the price of wheat to fall in near future. He wants to hedge his price risk on wheat produce for next 3 months till the time he has actual produce in his hands and so would like to lock at the forward/ futures price now. Accordingly, farmer can sell futures contracts on the expected quantity of produce. In order to sell this futures contract, he needs a buyer. This buyer may be someone who needs wheat after three months, may be a flour mill or a bakery. However, most of the times, there is a demand supply mismatch in the market and the trader fills the gap between demand and supply. Here trader, counterparty to the farmer, is thinking in contrary i.e., this buyer will buy only if he thinks that actual price of wheat is going to be higher than the contract price for futures three months down the line. Further, the profit of trader would depend upon actual wheat price being more than the contracted futures price at the maturity of futures contract. If it is so, trader would make money otherwise he would lose money.

Arbitragers

In addition to hedgers and traders, to establish a link between various markets like spot and derivatives, we need a third type of participants called arbitragers. These 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. They have neither exposure to risk and nor do they take the risk. Arbitragers lock in a profit by simultaneously entering opposite side transactions in two or more markets. For example, if the relation between forward prices and futures prices differs, it gives rise to arbitrage opportunities. Difference in the equilibrium prices determined by the demand and supply at two different markets also gives opportunities to arbitrage. As more and more market players will realize this opportunity, they may also implement the arbitrage strategy and in the process will enable market to come to a level of equilibrium and the arbitrage opportunity may cease to exist.

For example, at the end of day (1st January 2020):
Market price of underlying asset (in Rs.) 100
March futures 110
Lot size 50
Here an arbitrageur will buy in the cash market at Rs. 100 and sell in the Futures market at Rs. 110, thereby locking Rs. 10 as his profit on each unit. On the expiration date, suppose price (in Rs.) of the underlying asset is 108.

Cash Market	Futures
Buy 100	Sell 110
Sell 108	Buy 108
+8	+2

Total profit would therefore be (8+2=10) 10*50 = Rs. 500.

Suppose price (in Rs.) of the underlying asset is 95 on the expiration date.

Cash Market	Futures
Buy 100	Sell 110
Sell 95	Buy 95
-5	+15

Total profit is (-5+15=10) 10*50 = Rs. 500.

In the entire activity, the transaction cost, impact cost, carry cost/opportunity cost/borrowing cost, etc. have not been considered. In real life, all these costs have to be considered.

Here, it may be interesting to look at the risks these arbitragers carry. As seen before, arbitragers are executing positions in two or more markets/products simultaneously. Even if the systems are seamless and electronic and both the legs of transaction are liquid, there is a possibility of some gap between the executions of both the orders. If either leg of the transaction is illiquid then the risk on the arbitrage deal is huge as only one leg may get executed and another may not, which would open the arbitrager to the naked exposure of a position. Similarly, if contracts are not cash settled in both or one of the markets, it would need reversal of trades in the respective markets, which would result in additional risk on unwinding position with regard to simultaneous execution of the trades. These profit focused traders and Arbitragers fetch enormous liquidity to the products traded on the exchanges. This liquidity in turn results in better price discovery, lesser cost of transaction and lesser manipulation in the market.

5.2 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.

Instrument (i.e., T Bill or GOI Bond futures/options) will depend on the tenor of interest rate we want to trade. T-Bills price is determined by short-term rate of three months (because the underlying has a maturity of 91 days) and GOI Bond price is mainly determined by long term rate (assuming underlying is a 10Y bond).

Market side (i.e., buy or sell futures contract) will depend on our expectation about the direction of rate change in future/option and underlying instrument. If we expect the rate to go up in future, then the GOI bond price will fall in future, implying that we should sell futures contract/buy put option with underlying as GOI bond now and subsequently buy it when its price falls. Similarly, if we expect the rate to go down in future, then the GOI bond prices will rise in future, implying that we should buy futures contract/buy call option with underlying as GOI bond now and subsequently sell it later when its price rises. However, if underlying instrument is overnight MIBOR future, then for expectation of short-term rate will increase we should go long on overnight MIBOR future and for expectation of short-term rate will decrease we should go short on overnight MIBOR futures. In case of hedging, market side will depend on what kind of risk participant have and what kind of derivatives product participant using for hedging the interest rate risk. For e.g. if participant wants to borrow money after 3 months, they will have risk of interest rate increasing. In such case they will take long position on interest rate. Now for hedging this risk through single bond interest rate futures, participant will sell futures (due inverse relation between interest rate and price of bonds), however if participant wants to hedge the risk through MIBOR futures, participant will go long on MIBOR futures.

Contract Month will depend on the timing of expected rate change. If we expect the rate change to occur in one month, we should choose a contract that expires in one month; if we expect the rate change to occur in three months, we should choose a contract that expires in three months; and so on. The following summarizes the selection of these parameters.

<table>
<tr><th>Parameter</th><th>Selection</th></tr>
<tr><td>Instrument</td><td>Linked to tenor of rate being traded
For 3M rate, use T Bill futures.
For 10Y rate, use 10Y GOI Bond futures/Option</td></tr>
<tr><td>Market side</td><td>Linked to expected change in the direction of rate.

<table>
<tr><th>Interest Rate Expectation</th><th>Market Side</th><th>Position</th></tr>
<tr><td>Interest Rate will increase.</td><td>Long on Interest Rate</td><td>Sell GOI bond futures
Buy GOI bond put option
Sell T-Bills Futures
Buy Overnight MIBOR future</td></tr>
</table>
</td></tr>
</table>

Parameter	Selection		
	Interest Rate will decrease	Short on Interest Rate	Buy GOI bond futures Buy GOI bond call option Buy T-Bills futures Sell overnight MIBOR futures
Contract Month	Linked to when we expect the change in rate to occur The timing of expected change in rate should be the same as contract month of futures/option		

Hedging with futures: Hedging with futures can be implemented by undertaking a futures position as a temporary substitute for transactions to be made in the spot market at a later date. If a cash and futures prices move together any loss realized by the hedger from one position (either cash or futures) will be offset by a profit on the other position.

5.2.1 Short Hedge

A short hedge is used to protect against a decline in the cash price of a fixed income security. To execute a short hedge futures contracts are sold. By establishing a short hedge, a hedger has fixed future cash price and transferred the price risk of ownership to the buyer of the futures contract.

Example:
Date: September 20, 2021.
Investor 'X' holds 6.10% G-Secs 2031 worth Rs. 5 Crores at Rs. 100.00 (yield of bond 6.10%). There is a monetary policy review scheduled in October 2021 and investor expecting increase in yield of G-Sec securities post monetary policy, which will lead to reduction in G-Sec prices. Also, the investor is expecting new bond issuance in October 2021 with a higher coupon rate. Investor wants to sell the old bond and want to invest in new bond with higher coupon. What choices the investor has?

I. Sell bond now and invest in short maturity paper (T-Bills @3.20%)
II. Hold bond till October 28, 2021
III. Hold bond and hedge with interest rate futures.

As investor holding a bond, he is long on debt securities and short on interest rate. Investor is exposed to risk of increasing interest rate. So, Investor should go long on interest rate by taking short position in bond futures. To hedge the position, investor has sold 6.10% G-Secs 2031 October 2021 expiry (October 28, 2021) futures at Rs. 99.95. Since one contract is of notional value of Rs. 200000, investor will sale 250 lots (= Rs 5 Crores / Rs 2 lacs).

On expiry, October 28, 2021, the price of a bond is Rs. 98.36 (yield 6.32%). Let us examine the pay-off on expiry on all three scenarios.

Scenario I : Sell bond now and invest in T-Bills		
Trade Date	September 20, 2021	
Settlement Date	September 21, 2021	G-Secs are settled on T+1
Clean Price	Rs. 100	
Accrued Interest	Rs.1.169167	For 69 Days (Basis-30/360)
Total Consideration	Rs. 50584583.33	
Amount invested in T-Bills	Rs. 50584583.33	
No. of Days for investment	38	
Return on T-Bills	Rs. 168522.89	38 days return on T-Bills @3.20%
Amount available on Expiry	**Rs. 50753106.22**	

Scenario II : Hold Bond till October 28, 2021		
Trade Date	October 28, 2021	
Settlement Date	October 29, 2021	G-Secs are settled on T+1
Clean Price	Rs. 98.36	
Accrued Interest	Rs.1.81306	107 Days (Basis-30/360)
Amount available on Expiry	**Rs. 50086527.78**	
Scenario III: Hold bond and hedge with interest rate futures		
Underlying Transaction		
Trade Date	October 28, 2021	
Settlement Date	October 29, 2021	G-Secs are settled on T+1
Clean Price	Rs. 98.36	
Accrued Interest	Rs.1.81306	For 107 Days (Basis-30/360)
Total Consideration (A)	50086527.77	
Interest Rate Future Transaction		
Trade Date	September 20, 2021	
Short Futures @	Rs.99.95	250 lots
On Expiry	October 28, 2021	
Expiry Price	Rs.98.36	
Profit on Futures (B)	Rs. 795000	(99.95-98.36)*250*2000
Amount available on Expiry (A) +(B)	**Rs. 50881527.78**	

Similarly, a fund manager knows that bonds must be liquidated in 45 days to make a payment to beneficiaries. If interest rates rise during the 45 days, more bonds need to be

liquidated at a lower price than todays to realize the payment to beneficiary. To protect against this possibility, fund manager can sell bonds futures in the futures market to lock selling price.

Scenario Comparison

	Scenario 1	**Scenario 2**	**Scenario 3**
Total amount available on expiry	Rs. 50753106.22	Rs. 50086527.78	Rs. 50881527.78
Advantage	Avoid interest rate risk by investing in short term paper	Accrued interest on holding security Beneficial if price of bond increase	Accrued interest on holding security No exposure to interest rate risk
Limitation	Loosing on accrued interest	Expose to interest rate risk	Impact cost in IRF Matching of Expiry price with trade price on expiry (As cash settled transaction) Opportunity loss in case of increase in GOI price

One need to considered cost of transaction, liquidity, etc., while executing such strategy.

5.2.2 Portfolio Based Hedging:

In the above example, we have seen the hedging of same bond through interest rate futures. However, in reality the investors/bond holder will hold multiple bonds of different maturity and interest rate futures may not be available on all these bonds. How will investor hedge its position with single bond futures?

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). The maximum extent of short position that may be taken in IRFs to hedge interest rate risk of the portfolio, or part of the portfolio, is as per the formula given below:

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

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

Example: An investor has a Rs. 26 Crores portfolio of GOI bonds with portfolio duration of 6.1. The bond futures have duration of 4.7. The one-month GOI bond futures price is Rs. 98.50. What is the number of futures contracts to fully hedge the portfolio?

Number of lots = $\frac{(26,00,00,000 * 6.1)}{(98.50 * 4.7 * 2000)}$ (as 1 lot = 2000 units)

Therefore, Number of lots = 1713 lots (approx.)

The limitation of employing a duration-based hedging strategy has much to do with the fact that duration measures are only accurate for small changes in yield. For large changes in yield, the price/yield relationship is not linear but is actually convex. Thus, using the strategy in the face of large moves in yield will result in "underhedging". Further, the price of portfolio & futures contract may not move in tandem leads to basis risk.

5.2.3 Hedging Future Borrowing

In case a participant wants to borrow money in future and expecting that the interest rate will rise in future, he/she can use bond futures for hedging against such scenario.

For example, a corporate wants to issue NCDs for 10 years after 1 month. Generally, they are able to borrow at 50 basis point spread over the G-Secs. In such case the Institution sells IRF contracts to hedge against the rise in interest rates.

Trade Date	14th August 20XX	24th September 20XX
IRF	7.59% GOI 20XX	7.59% GOI 20XX
Expiry Date	24th September 20XX	24th September 20XX
Position	Sell	Settlement @ FSP
Futures Price / FSP	Rs. 95.60	Rs. 94.80
Yield @ Futures Price	7.93%	8.08%

The Institution gains Rs 0.80 (=95.60-94.80) per bond in IRF. Hence, borrowing cost for institution will reduce to the extent of its gain in IRF. The Institution has effectively locked its borrowing cost at lower rate. Please note that, this will not provide perfect hedge to market participants as the underlying instruments are different and hence there will be a basis risk.

5.2.4 Long Hedge

Long hedges are usually initiated by traders who intend purchasing an asset in the future and are concerned that prices may rise in the interim period. In case of interest rate derivatives, investors want to invest in fixed income securities in future and are concerned that the interest rate will go down in futures (i.e., prices may rise in futures) and wants to hedge against the same. In a long hedge, the hedger buys a futures contract to lock in purchase price / yield. An insurance company's Fund Manager may use a long hedge when

substantial cash contributions are expected and the manager is concerned that the interest rate will fall. Also, a bond trader who knows that bonds are maturing in near future and expects that interest rate will fall can employ a long hedge to lock in a rate.

Example:
An Insurance company 'X' is expecting to receive policy premiums worth Rs. 200 Crores in the month of March 2020. However, fund manager is concerned about the fall in interest rate. On February 12, 20XX, the underlying 6.45% G-Secs 2029 was trading at Rs. 99.79 (yield of bond 6.48%) the March 20XX expiry series of 6.45% G-Secs 2029 future was trading at Rs. 99.60 (future yield 6.51%). Fund manager has taken long position for RS. 200 Crores (10000 lots) in 6.45% G-Secs 2029 March' XX expiry futures contract.

On March 26, 20XX (expiry date) the 6.45% G-Secs 2029 was trading at Rs. 101.58 (yield of 6.23%). If the contract is physically settled, the fund manager will receive the bond at Rs. 99.60 with yield of 6.51%. In case of cash settlement, the profit from future for fund manager Rs. 3.96 Crores { = (101.58-99.60)*10000 lots*2000 units} which can be invested in bond to earn higher interest/yield.

Hedging is a risk management strategy employed to offset losses in investments by taking an opposite position in a related asset. The reduction in risk provided by hedging also typically results in a reduction in potential profits. So, in case of long hedge example (section 5.2.4), if on March 26, 20XX (expiry date) the 6.45% G-Secs 2029 was trading at Rs. 99.00 (6.59%). The insurance company will have loss from the futures position which will be a loss of Rs. 1.20 Crores { = (99.60-99.00)*10000 lots*2000 units} which will reduce the overall return for the insurance company.
Since an option contract provides the contract buyer the right, but not the obligation, to buy or sell an asset or financial instrument at a fixed price on or before a predetermined future month, the participant can also use option to hedge their position. The maximum risk to the buyer of an option is limited to the premium paid. So, in case of long hedge example (section 5.2.4) the company may buy GOI bond call option and hedge the position. Similarly, for short hedge (section 5.2.1) and hedging future borrowing (section 5.2.3) the company hedge by buying GOI bond put option. We will discuss about various option strategies in detail in next section.

5.3 Option Trading Strategies

Having understood the risk / return profiles for vanilla call / put options in earlier chapter, now we turn to using these products to our advantage – called option strategies. The only limiting factor for strategies is the thought of the trader / strategy designer. As long as the trader can think of innovative combinations of various options, newer strategies will keep coming to the market. Exotic products (or 'exotics') are nothing but a combination of different derivative products. In this section, we will see some of the most commonly used strategies.

5.3.1 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
  - Using Puts
- Bearish Vertical Spread
  - Using Calls
  - Using Puts

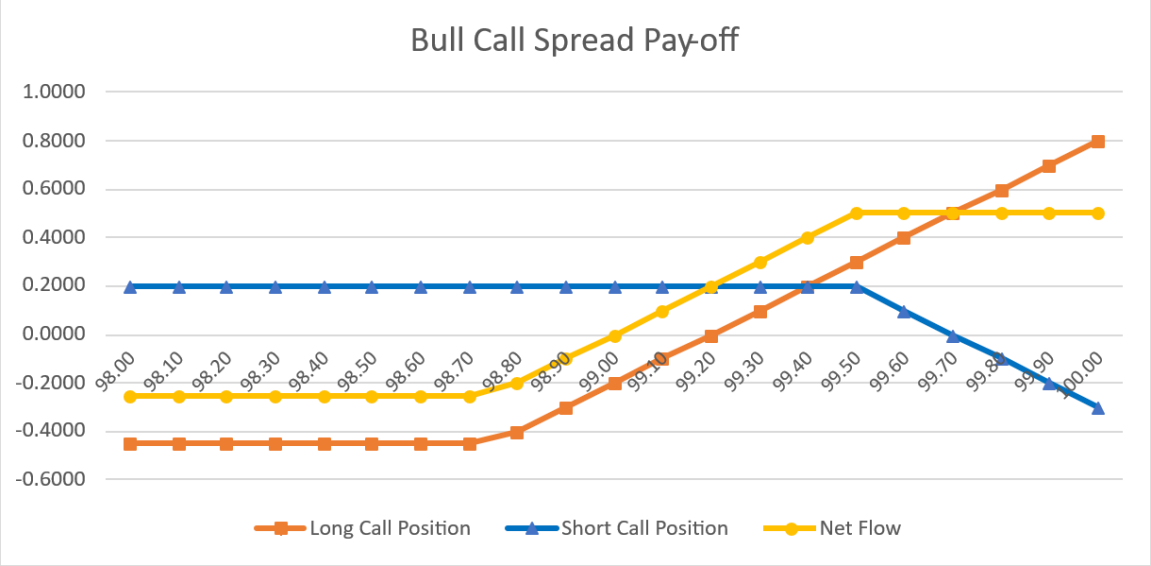
5.3.1.1 Bullish Vertical Spread using Calls

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. So, he takes one long call position with lower strike and sells a call option with higher strike. As lower strike call will cost more than the premium earned by selling a higher strike call, although the cost of position reduces, the position is still a net cash outflow position to begin with. Secondly, as higher strike call is shorted, all gains on long call beyond the strike price of short call would get negated by losses of the short call. To take more profits from his long call, trader can short as high strike call as possible, but this will result in his cost coming down only marginally, as higher strike call will fetch lesser and lesser premium.

Say, for example, a trader is bullish on bond (assumes interest rate will go down), so he decides to go long on 98.75 strike call option by paying a premium of 0.45 and he expects market to not go above 99.50, so he shorts a 99.50 call option and receives a premium of 0.20. His pay off for various price moves will be as follows:

Option Type	**Call**	**Call**
Long/Short	Long	Short
Strike Price	98.75	99.50
Premium	0.45	0.20
Spot	99.000	

GOI Security Price @ Expiry	Long Call Position	Short Call Position	Net Flow
98.00	-0.4500	0.2000	-0.2500
98.10	-0.4500	0.2000	-0.2500
98.20	-0.4500	0.2000	-0.2500
98.30	-0.4500	0.2000	-0.2500
98.40	-0.4500	0.2000	-0.2500
98.50	-0.4500	0.2000	-0.2500
98.60	-0.4500	0.2000	-0.2500
98.70	-0.4500	0.2000	-0.2500
98.80	-0.4000	0.2000	-0.2000
98.90	-0.3000	0.2000	-0.1000
99.00	-0.2000	0.2000	0.0000
99.10	-0.1000	0.2000	0.1000
99.20	0.0000	0.2000	0.2000
99.30	0.1000	0.2000	0.3000
99.40	0.2000	0.2000	0.4000
99.50	0.3000	0.2000	0.5000
99.60	0.4000	0.1000	0.5000
99.70	0.5000	0.0000	0.5000
99.80	0.6000	-0.1000	0.5000
99.90	0.7000	-0.2000	0.5000
100.00	0.8000	-0.3000	0.5000



As can be seen from the above pay off chart, it is a limited profit and limited loss position. Maximum profit in this position is Rs.0.50 (99.50-98.75-0.25), which will be when both options will get exercised i.e., on and above Rs. 99.50 and maximum loss is Rs.0.25 (0.45-

0.20) when both option unexercised i.e., on or below Rs. 98.75 and BEP for this is Rs. 99.00 (98.75+0.45-0.20).

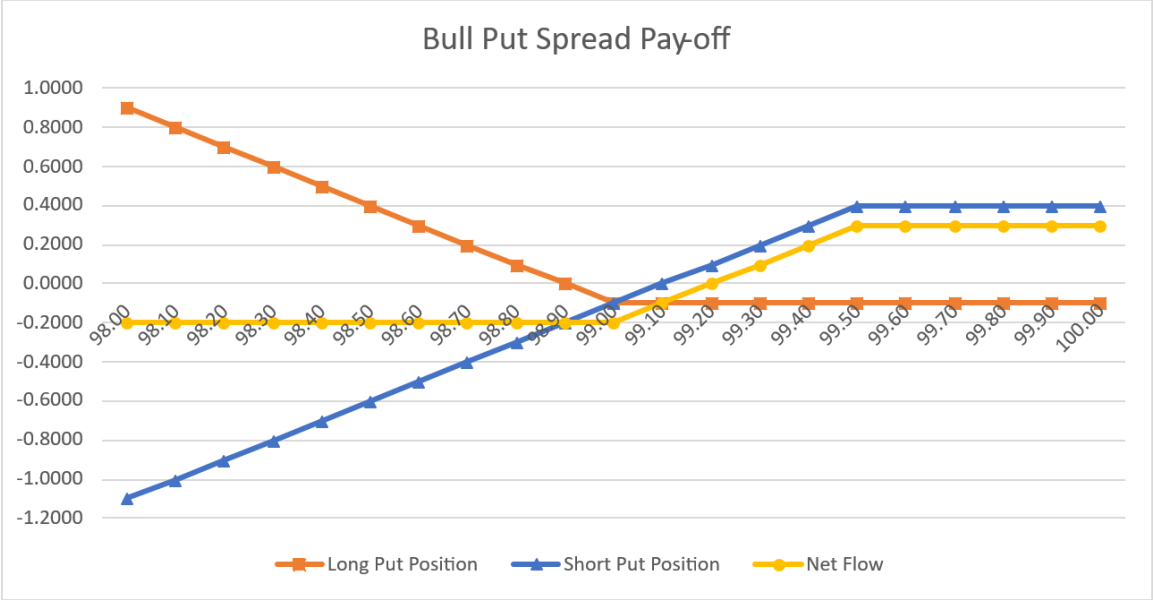
5.3.1.2 Bullish Vertical Spread using Puts

Here again, the call on the market is bullish, hence, the trader would like to short a put option. If prices go up, trader will end up with the premium on sold puts. However, in case prices go down, the trader would be facing risk of unlimited losses. In order to protect to his downside, he may buy a put option with a lower strike. While this would reduce his overall upfront premium, benefit would be the embedded insurance against unlimited potential loss on short put. This is a net premium receipt strategy.

Let us see this with the help of an example, where the trader goes short in a put option of strike 99.50 and receives a premium of 0.40 and goes long in a put option of strike 99.00 and pays a premium of 0.10:

Option Type	**Put**	**Put**
Long / Short	**Long**	**Short**
Strike Price	99	99.50
Premium	0.10	0.40
Spot	99.60	

GOI Security Price @ Expiry	**Long Put Position**	**Short Put Position**	**Net Flow**
98.00	0.9000	-1.1000	-0.2000
98.10	0.8000	-1.0000	-0.2000
98.20	0.7000	-0.9000	-0.2000
98.30	0.6000	-0.8000	-0.2000
98.40	0.5000	-0.7000	-0.2000
98.50	0.4000	-0.6000	-0.2000
98.60	0.3000	-0.5000	-0.2000
98.70	0.2000	-0.4000	-0.2000
98.80	0.1000	-0.3000	-0.2000
98.90	0.0000	-0.2000	-0.2000
99.00	-0.1000	-0.1000	-0.2000
99.10	-0.1000	0.0000	-0.1000
99.20	-0.1000	0.1000	0.0000
99.30	-0.1000	0.2000	0.1000
99.40	-0.1000	0.3000	0.2000
99.50	-0.1000	0.4000	0.3000
99.60	-0.1000	0.4000	0.3000
99.70	-0.1000	0.4000	0.3000
99.80	-0.1000	0.4000	0.3000
99.90	-0.1000	0.4000	0.3000
100.00	-0.1000	0.4000	0.3000



As can be seen from the above pay off chart, it is a limited profit and limited loss position. Maximum profit in this position is 0.30 (0.40-0.10) and maximum loss is 0.20 (99.50-99.00-0.30) BEP for this spread is 99.20 (99.50-0.30). Maximum profit in this position will be when both the options expire unexercised and the maximum loss will be when both the options get exercised.

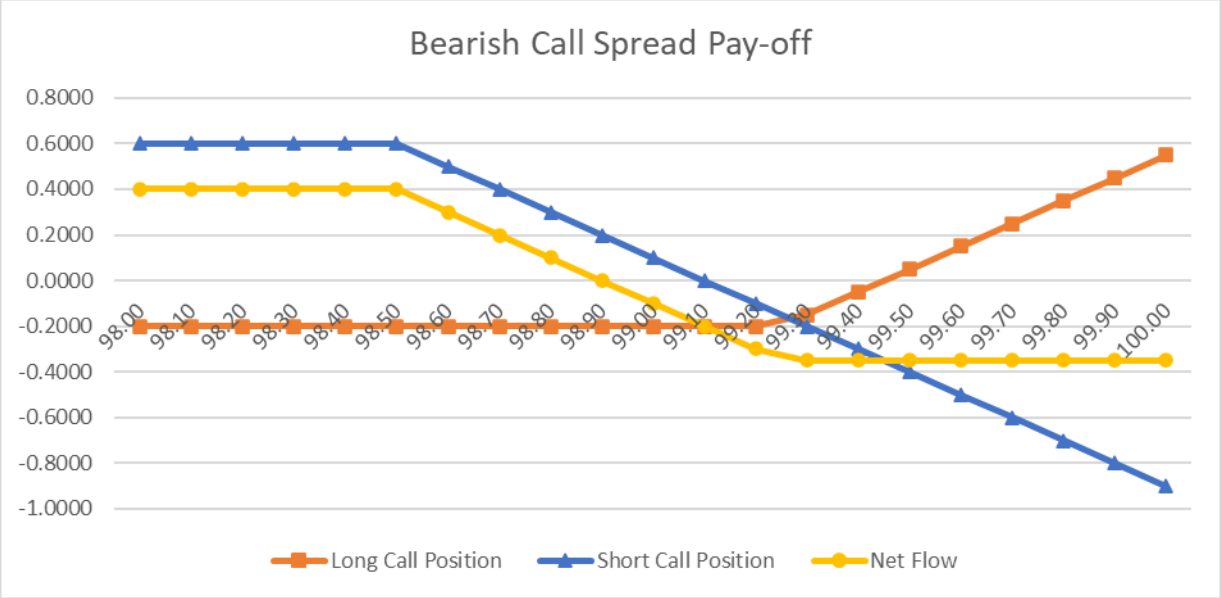
5.3.1.3 Bearish Vertical Spread using Calls

Here, the trader is bearish on the bond prices (i.e., assumes interest rate will go up) and so he shorts a low strike high premium call option. The risk in a naked short call is that if prices rise, losses could be unlimited. So, to prevent his unlimited losses, he longs a high strike call and pays a lesser premium. Thus, in this strategy, he starts with a net inflow.

Option Type	**Call**	**Call**
Long/Short	**Long**	**Short**
Strike Price	99.25	98.5
Premium	0.20	0.60
Spot	99.000	

GOI Security Price @ Expiry	**Long Call Position**	**Short Call Position**	**Net Flow**
98.00	-0.2000	0.6000	0.4000
98.10	-0.2000	0.6000	0.4000
98.20	-0.2000	0.6000	0.4000
98.30	-0.2000	0.6000	0.4000
98.40	-0.2000	0.6000	0.4000
98.50	-0.2000	0.6000	0.4000

GOI Security Price @ Expiry	Long Call Position	Short Call Position	Net Flow
98.60	-0.2000	0.5000	0.3000
98.70	-0.2000	0.4000	0.2000
98.80	-0.2000	0.3000	0.1000
98.90	-0.2000	0.2000	0.0000
99.00	-0.2000	0.1000	-0.1000
99.10	-0.2000	0.0000	-0.2000
99.20	-0.2000	-0.1000	-0.3000
99.30	-0.1500	-0.2000	-0.3500
99.40	-0.0500	-0.3000	-0.3500
99.50	0.0500	-0.4000	-0.3500
99.60	0.1500	-0.5000	-0.3500
99.70	0.2500	-0.6000	-0.3500
99.80	0.3500	-0.7000	-0.3500
99.90	0.4500	-0.8000	-0.3500
100.00	0.5500	-0.9000	-0.3500



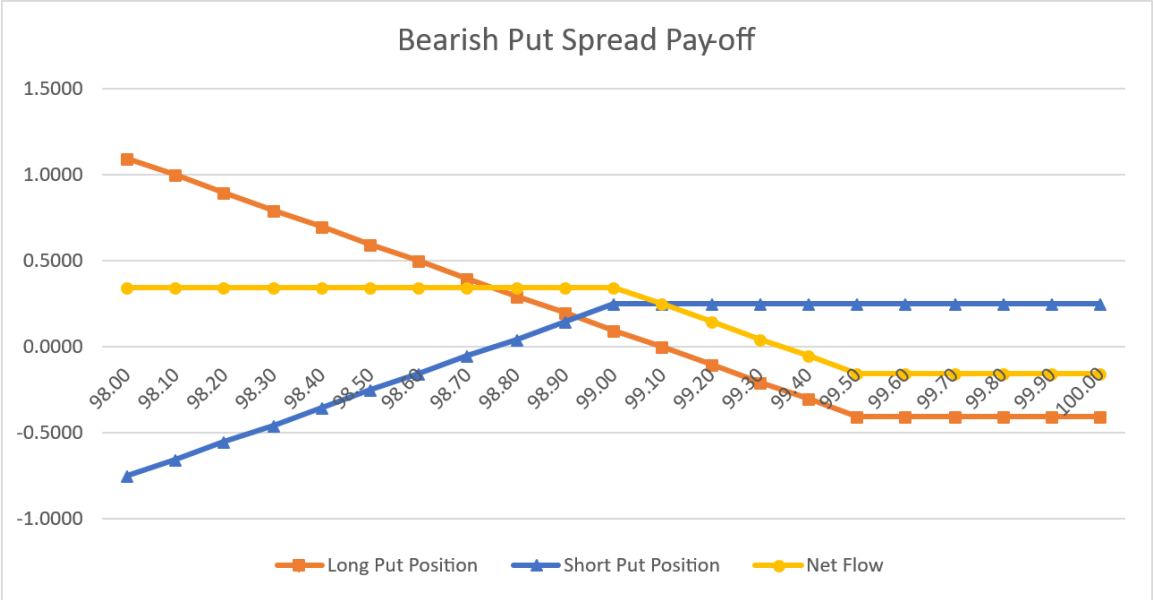
As can be seen from the above pay-off chart, it is a limited profit and limited loss position. Maximum profit in this position is Rs. 0.40 and maximum loss is Rs.0.35. BEP for this position is 98.90. Maximum profit in this position when bond prices will go down and both options will get unexercised and maximum loss when bond prices will go up and both options get exercised.

5.3.1.4 Bearish Vertical Spread using Puts

Here, again the trader is bearish on the market and so goes long in one put option by paying a premium. Further, to reduce his cost, he shorts another low strike put and receives a premium.

Option Type	**Put**	**Put**
Long / Short	**Buy**	**Sell**
Strike Price	99.5	99
Premium	0.40	0.25
Spot	99.400	

GOI Security Price @ Expiry	**Long Put Position**	**Short Put Position**	**Net Flow**
98.00	1.1000	-0.7500	0.3500
98.10	1.0000	-0.6500	0.3500
98.20	0.9000	-0.5500	0.3500
98.30	0.8000	-0.4500	0.3500
98.40	0.7000	-0.3500	0.3500
98.50	0.6000	-0.2500	0.3500
98.60	0.5000	-0.1500	0.3500
98.70	0.4000	-0.0500	0.3500
98.80	0.3000	0.0500	0.3500
98.90	0.2000	0.1500	0.3500
99.00	0.1000	0.2500	0.3500
99.10	0.0000	0.2500	0.2500
99.20	-0.1000	0.2500	0.1500
99.30	-0.2000	0.2500	0.0500
99.40	-0.3000	0.2500	-0.0500
99.50	-0.4000	0.2500	-0.1500
99.60	-0.4000	0.2500	-0.1500
99.70	-0.4000	0.2500	-0.1500
99.80	-0.4000	0.2500	-0.1500
99.90	-0.4000	0.2500	-0.1500
100.00	-0.4000	0.2500	-0.1500



As can be seen from the above pay-off chart, it is a limited profit and limited loss position. Maximum profit in this position is Rs. 0.35 and maximum loss is Rs.0.15. BEP for this position is 99.35. Maximum profit in this position when bond prices will go down and both options will get exercised and maximum loss when bond prices will go up and both options get unexercised.

5.3.2 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. Underlying reasoning behind horizontal spreads is that these two options would have different time values and the trader believes that difference between the time values of these two options would shrink or widen. This is essentially a play on premium difference between two options prices squeezing or widening.

5.3.3 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.

5.3.4 Straddle

This strategy involves two options of same strike prices and same maturity. A long straddle position is created by buying a call and a put option of same strike and same expiry whereas a short straddle is created by shorting a call and a put option of same strike and same expiry.

5.3.4.1 Long Straddle

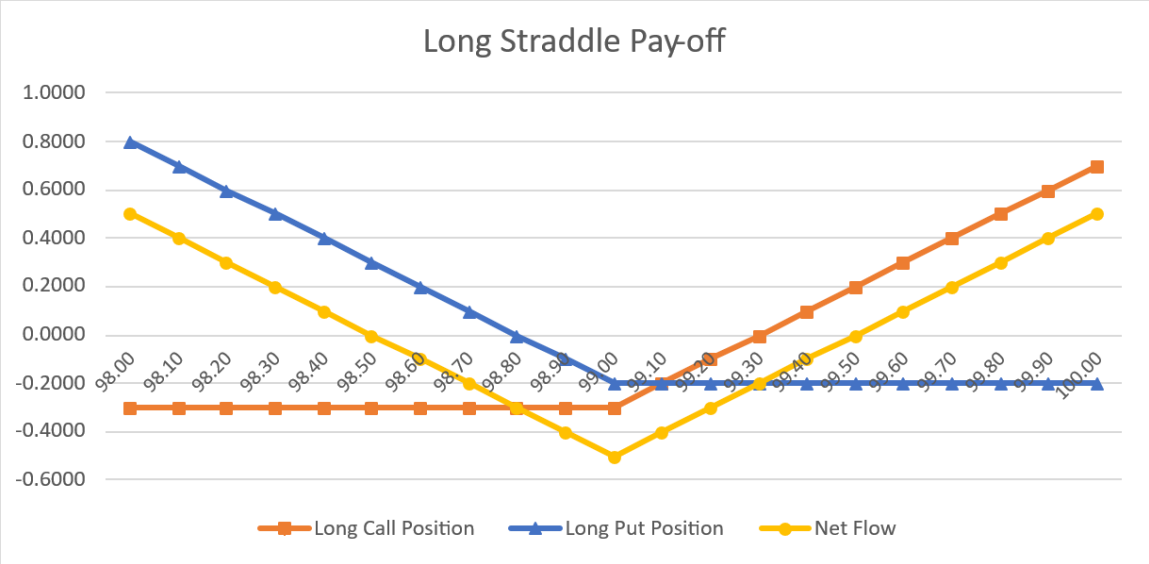
If a person buys both a call and a put at same strike price, then his maximum loss will be equal to the sum of these two premiums paid and, price movement from here (in either direction) would first result in that person recovering his premium and then making profit. This position is undertaken when trader's view on bond price of the underlying is uncertain (due to uncertainty about interest rate / bond yield movement), but he thinks that in whatever direction the market moves, it would move significantly in that direction.

As the bond price keeps moving up, loss on long put position is limited to premium paid, whereas profit on long call position keeps increasing. Thus, it can be seen that for huge swings in either direction, the strategy yields profits. However, there would be a band within which the position would result into losses. This position would have two Break even points (BEPs) and they would lie at "Strike – Total Premium" and "Strike + Total Premium". Combined pay-off may be shown as follows:

Option Type	**Call**	**Put**
Long/Short	**Long**	**Long**
Strike Price	99	99
Premium	0.3	0.2
Spot	99.000	

GOI Security Price @ Expiry	**Long Call Position**	**Long Put Position**	**Net Flow**
98.00	-0.3000	0.8000	0.5000
98.10	-0.3000	0.7000	0.4000
98.20	-0.3000	0.6000	0.3000
98.30	-0.3000	0.5000	0.2000
98.40	-0.3000	0.4000	0.1000
98.50	-0.3000	0.3000	0.0000
98.60	-0.3000	0.2000	-0.1000
98.70	-0.3000	0.1000	-0.2000
98.80	-0.3000	0.0000	-0.3000
98.90	-0.3000	-0.1000	-0.4000
99.00	-0.3000	-0.2000	-0.5000
99.10	-0.2000	-0.2000	-0.4000
99.20	-0.1000	-0.2000	-0.3000
99.30	0.0000	-0.2000	-0.2000
99.40	0.1000	-0.2000	-0.1000
99.50	0.2000	-0.2000	0.0000
99.60	0.3000	-0.2000	0.1000
99.70	0.4000	-0.2000	0.2000
99.80	0.5000	-0.2000	0.3000

GOI Security Price @ Expiry	Long Call Position	Long Put Position	Net Flow
99.90	0.6000	-0.2000	0.4000
100.00	0.7000	-0.2000	0.5000



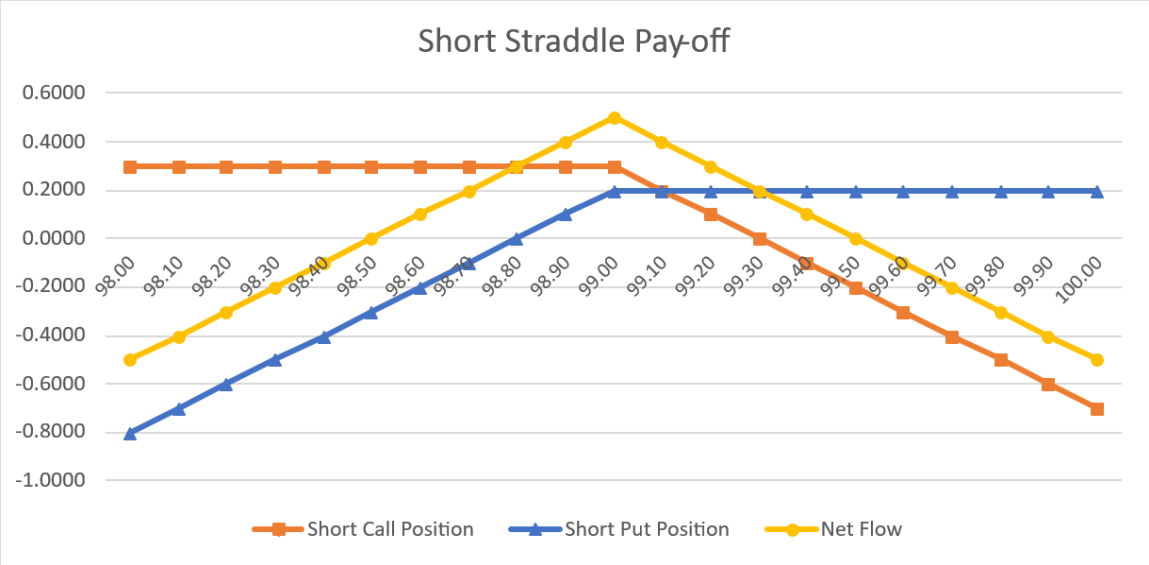
As can be seen from the above pay-off chart, it is limited loss and unlimited profit strategy. It may be noted from the table and picture, that maximum loss of Rs. 0.50 would occur to the trader if underlying expires at strike of option Rs.99.00. Further, as long as underlying expires between Rs.98.50 and Rs.99.50, he would always incur the loss and that would depend on the level of underlying. His profit would start only after recovery of his total premium of Rs.0.50, in either direction, and that is the reason there are two breakeven points in this strategy.

5.3.4.2 Short Straddle

This would be the exact opposite of long 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. As position of short straddle is just opposite of long straddle, the payoff chart would be just inverted, so what was loss for long straddle would become profit for short straddle. Position may be shown as follows:

Option Type	Call	Put
Long/Short	Short	Short
Strike Price	99	99
Premium	0.3	0.2
Spot	99.000	

GOI Security Price @ Expiry	Short Call Position	Short Put Position	Net Flow
98.00	0.3000	-0.8000	-0.5000
98.10	0.3000	-0.7000	-0.4000
98.20	0.3000	-0.6000	-0.3000
98.30	0.3000	-0.5000	-0.2000
98.40	0.3000	-0.4000	-0.1000
98.50	0.3000	-0.3000	0.0000
98.60	0.3000	-0.2000	0.1000
98.70	0.3000	-0.1000	0.2000
98.80	0.3000	0.0000	0.3000
98.90	0.3000	0.1000	0.4000
99.00	0.3000	0.2000	0.5000
99.10	0.2000	0.2000	0.4000
99.20	0.1000	0.2000	0.3000
99.30	0.0000	0.2000	0.2000
99.40	-0.1000	0.2000	0.1000
99.50	-0.2000	0.2000	0.0000
99.60	-0.3000	0.2000	-0.1000
99.70	-0.4000	0.2000	-0.2000
99.80	-0.5000	0.2000	-0.3000
99.90	-0.6000	0.2000	-0.4000
100.00	-0.7000	0.2000	-0.5000



It should be clear that this strategy is limited profit and unlimited loss strategy and should be undertaken with significant care. Further, it will incur the loss for trader if market moves significantly in either direction – up or down.

5.3.5 Strangle

This strategy is similar to straddle in outlook but different in implementation, aggression and cost.

5.3.5.1 Long Strangle

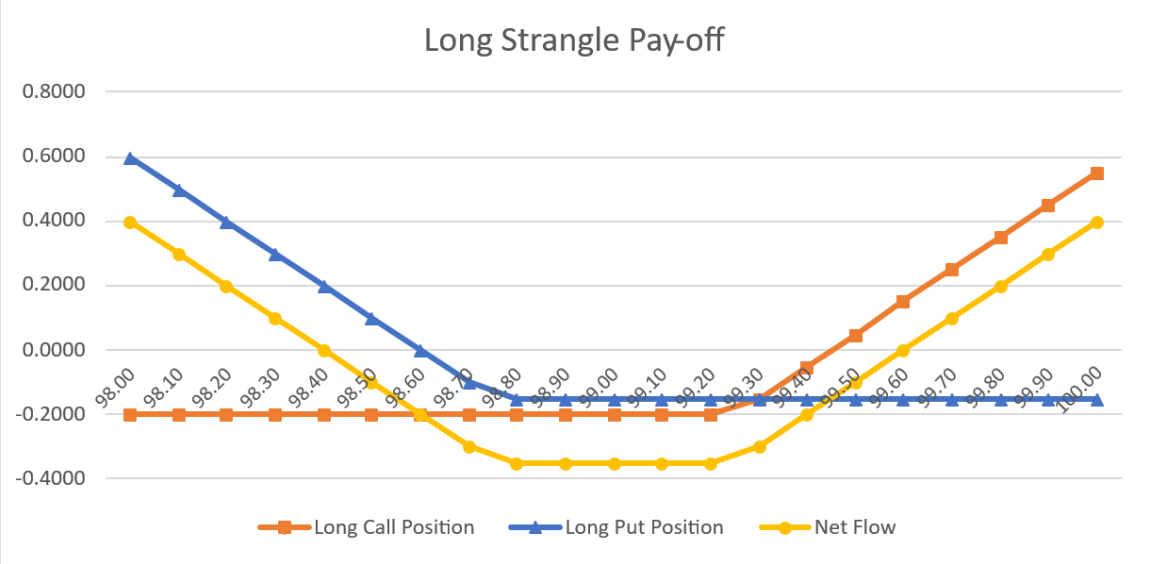
As in case of long strangle, the outlook here (for the long strangle position) is that the market will move substantially in either direction, but while in straddle, both options have same strike price, in case of a strangle, the strikes are different. Also, both the options (call and put) in this case are out-of-the-money and hence premium paid is low.

Let us say the underlying bond price Rs.99. Rs. 99.25 strike call is available at 0.20 and Rs.98.75 put is trading at a premium of 0.15. Both these options are out-of-the-money. If a trader goes long on both these options, then his maximum cost would be equal to the sum of the premiums of both these options. This would also be his maximum loss in worst case situation. However, if market starts moving in either direction, his loss would remain same for some time and then reduce. And, beyond a point in either direction, he would make money.

Option Type	**Call**	**Put**
Long/Short	**Long**	**Long**
Strike Price	99.25	98.75
Premium	0.2	0.15
Spot	99.000	

GOI Security Price @ Expiry	**Long Call Position**	**Long Put Position**	**Net Flow**
98.00	-0.2000	0.6000	0.4000
98.10	-0.2000	0.5000	0.3000
98.20	-0.2000	0.4000	0.2000
98.30	-0.2000	0.3000	0.1000
98.40	-0.2000	0.2000	0.0000
98.50	-0.2000	0.1000	-0.1000
98.60	-0.2000	0.0000	-0.2000
98.70	-0.2000	-0.1000	-0.3000
98.80	-0.2000	-0.1500	-0.3500
98.90	-0.2000	-0.1500	-0.3500
99.00	-0.2000	-0.1500	-0.3500
99.10	-0.2000	-0.1500	-0.3500
99.20	-0.2000	-0.1500	-0.3500
99.30	-0.1500	-0.1500	-0.3000
99.40	-0.0500	-0.1500	-0.2000
99.50	0.0500	-0.1500	-0.1000
99.60	0.1500	-0.1500	0.0000

GOI Security Price @ Expiry	Long Call Position	Long Put Position	Net Flow
99.70	0.2500	-0.1500	0.1000
99.80	0.3500	-0.1500	0.2000
99.90	0.4500	-0.1500	0.3000
100.00	0.5500	-0.1500	0.4000



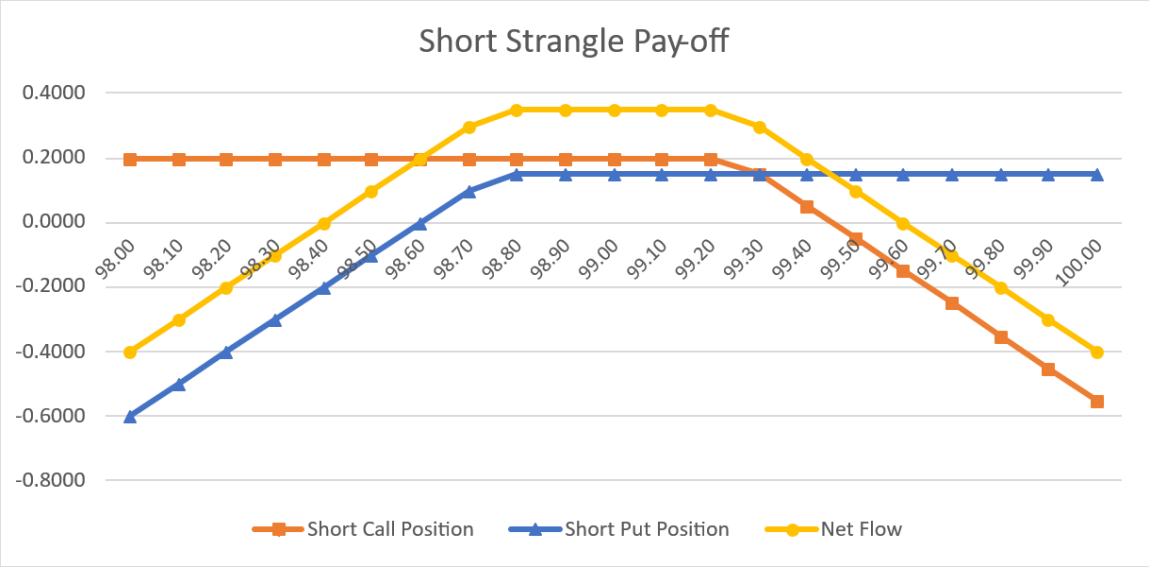
In this position, maximum profit for the trader would be unlimited in both the directions – up or down and maximum loss would be limited to Rs. 0.35, which would occur if underlying expires at any price between 98.75 and 99.25. Position would have two BEPs at 98.40 and 99.60. Until underlying crosses either of these prices, trader would always incur loss.

5.3.5.2 Short Strangle

This is exactly opposite to the long strangle with two out-of-the-money options (call and put) shorted. Outlook, like short straddle, is that market will remain stable over the life of options. Pay offs for this position will be exactly opposite to that of a long strangle position. As always, the short position will make money, when the long position is in loss and vice versa.

Option Type	Call	Put
Long/Short	Short	Short
Strike Price	99.25	98.75
Premium	0.2	0.15
Spot	99.000	

GOI Security Price @ Expiry	Short Call Position	Short Put Position	Net Flow
98.00	0.2000	-0.6000	-0.4000
98.10	0.2000	-0.5000	-0.3000
98.20	0.2000	-0.4000	-0.2000
98.30	0.2000	-0.3000	-0.1000
98.40	0.2000	-0.2000	0.0000
98.50	0.2000	-0.1000	0.1000
98.60	0.2000	0.0000	0.2000
98.70	0.2000	0.1000	0.3000
98.80	0.2000	0.1500	0.3500
98.90	0.2000	0.1500	0.3500
99.00	0.2000	0.1500	0.3500
99.10	0.2000	0.1500	0.3500
99.20	0.2000	0.1500	0.3500
99.30	0.1500	0.1500	0.3000
99.40	0.0500	0.1500	0.2000
99.50	-0.0500	0.1500	0.1000
99.60	-0.1500	0.1500	0.0000
99.70	-0.2500	0.1500	-0.1000
99.80	-0.3500	0.1500	-0.2000
99.90	-0.4500	0.1500	-0.3000
100.00	-0.5500	0.1500	-0.4000



In this position, maximum loss for the trader would be unlimited in both the directions – up or down and maximum profit would be limited to Rs. 0.35, which would occur if underlying expires at any price between 98.75 and 99.25. Position would have two BEPs

at 98.40 and 99.60. Until underlying crosses either of these prices, trader would always make profit.

5.3.6 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. If an investor has bought bond and intends to hold them for some time, then he would like to earn some additional income on that bond (other than coupon), without selling it, thereby reducing his cost of acquisition/increasing the return on bond.

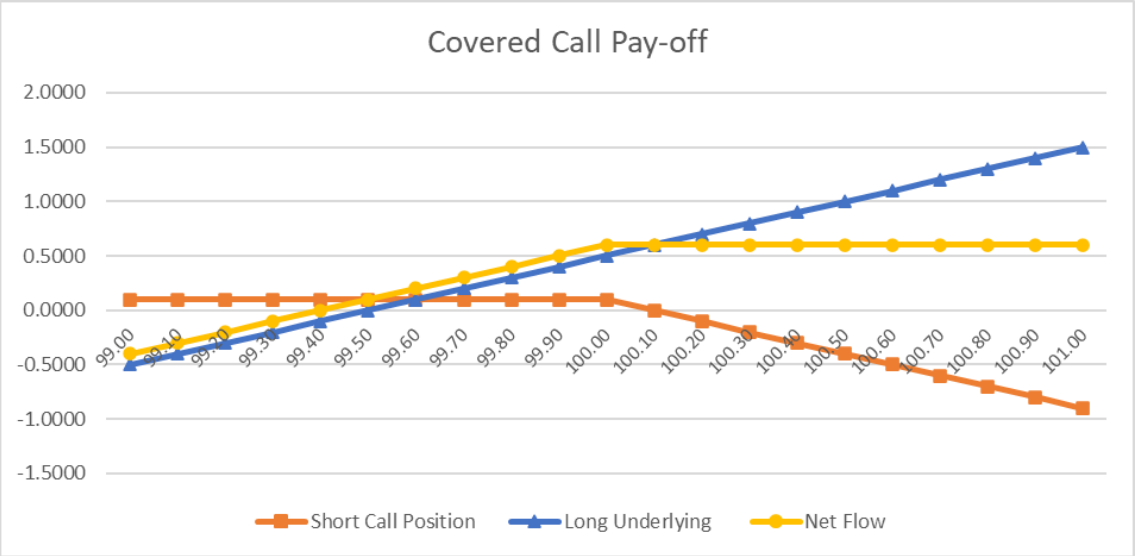
Suppose an investor buys a bond in the underlying market at Rs. 99.50 and also sells a call option with a strike price of Rs.100 at a premium of Rs.0.10, thereby earning Rs. 0.10 as premium. Combined position of long bond and short call would generate the pay-off as defined in the table and picture below:

Option Type	**Call**	**-**
Long/Short	**Short**	**Long Underlying**
Strike Price	100	99.5
Premium	0.1	-

GOI Security Price @ Expiry	**Short Call Position**	**Long Underlying**	**Net Flow[16]**
99.00	0.1000	-0.5000	-0.4000
99.10	0.1000	-0.4000	-0.3000
99.20	0.1000	-0.3000	-0.2000
99.30	0.1000	-0.2000	-0.1000
99.40	0.1000	-0.1000	0.0000
99.50	0.1000	0.0000	0.1000
99.60	0.1000	0.1000	0.2000
99.70	0.1000	0.2000	0.3000
99.80	0.1000	0.3000	0.4000
99.90	0.1000	0.4000	0.5000
100.00	0.1000	0.5000	0.6000
100.10	0.0000	0.6000	0.6000
100.20	-0.1000	0.7000	0.6000
100.30	-0.2000	0.8000	0.6000
100.40	-0.3000	0.9000	0.6000
100.50	-0.4000	1.0000	0.6000
100.60	-0.5000	1.1000	0.6000

[16] The coupon / accrued interest earned on holding bond is not considered for the calculation

GOI Security Price @ Expiry	Short Call Position	Long Underlying	Net Flow[16]
100.70	-0.6000	1.2000	0.6000
100.80	-0.7000	1.3000	0.6000
100.90	-0.8000	1.4000	0.6000
101.00	-0.9000	1.5000	0.6000



From the table and the pay-off chart we can see that the net position of a covered call strategy looks like 'short put' with a strike of 100 with premium Rs.0.60. This is called synthetic short put position. If at that point of time, a Rs.100 strike put is available at say 0.50, an arbitrage opportunity exists, where the trader can create a synthetic short put position (covered call), earn a Rs. 0.60 premium and use the proceeds to buy a Rs.100 strike put for Rs.0.50, thereby making a risk-free profit of Rs.0.10. Indeed, one needs to also provide for frictions in the market like brokerage, taxes, administrative costs, funding costs etc.

The most important factor in this strategy is the strike of the sold call option. If strike is close to the prevailing price of underlying bond, it would fetch higher premium upfront but would lock the potential gain from the bond early. And, if strike is too far from the current price of underlying, while it would fetch low upfront premium, would provide for longer ride of money on underlying bond. One has to decide on this subject based on one's view on the bond and choice between upfront premium from the option and potential gain from underlying.

A simple perspective on strike choice for covered call is that, till the time the cash market price does not reach the pre-determined exit price, the long cash position can be used to sell calls of that target strike price.

5.3.7 Protective Put

Any investor, long in the underlying bond market, always runs the risk of a fall in prices and thereby reduction of portfolio value and MTM losses. 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. What can be done to remain in the market, reduce losses but gain from the upside? By buying put options, the fund manager is effectively taking a bearish view on the bond prices (view that interest rate will go up) and if his view turns right, he will make profits on long put, which will be useful to negate the MTM losses in the cash market portfolio.

Suppose an investor buys a bond in the underlying market at Rs. 99.50 and also buy put option with a strike price of Rs.99.50 at a premium of Rs.0.20. Combined position of long bond and long put would generate the pay-off as defined in the table and pay-off chart below:

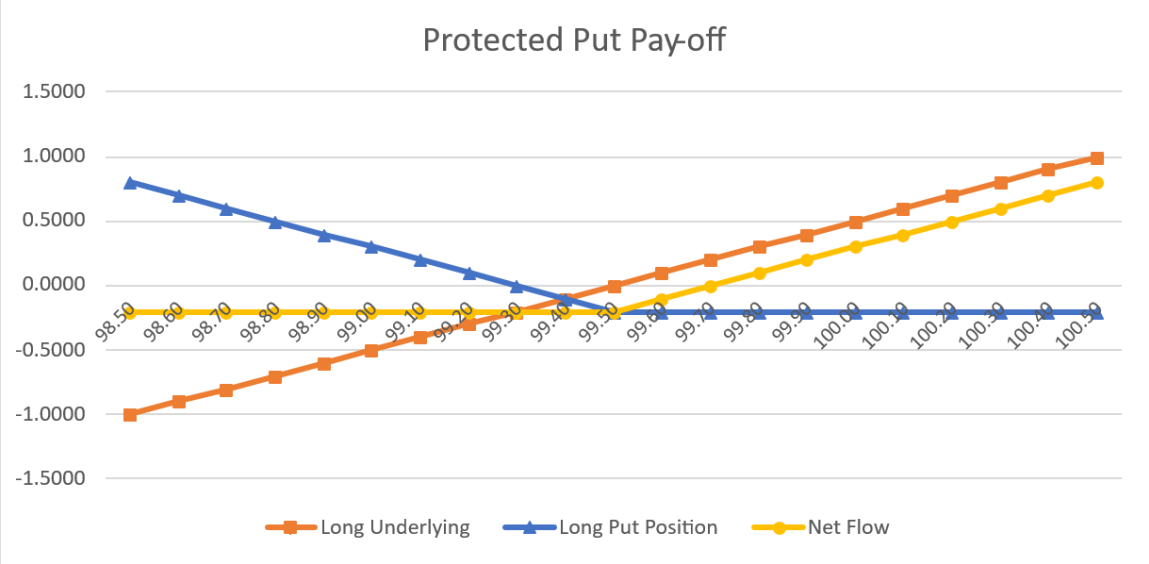
As price keeps rising, the profits will keep rising as losses in long put will be maximum to the extent of premium paid, but profits in long cash will keep increasing. Combined position would look like as follows:

Option Type	**-**	**Put**
Long/Short	**Underlying Long**	**Long**
Strike Price	99.5	99.5
Premium	-	0.2

GOI Security Price @ Expiry	**Long Underlying**	**Long Put Position**	**Net Flow[17]**
99.00	-0.5000	0.3000	-0.2000
99.10	-0.4000	0.2000	-0.2000
99.20	-0.3000	0.1000	-0.2000
99.30	-0.2000	0.0000	-0.2000
99.40	-0.1000	-0.1000	-0.2000
99.50	0.0000	-0.2000	-0.2000
99.60	0.1000	-0.2000	-0.1000
99.70	0.2000	-0.2000	0.0000
99.80	0.3000	-0.2000	0.1000
99.90	0.4000	-0.2000	0.2000
100.00	0.5000	-0.2000	0.3000
100.10	0.6000	-0.2000	0.4000
100.20	0.7000	-0.2000	0.5000
100.30	0.8000	-0.2000	0.6000
100.40	0.9000	-0.2000	0.7000
100.50	1.0000	-0.2000	0.8000
100.60	1.1000	-0.2000	0.9000

[17] The coupon / accrued interest earned on holding bond is not considered for the calculation

GOI Security Price @ Expiry	Long Underlying	Long Put Position	Net Flow[17]
100.70	1.2000	-0.2000	1.0000
100.80	1.3000	-0.2000	1.1000
100.90	1.4000	-0.2000	1.2000
101.00	1.5000	-0.2000	1.3000



This strategy can be used to hedge against the bond holding. This will limit loss in case of increase in bond prices as against short futures where profit of underlying bond is getting set-off against loss in futures.

5.3.8 Butterfly Spread

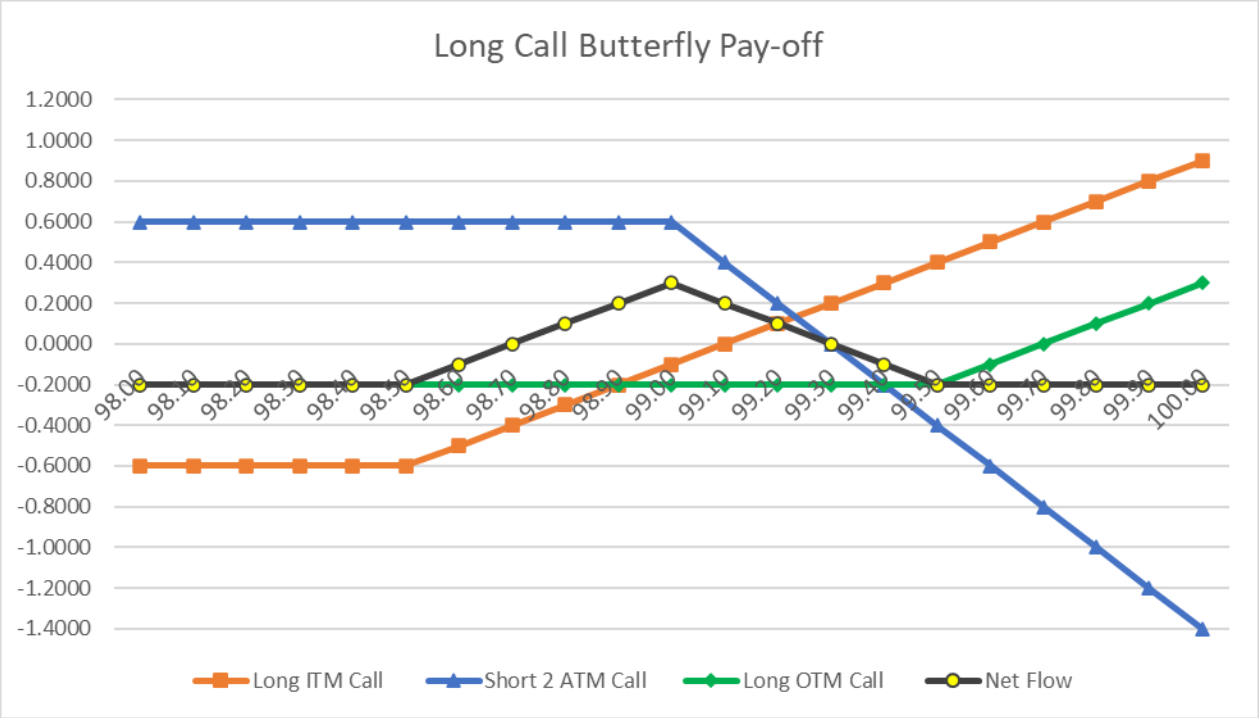
A butterfly spread is an options strategy that combines both bull and bear spreads. These are neutral strategies that come with a fixed risk and capped profits and losses. These spreads use four options and three different strike prices. There are multiple butterfly spread strategies like long call butterfly spreads, Short call butterfly spreads, Long put butterfly spread, Short put butterfly spread, Iron Butterfly Spread etc. We will see in detail "Long Call Butterfly spread" for understanding purpose.

Long Call Butterfly

Long Call Butterfly is a neutral strategy where very low volatility in the price of underlying is expected. The strategy is a combination of Bull Spread and Bear Spread. It involves Buy 1 ITM Call, Sell 2 ATM Calls and Buy 1 OTM Call. The strike prices of all Options should be at equal distance from the current price. The risk limited to net premium paid and profit is limited to difference between adjacent strikes minus net premium debit.

Option Type	Call	Call	Call
Long/Short	Long	Short	Long
Strike Price	98.5	99	99.5
Premium	0.6	0.3	0.2
No. of Lot	1	2	1
Spot	99.000		

GOI Security Price @ Expiry	Long ITM Call	Short 2 ATM Call	Long OTM Call	Net Flow
98.00	-0.6000	0.6000	-0.2000	-0.2000
98.10	-0.6000	0.6000	-0.2000	-0.2000
98.20	-0.6000	0.6000	-0.2000	-0.2000
98.30	-0.6000	0.6000	-0.2000	-0.2000
98.40	-0.6000	0.6000	-0.2000	-0.2000
98.50	-0.6000	0.6000	-0.2000	-0.2000
98.60	-0.5000	0.6000	-0.2000	-0.1000
98.70	-0.4000	0.6000	-0.2000	0.0000
98.80	-0.3000	0.6000	-0.2000	0.1000
98.90	-0.2000	0.6000	-0.2000	0.2000
99.00	-0.1000	0.6000	-0.2000	0.3000
99.10	0.0000	0.4000	-0.2000	0.2000
99.20	0.1000	0.2000	-0.2000	0.1000
99.30	0.2000	0.0000	-0.2000	0.0000
99.40	0.3000	-0.2000	-0.2000	-0.1000
99.50	0.4000	-0.4000	-0.2000	-0.2000
99.60	0.5000	-0.6000	-0.1000	-0.2000
99.70	0.6000	-0.8000	0.0000	-0.2000
99.80	0.7000	-1.0000	0.1000	-0.2000
99.90	0.8000	-1.2000	0.2000	-0.2000
100.00	0.9000	-1.4000	0.3000	-0.2000



Cost of creating long call butterfly spread = (0.30*2)-0.60-0.20 = -0.20
Lower BEP = 98.50+0.20 = 98.70
Upper BEP= 99.50-0.20=99.30
This position can also be created with the help of only puts or combination of calls and puts.

5.4 Use of Interest Rate Derivatives for Speculative Transaction

In the earlier sections we have seen use of interest rate derivatives for hedging an actual interest rate exposure. In this section, we will see its use by speculators. As explained earlier, speculators take a view on the market with an objective to profit from it. Let us take an example.

5.4.1 View Based Trading - Long Position in Bond:

A trader has a view that interest rate/yield will decrease in near futures, so bond prices will go up. Trader can either buy bond or take long position in bond future. Let us compare the return in both scenarios:

Particular	**Underlying Bond**	**10-yr Futures**
Underlying	6.45% GOI 2029	6.45% GOI 2029 Expiry March 2020
Strategy	Buy Underlying Bond	Take long position in GOI bond IRF
Trade date	**March 02, 2020**	

Trade Price (A)	Rs.100.70	Rs. 100.62
Traded value (B)	Rs 5 lac (5000 bonds)	Rs 1 Crore (Assuming 5% Margin able to leverage 20 times)
Trade date/Expiry	**March 26, 2020**	
Trade Price (C)	Rs. 101.59	Rs.101.59
Strategy	Sell underlying	Position will expire
Profit D= (C-A)*B/100	Rs. 4450.00	Rs.97000.00
Accrued interest (E)	Rs. 2150.00	Nil
Total Income (D+E)	**Rs. 6600**	**Rs. 97000**

Since IRD is a leverage product there is a possibility of higher profit at the same time there is possibility of higher loss. In above case if view of the speculator is not right, he will incur loss multiple times compared to underlying bond also speculator will not earn any accrued interest for long position in interest rate futures.

Let us see another example without leveraging and investing remaining funds in money market instrument.

Particular	**Underlying Bond**	**10-yr Futures**
Underlying	6.45% GOI 2029	6.45% GOI 2029 Expiry March 2020
Strategy	Buy Underlying Bond	Take long position in GOI bond IRF and invest surplus in CD for 24 days
Trade date	**March 02, 2020**	
Trade Price (A)	Rs.100.70	Rs. 100.62
Traded value (B)	Rs. 5 lacs (5000 bonds)	Rs.5 Lacs – IRF and invest remaining amount in 24 days CD
Trade date/Expiry	**March 26, 2020**	
Trade Price (C)	Rs. 101.59	Rs.101.59
Strategy	Sell underlying	Position will expire
Profit D= (C-A)*B/100	Rs. 4450.00	Rs.4850
Accrued interest (E)	Rs. 2150.00	Nil
Return on CD (F)	Nil	Rs. 2300
Total Income (D+E+F)	**Rs. 6600**	**Rs. 7150**

In both the example given above in case price of bonds decreases the trader will have loss and the loss can be unlimited. With the help of option contract the trader can limit his loss and maximize the profit. For taking long position, the trader can buy call option instead of buying future contract.

5.4.2 View Based Trading - Short Position in Bond

A trader has a view that interest rate will increase/bond yield will reduce in near futures, so bond prices will go down. In India, not all participants are allowed to do short sell in government of India securities. Hence, Interest rate derivatives will be the good choice to take such view. The trader can either sell GOI bond futures or he can buy the GOI bond put option contracts to take the short position in bond.

5.4.3 Changing the duration of the portfolio

Fund manager who have strong expectations about the direction of interest rates, will adjust the duration of their portfolio to capitalize on their expectations. If they expect interest rates to increase, they will lengthen the duration of portfolio and vice versa. Also, anyone using structured portfolio strategies must periodically adjust the portfolio duration to match the duration of some benchmark.

Although money managers can alter the duration of their portfolio with cash market instruments, a quick and less expensive means for doing so is to use futures contracts. By buying futures contract on GOI bond, they can increase the duration of portfolio and vice versa.

5.5 Use of Interest Rate Derivatives by Arbitragers

As mentioned earlier, Arbitragers look for mispricing in the market and execute simultaneous buy and sell to capture the mispricing and make profit. They do not take any view on the market direction. Let us take an example.

5.5.1 Regular Arbitrage with Single Bond Interest Rate Futures

In this strategy, arbitrageur buy bond in underlying market and sell futures of same bond. This strategy is generally possible when futures price is more than the theoretical future price.

Example:

Strategy: Buy GOI bond in underlying and sell GOI bond Futures.
On August 03, 20XX, 7.59% GOI 20XX trading at 102.60 and IRF August Expiry trading at 102.62.
Sell Interest Rate Futures at INR 102.62. Lot = 500
Buy Underlying at INR 102.60 Face Value = INR 10 Crores
Cost of Borrowing in Repo 5%

On August Expiry - if 7.59% GOI 20XX price

Case I	**Case II**
INR 102.30	INR – 102.80

Net Pay-off:

CASE I			**CASE II**	
Accrued Interest	442750		Accrued Interest	442750
Profit in IRF position	320000		Profit on Underlying	200000
Cash Inflow (A)	**762750**		**Cash Inflow (A)**	**642750**
Loss in Underlying Bond	(300000)		Loss in IRF	(180000)
Cost of Borrowing	(295151)		Cost of Borrowing	(295151)
Cash Outflow (B)	**(595151)**		**Cash Outflow (B)**	**(475151)**
Net Pay-off (A-B)	**167599**		**Net Pay-off (A-B)**	**167599**

You can see that in both the cases (increase in bond prices / decrease in bond prices) there is positive net pay-off and it remains the same. One needs to also provide for frictions in the market like brokerage, taxes, administrative costs, funding costs etc.

5.5.2 Reverse Arbitrage with Single Bond Interest Rate Futures

In this strategy arbitrageur sell GOI bond in underlying market, lend money in repo market against same GOI bond and buy futures of same GOI bond. This strategy is generally possible when futures price is lower than the theoretical future price.

Example:

Strategy: Sell GOI bond in underlying and buy GOI bond Futures and lend money in repo market (against the same GOI bond to make delivery in underlying market). In case, arbitrageur already holds the underlying bond, he can lend money till expiry of bonds in any risk-free instruments.

On August 03, 20XX, 7.59% GOI 20XX trading at 102.60 and IRF August Expiry trading at 102.40.
Buy Interest Rate Futures at INR 102.40. Lot = 500
Sell Underlying at INR 102.60. Face Value = INR 10 Crores
Lend money in repo against 7.59% GOI 20XX @ 5%

On August Expiry - if 7.59% GOI 20XX price

Case I	**Case II**
INR 102.30	INR – 102.80

Net Pay-off:

CASE I	
Profit on Underlying	300000
Income from lending	295151
Cash Inflow (A)	**595151**
Accrued Interest	(442750)
Loss on IRF	(100000)
Cash Outflow (B)	**(542750)**
Net Pay-off (A-B)	**52401**

CASE II	
Profit on IRF	400000
Income from lending	295151
Cash Inflow (A)	**695151**
Accrued Interest	(442750)
Loss on Underlying	(200000)
Cash Outflow (B)	**(642750)**
Net Pay-off (A-B)	**52401**

You can see that in both the cases (increase in bond prices / decrease in bond prices) there is positive net pay-off and it remains the same. One needs to also provide for frictions in the market like brokerage, taxes, administrative costs, funding costs etc.

5.5.3 Creating Synthetic Securities for Yield Enhancement

A cash security can be synthetically created by using position of futures contract together with underlying bonds. The yield on the synthetic security should be same as the yield on the cash market security.

Consider an investor who wants to invest money for three months. This Investor can take long position in 15-yr GOI bond in underlying market and short three month futures of the same bond. The maturity of the bond is 15 years, but the investor has effectively shortened the maturity of the bond to three months. Consequently, the long position in 15-yr bond and the short position in futures are equivalent to a long position in three month riskless security. The position is riskless because the investor has locked-in the price he/she will receive after three months. With long position in 15-yr bond and the short position in futures, the investor has synthetically created a 3 month T-Bills. In case the yield of 3 month synthetic T-Bills is greater than the yield of cash market 3 month T-Bills yield, the investor can realize the enhance yield by creating synthetic short term security.

Here, it may be interesting to look at the risks these arbitragers carry. As seen before, arbitragers are executing positions in two or more markets/products simultaneously. Even if the systems are seamless and electronic and both the legs of transaction are liquid, there is a possibility of some gap between the executions of both the orders. If either leg of the transaction is illiquid then the risk on the arbitrage deal is huge as only one leg may get executed and another may not, which would open the arbitrager to the naked exposure of a position. Similarly, based on settlement type (cash/physical delivery), it may need reversal of trades in the respective markets, which would result in additional risk on

unwinding position with regard to simultaneous execution of the trades. Further, in certain cases regulation does not permit to take certain kind of transaction: for example, in case of reverse arbitrage example, short sell of bonds in underlying market may not be allowed to all participants. Also, in above examples, the transaction cost and impact cost have not been considered. In real life, the transaction cost like the brokerage, stamp duty, margin cost and impact cost etc. need to be taken into account before entering into any strategies. There are certain other limitations of exchange traded interest rate derivatives contract which we will discuss in detail in subsequent section.

5.6 Trading spreads using ETIRD

Spread refers to difference in prices of two futures / option contracts. A good understanding of spread relation in terms of contract spread is essential to earn profit. Considerable knowledge of a particular bond is also necessary to enable the trader to use spread trading strategy.

Calendar Spread: A calendar spread is a contract where a trader buys/sells a particular month contract (Futures or Options) and sells/buys (take an opposite position) of the same contract of a different month. Both have the same underlying but different maturities. In calendar trade position trader does not have risk of underlying security movement but only have basis risk due to change in the spread between two contracts. Hence, the margins applicable on this position are much lower than the normal margin[18].

Example: Trader is of a view that the spread between near month and mid-month may widen. On the basis of this view, he decides to sell September (Near month contract) 6.10% GOI 2031 bond futures @99.00 and at the same time buy October (mid-month) futures contract @99.05; the spread between the two contracts is Rs. 0.05. Let's say after 10 days, as per his expectation spread widen and now the September futures contract is trading at 98.80 and October futures contract is trading at 98.95, the spread now stands at Rs. 0.15. He decides to square off his both the positions, making a gain of Rs. 200 per contract (= 0.15 – 0.05 = 0.10 and this 0.10 x 2000) in whole transaction. The issue with entering a calendar spread in 2 different orders like above is that there is a risk that the price moves between placing both the orders i.e., execution risk. Such risk can be avoided by using spread order[19] facility provided by Exchanges.

Inter-Bond Spread: An inter-bond pair spread is a long-short position in futures on different underlying GOI bonds. Both typically have the same expiry date. For example, a trader can buy 6.10% GOI bond 2031 futures and sell 5.85% GOI bond 2030 futures both of October expiry. (10-yr maturity bucket bonds) or can buy 6.10% GOI bond 2031 futures and sell 7.27% GOI bond 2026 futures both of October expiry (10-yr bond vs 5-yr bond trading). Generally, if trader anticipates steepening or flattening of yield curve, trader may use inter-bond spread strategy.

[18] Refer calendar spread charge section 7.10.1.1.3

[19] Refer spread order book section 6.2.5

5.7 Limitation of Interest Rate Derivatives for Hedgers

Exchange traded interest rate derivatives contracts are standard contracts which are mainly settled in cash i.e., without delivery of securities. This may lead to imperfect hedging and have certain basis risk for Hedgers.

For example, GOI single bond derivatives contract expires on the last Thursday day of contract month. If the exposure to be hedged has maturity of some other day in the month, there will be mismatch in the maturity and leads to imperfect hedging.

The Exchange Traded Interest Rate Derivatives (ETIRD) are not available on all kinds of fixed income instruments and all maturity tenors. However, participants may have various kinds of fixed income instruments. The movement in underlying instrument of ETIRD and portfolio of participant may not be identical which leads to imperfect hedge. For example, hedging of different maturity GOI bond and corporate bond portfolio with single GOI bond futures and options or Investor wants to hedge against floating housing loan through ETIRD may not be possible as the underlying interest rate for housing loan and ETIRD may not have much correlation.

As ETIRD are mainly cash settled, there might be a mismatch in the time/price of cancellation of contract in ETIRD and the time/price of actual underlying trade. This mismatch may result in small loss of value.

However, the transparency, small lot size and ease of trade execution may offset the above limitation of ETIRD.

Sample Questions

1. Hedging for multiple bonds in portfolio can be done by using _____.
    a. **Duration based hedge ratio**
    b. Market value ratio
    c. Year to maturity ratio
    d. None of the above

2. In Bullish vertical spread using put strategy, trader _____.
    a. **buy put option with lower strike and sell a put option with higher strike**
    b. buy put option with higher strike and sell a put option with lower strike
    c. buy call with lower strike and sell a put option with higher strike
    d. None of the above

3. If you expect the interest rate will go up in future, today you should _____.
    a. **Sell GOI Bond futures**
    b. Buy GOI bond futures
    c. Buy underlying bond
    d. None of the above

4. A _____ is where a trader buys a particular month contract (Futures or Options) and sell (i.e., take an opposite position) of the same contract of a different month.
    a. **Calendar spread**
    b. Option spread
    c. Contract spread
    d. All of the above

5. Limitation of Interest Rate Derivatives for Hedgers is mainly due to _____.
    a. Standardised Contract
    b. Non-availability on all kind of underlying instruments
    c. **Both (a) and (b) above**
    d. None of the above

CHAPTER 6: TRADING MECHANISM IN EXCHANGE TRADED INTEREST RATE DERIVATIVES

LEARNING OBJECTIVES:

After studying this chapter, you should know about following:

- Entities in Trading System and Their Role
- Features of Exchange Trading System
- Order Management, Risk Management and Order Routing
- Price Limit Circuit Filter and Trading Costs

Introduction

The stock Exchanges provide a trading platform where the buyers and sellers (investors) can meet to transact in securities. An Exchange provides multiple segments in which Equity, Equity Derivatives, Currency Derivatives, Commodity Derivatives, Interest Rate Derivatives, Debt Securities are traded. Generally, the segments are specific to underlying asset, for example in Equity derivatives segment trading take place in futures and option with underlying as equity or equity indices. Similarly, in Commodity derivatives segment trading take place in futures and options with underlying as commodity or commodity indices. However, Exchange Traded Interest Rate Derivatives (ETIRD) is not traded as a separate segment but is a part of Currency derivatives segment in stock exchanges. As is the norm for all derivatives Exchanges, the trading and settlement are conducted by two distinct legal entities: trading by Exchange and settlement (along with the associated process of Clearing) by Clearing Corporation (CC).

The Securities Contract (Regulation) Act, 1956 (SCRA) defines 'Stock Exchange' as (a) anybody of individuals, whether incorporated or not, constituted before corporatization and demutualization under sections 4A and 4B, or (b) a body corporate incorporated under the Companies Act, 1956 (1 of 1956) whether under a scheme of corporatization and demutualization or otherwise, for the purpose of assisting, regulating or coordinating the business of buying, selling or dealing in securities. In India, investors cannot access the Exchange platform directly. They have to compulsorily trade through registered stock brokers/trading member of the Exchanges. Hence, stock brokers/trading members are one of the important intermediaries of securities market.

In this chapter we will focus on trading mechanism of Exchange traded interest rate derivatives (which is part of currency derivatives segment) namely, entities in trading system, trading system of Exchange and its features, order management, risk management features at the time of order routing, trading cost etc.

6.1 List of Entities in the Trading System

In this section we will discuss about few important entities of trading system and their role.

6.1.1 Stock Exchanges

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. Stock Exchanges ensure equal access to investors across the nation through an appropriate communication network. Exchanges set out and implement rules and regulations to govern the securities market. These rules and regulations extend to member registration, securities listing, transaction monitoring, compliance by members to SEBI / RBI regulations, investor protection etc.

Typical functions of Stock Exchanges are:

- Provide trading platform
- Dissemination of information
- Investor education, awareness and protection
- Facilitate redressal mechanism
- Surveillance and Investigation
- Listing of securities and monitoring compliance of listed companies
- Inspection and monitoring of member compliance

Currently, BSE Ltd., National Stock Exchange of India Ltd. and Metropolitan Stock Exchange of India Limited (MSEI) facilitates trading in Interest Rate Derivatives contract in their respective Currency Derivatives Segment.

6.1.2 Clearing Corporations (CC)

Clearing Corporation does clearing, settlement and risk management for trades executed on Exchanges. Also provide settlement guarantee for such trades. We will examine the functions of CC in detail in subsequent chapter.

6.1.3 Trading Member and Authorised Person

An important constituent of the securities market is a trading member/ stock broker[20] who is a member of the stock exchange. Stock Broker eligibility criteria is specified under SEBI Stock Broker Regulations 1992 and Securities Contracts Regulations Rules 1957. A trading member is allowed to execute trades on his own account as well as on account of his clients. A trading member can be an individual (sole proprietor), a partnership firm, Limited Liability Partnership, Corporate or a bank[21] who is a member of a Stock Exchange.

[20] Stock broker" means a person having trading rights in any recognized stock exchange and includes a trading member;

[21] Banks are permitted to become member of the currency derivative segment of recognized stock Exchanges subject to fulfillment of minimum prudential requirements

Authorized person[22] is not a member of a Stock Exchange but is 'Any person, individual, partnership firm, LLP or body corporate, who is appointed as such by a Stock Broker (including Trading Member) and who provides access to trading platform of a Stock Exchange as an agent of the Stock Broker'. For executing trades in ETIRD on own as well as client account, a trading member has to take membership of Currency Derivatives Segment of the Exchange. The admission as a trading member on the Stock Exchanges is based on the various criteria like age, capital adequacy, financial track record, education, experience and fulfilment of criteria of "fit & proper person" as laid down in the SEBI (Intermediaries) Regulations, 2008. The Exchanges may stipulate additional requirements over and above the SEBI prescribed rules. To get the access of trading system, dealer (who will enter deal in trading system) of the trading member should successfully certified specific module of NISM. Though NISM-Series-I: Currency Derivatives Certified dealer can get access to trading system of currency derivatives segment, however the dealer is not eligible to enter order in Interest Rate Derivatives product till he successfully certified either NISM-Series-XIII Common Derivatives Certification Examination or NISM-Series-IV: Interest Rate Derivatives Certification Examination. The membership for currency derivatives segment can be taken individually or in combination like only trading member, trading cum self-clearing member and trading cum clearing member. Trading member category of membership entitles a member to execute trades on his own account as well as on account of his clients but, clearing and settlement of trades executed through the Trading Member would have to be done through a Trading-cum Clearing Member or Professional Clearing Member of the Exchange.

6.1.4 Clearing Members

Clearing Members have clearing and settlement rights in any recognised clearing corporation. Clearing Member helps in clearing of the trades of their clients. There are three kinds of clearing members - Professional Clearing Members (PCM), Trading Cum Clearing Member (TCM) and Self Clearing Member (SCM). We will examine the role of all these entities in next chapter.

6.1.5 Investor / Client

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. The investor can be retail individual investor, High net-worth investors, domestic institutional investor like banks, mutual funds etc., foreign portfolio investor, corporate entities etc. Clients have the option of placing their orders through various channels like internet, phone, direct market access (DMA) (for institutional clients), Securities trading using wireless technology facility (STWT), etc. To participate in ETIRD, investor has to open a trading account with the trading member of currency derivative segment of the Exchange and complete the necessary procedure related to account opening, KYC, etc. Once the KYC and other details

[22]https://www.sebi.gov.in/legal/circulars/aug-2018/role-of-sub-broker-sb-vis-a-vis-authorized-person-ap-39825.html (Discontinuation of Sub-broker category)

thereon are complete, each client is assigned a unique client code (UCC) by the broker. This acts as an identity for the client with respect to the broker. SEBI has made it mandatory for all the brokers to use unique client codes for all clients while entering orders on their behalf. It is also mandated by SEBI, that the unique client code should be mapped with the PAN number of the client. The broker has to provide the Stock Exchange with the UCC and the PAN details of the client before entering any order/trade on behalf of the client. The Stock Exchanges provide an upload facility to the brokers through which the UCC and other client details are uploaded on the stock exchange platform on a regular basis. If the broker fails to register the unique client code with the Exchange, he is liable to be penalized.

6.2 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. Important features of Exchange trading system:

- Screen based trading system.
- Fully automated: No manual intervention.
- Transparent: Quantity and price information related to order and trade is disseminated on the trading system on real time basis.
- Anonymous order matching: The identity of buyer and seller is not revealed to market. Only price and quantity information are available on the system. It is order driven platform where order matching is done strictly on price-time priority basis.
- Higher speed of execution: Handling of multiple orders and trade execution.
- Connected to multiple interfaces: Trading system is connected to clearing corporation system, surveillance system of the Exchanges, data vendors system for dissemination of data.
- Risk management facility: To avoid mainly order entry related errors.
- Nationwide reach: Trading members/participants can have access from any part of the country
- Trading member can connect to the trading system of the Exchange by various mode such as lease line, Internet, co-location[23] etc.

6.2.1 Trader Workstation (TWS)

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

[23] The facility of co-location or proximity hosting (or by whatever name called) is offered by the stock exchanges to stock brokers and data vendors whereby their trading or data-vending systems are allowed to be located within or at close proximity to the premises of the stock exchanges, and are allowed to connect to the trading platform of stock exchanges through direct and private network

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. As mentioned earlier, dealer (who will enter deal through TWS) of the trading member should successfully certified specific module of NISM.

TWS provides mainly two kinds of information which are:
Trading member's own transaction Information:

- Order entered
- Order Modified
- Outstanding Order
- Order Log
- Trade details

Market Information:

- Order book
- Securities / contract price information
- Securities / contract trade information
- Additional information

Since for cash settled GOI bond futures and option, final settlement is weighted average price of the underlying bond based on the prices during the last two hours of the trading on NDS-OM, Exchanges TWS also disseminated the trade prices of underlying GOI securities traded on NDS OM on real-time basis.

Exchanges have allowed members to develop their customized trading workstation as per their requirements and connect to Exchange trading system. Under this facility, the Exchanges has made available product such as Computer to Computer Link (CTCL) / Internet based trading (IBT) / Direct Market Access (DMA) / Security trading thought wireless technology facility (STWT) / Automated / Algorithm Trading (ALGO) / Smart order router (SOR) to the Trading Members.

6.2.2 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. To strengthen the regulatory provisions against un-authorized trades and to harmonise the requirements across equity & derivative market, all brokers shall execute trades of clients only after keeping evidence of the client placing such order, it could be, inter alia, in the form of: (a) Physical record written and signed by client, (b) Telephone recording, (c) Email from authorized email id, (d) Log for internet transactions, (e) Record of SMS messages, (f) Any other legally verifiable record.

When a dispute arises, the broker shall produce the above-mentioned records for the disputed trades. SEBI further instructed that wherever the order instructions were received from clients through the telephone, the stock broker shall mandatorily use telephone recording system to record the instructions and maintain telephone recordings as part of its records[24]. The Brokers are required to maintain the records for a minimum period for which the arbitration accepts investors' complaints as notified from time to time (which is currently three years). However, in cases where dispute has been raised, such records shall be kept till final resolution of the dispute. If SEBI desires that specific records be preserved, then such records shall be kept till further intimation by SEBI.

Internet trading can take place through order routing systems, which will route client orders to exchange trading systems for execution. Thus, a client sitting in any part of the country would be able to trade using the Internet as a medium through brokers' Internet trading systems. SEBI-registered brokers can introduce internet based trading after obtaining permission from respective Stock Exchanges. SEBI has stipulated the minimum conditions to be fulfilled by trading members to start internet based trading and services. Direct Market Access (DMA) is a facility which allows brokers to offer clients direct access to the exchange trading system through the broker's infrastructure without manual intervention by the broker. Some of the advantages offered by DMA are direct control of clients over orders, faster execution of client orders, reduced risk of errors associated with manual order entry, greater transparency, increased liquidity, lower impact costs for large orders, better audit trails and better use of hedging and arbitrage opportunities through the use of decision support tools / algorithms for trading. SEBI in 2008, introduced Direct Market Access (DMA) and permitted institutional investors to use DMA facility. The facility of the DMA provided by the stock broker shall be used by the client or an investment manager of the client. A SEBI registered entity is permitted to act as an investment manager on behalf of institutional clients. In case the facility of DMA is used by the client through an investment manager, the investment manager is required to execute the necessary documents on behalf of the client(s). Exchange can also specify the categories of investors to whom the DMA facility can be extended. SEBI-registered brokers can introduce DMA facility to their clients after obtaining permission from respective Stock Exchanges. Brokers must specifically authorize clients or investment managers acting on behalf of clients for providing DMA facility, after fulfilling KYC requirements, documentation and carrying out necessary due diligence, records of which should be properly maintained. The broker shall be fully responsible and liable for all orders emanating through their DMA systems. It shall be the responsibility of the broker to ensure that only clients who fulfill the eligibility criteria are permitted to use the DMA facility.
Another feature which has been introduced in the Indian securities market is Algorithmic Trading and High Frequency Trading. Algorithmic Trading – Any order that is generated

[24] SEBI Circular Ref No.: SEBI/HO/MIRSD/DOP1/CIR/P/2018/54Dated March 22, 2018.

using automated execution logic shall be known as algorithmic trading[25]. "Automated Trading" shall mean and include any software or facility by the use of which, upon the fulfillment of certain specified parameters, without the necessity of manual entry of orders, buy/sell orders are automatically generated and pushed into the trading system of the Exchange for the purpose of matching. SEBI has advised the stock exchanges to ensure that all algorithmic orders are necessarily routed through broker servers located in India and the stock exchange has appropriate risk controls mechanism to address the risk emanating from algorithmic orders and trades. The minimum order-level risk controls shall include price check and quantity limit check. Stock exchange shall ensure that the stock broker shall provide the facility of algorithmic trading only upon the prior permission of the stock exchange. The stock broker, desirous of placing orders generated using algos, shall satisfy the stock exchange with regard to the implementation of the minimum levels of risk controls at its end as specified by SEBI and Exchanges from time to time. The stock brokers that provide the facility of algorithmic trading shall subject their algorithmic trading system to a system audit every six months in order to ensure that the requirements prescribed by SEBI / stock exchanges with regard to algorithmic trading are effectively implemented.[26] High frequency trading (HFT) is a type of algorithmic trading which is latency sensitive and is characterized by a high daily portfolio turnover and high order-to trade ratio (OTR).

SEBI vide circular dated February 04, 2025[27] provided guidelines for Retail Investors participation in Algorithmic trading through brokers. The circular provided guidelines on use of Application Programming Interface (API) for Algo trading by retail investors, roles and responsibilities of stock brokers and stock exchanges, empanelment and registration of Algo Providers, categorization of Algos etc.

Once the orders are received by the broker, it is confirmed with the client and then entered into the trading system of the Exchange. The Exchange gives confirmation of the order and time stamps it. An order generally comes with certain conditions which determine whether it is a market order, limit order, etc. (discussed in section 6.3.1). These specify the terms and conditions at which the client wants his/her order to get executed.

6.2.3 Process of order routing through the Exchanges

Once the order is entered and confirmed by the client/dealer at his trading terminal and verified by the broker software, the order is routed to the Exchange for its execution. The Exchange system allots a unique order number for all orders received in the system. This is given as order confirmation along with the time stamp to the broker.

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[25] SEBI Circular Ref. no. CIR/MRD/DP/09/2012 Dated March 30, 2012.

[26] SEBI/HO/MRD2/PoD-2/CIR/P/2023/171 dated October 16, 2023 "Master Circular for Stock Exchange and Clearing Corporation, Chapter 2 - Trading Software and Technology" & SEBI/HO/MRD1/DSAP/CIR/P/2020/234 dated November 24, 2020.

[27] https://www.sebi.gov.in/legal/circulars/feb-2025/safer-participation-of-retail-investors-in-algorithmic-trading_91614.html

The order gets executed at the Exchange depending upon the type of order. If the order is a market order, it gets executed immediately, subject to availability of counter order. If it is a limit order, it is matched against appropriate counter orders. Once the order is matched, a trade is said to be executed. As soon as a trade is executed, the trade confirmation message along with time stamp will be automatically available on the trading terminal of broker. All orders can be modified or cancelled during the trading hours provided they are not fully executed. For the orders, which are partially executed, only the open or unexecuted part of the order can be cancelled / modified.

6.2.4 Order Book

The term "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/lots being bid on or offered at each price point, or market depth. It also provides number of orders at each price level. The Exchange order book is generally available up to five price level based on the priority of matching. The identities of market participants remain anonymous. The order book helps to improve market transparency as they provide information on price, availability, depth of trade. An order book is dynamic, meaning it's constantly updated in real-time throughout the day.

Below is example of typical order book:

Contract: 6.10% GOI Bond 2031 Futures Expiry:28102021

No. of Orders	Buy Qty./ Lot *	Buy Price	Sell Price	Sell Qty./ Lot	No. of Orders
2	35	98.5500	98.5625	10	1
3	25	98.5425	98.5700	11	3
1	38	98.5400	98.5750	184	2
10	78	98.5300	98.5800	42	1
1	1	98.5250	98.5975	86	4
Total Buy Qty / Lot	3525		Total Sell Qty / Lot	4250	

*Trading in case of derivatives is mainly in lot size. In such cases, number of lots.

Left hand side of order book provide buy order details and Right hand side of order book provide sell order details. "Number of orders" column provide information about number of unique orders available at the given price point. Quantity columns provide total quantity / lot available at given price point. Buy price information is provided in descending order i.e., from highest to lowest price and sell price information is provided in ascending order i.e., lowest price to highest price. Generally, order depth up to five price point is provided at each side. Additionally, total buy order quantity and total sell order quantity of overall market is also provided.

6.2.5 Spread Order Book

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. The dealer can set up the spread combination contract on TWS and place Buy Spread order (BSP) and Sell Spread order (SSP) with individual contracts defaulted for leg1 and leg2.

For example, 6.10% GOI bond 2031 future OCT21NOV21 spread contract allows participants to trade between difference of price between 6.10% GOI bond 2031 future NOV21 (Far month contract/2nd leg contract) expiry and OCT21 (near month contract/1st leg contract) expiry. The difference which is shown on the spread contract can be positive, negative, or zero, which is not possible for all other contracts other than spread contracts. The orders are matched in spread order book on price-time priority only, where price is basically difference between far month contract and near month contract. Once spread order is matched, the trades shall be executed at following prices:
Traded price for the first leg contract = Reference price
Traded price for the second leg contract = Reference price + the price difference entered for the spread order
where, Reference price = Last Traded Price of the first leg contract.

Spread Contract: 6.10% GOI Bond 2031 OCT21NOV21 futures

No. of Orders	Buy Qty./ Lot *	Buy Price	Sell Price	Sell Qty./ Lot	No. of Orders
2	35	0.06	0.10	10	1
3	25	0.03	0.11	11	3
1	38	0.01	0.12	184	2
1	78	0.00	0.14	42	1
1	1	-0.01	0.15	86	4
Total Buy Qty / Lot	3525		Total Sell Qty / Lot	4250	

*Trading in case of derivatives is mainly in lot size. In such cases, number of lots.

A buy side spread means sell near month leg (first leg) and buy in far month leg (second leg). A sell side spread means buy in near month leg (first leg) and sell in far month leg (second leg). Buy spread order of 10 lots in 6.10% GOI Bond 2031 OCT21NOV21 futures mean: sell 10 lots in 6.10% GOI Bond 2031 OCT21 futures and buy 10 lots in 6.10% GOI Bond 2031 NOV21 futures. Similarly, sell spread order of 10 lots in 6.10% GOI Bond 2031 OCT21NOV21 futures mean: buy 10 lots in 6.10% GOI Bond 2031 OCT21 futures and sell 10 lots in 6.10% GOI Bond 2031 NOV21 futures.

The issue with entering a calendar spread in 2 different orders is that there is a risk that the price moves between placing both the orders and higher margin requirement you

would have till second order get executed. By using the spreads order in the spread order window, both the above mentioned issues get fixed.

6.2.6 Order Matching Rule

Exchanges follow continuous order matching based on price-time priority. An order may match partially with another order resulting in multiple trades. The best price orders are matched first. If more than one order arrives at the same price, they are arranged in ascending time order. Best buy price is the highest buy price amongst all buy orders and similarly best sell price is the lowest price of all sell orders. This is because the system views all buy orders available from the point of view of a seller and all sell orders from the point of view of the buyers in the market. So, of all buy orders available in the market at any point of time, a seller would obviously like to sell at the highest possible buy price that is offered. Hence, the best buy order is the order with the highest price and the best sell order is the order with the lowest price. Orders lying unmatched in the system are 'passive' orders and Orders that come in to match the existing orders are called 'active' orders. Orders are always matched at the passive order price. Matching of active order may be against single order or multiple passive orders. Quantity is not factor for matching.

Let us take an example here to better understand this. A sample of the order book is given below for understanding:

Buy Quantity/Lot	Buy Price	Sell Price	Sell quantity
50	121.20	121.50	50
100	121.10	121.80	200
25	120.90	122.10	3000
500	120.80	122.20	1000
5000	120.00	122.60	200

These quotes given in the table above are visible to clients. Now if a buy market order comes with an order quantity of 50 it gets executed for a price of Rs. 121.50 and the order book entries on the sell side moves up by one notch i.e., the Rs. 121.80 order comes to top. On the other hand, if a limit order with a sell price of Rs. 121.20 for a quantity of 500 comes, 50 shares get executed at price of Rs. 121.20 and the order for remaining 450 shares stay at the top on the sell side at price of Rs. 121.20. All orders come as active orders into the order book. If they get a match, they will be executed immediately; else they will enter the order book according to their price and time as passive orders.
Let us take another example: -

Buy Qty./Lot	Buy Price	Sell Price	Sell Qty./Lot
1,606	807.55	807.60	100
13	807.50	807.75	119
383	807.45	807.80	184
78	807.40	807.85	42
1	807.35	807.90	86

Order is placed to buy 200 shares at Rs.807.65. In this current scenario, the incoming limit order will get matched with the best sell order in the book which is 100 shares @ Rs.807.60 and a trade will take place for 100 shares at Rs.807.60. It should be noted that the order is always matched with the passive order price, in this case as the sell order is the passive order, matching takes place at Rs.807.60. The balance buy order for 100 shares @ Rs.807.65 will sit in the order book on the buy side as the best buy order.

Revised order book snapshot as follows:

Buy Qty./Lot	Buy Price	Sell Price	Sell Qty./Lot
100	807.65	807.75	119
1,606	807.55	807.80	184
13	807.50	807.85	42
383	807.45	807.90	86
78	807.40	807.95	12

6.3 Order Management

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 PAN) and Proprietary / Client identifier.

6.3.1 Order Entry

A trading member can enter various types of orders depending upon his/her requirements. The order conditions are broadly classified into three categories: price related conditions, time-related conditions, and quantity related conditions. We will see about the order condition in following section. Trading members are allowed to enter order during market hours only. Following are some examples of order entry:

Contract Descriptor									
Type of Derivatives	**Underlying**	**Expiry Date**	**Buy / Sell**	**Mkt Lot**	**Price**	**Time Condition**	**Pro / Cli**	**UCC & PAN**	**CP Code**
Interest Rate Future	6.10% G-Sec 2031	281021	B	5	98.50	Day	Cli	A001 XXXX	-

Contract Descriptor											
Type of Derivative	**Underlying**	**P/C**	**Strike Price**	**Expiry Date**	**Buy / Sell**	**Mkt Lot/ Qty**	**Price**	**Time Cond.**	**Pro / Cli**	**UCC & PAN**	**CP Code**
Interest Rate Option	6.10% G-Sec 2031	Call	101.00	281021	B	5	0.1575	Day	Cli	A01 XXX	-

Once the order is entered and confirmed by the client/dealer at his trading terminal and verified by the broker software, the order is routed to the Exchange for its execution. The Exchange system allots a unique order number for all orders received in the system. This is given as order confirmation along with the time stamp to the broker. As soon as a trade is executed, the trade confirmation message will be automatically available on the trading terminal of broker.

6.3.2 Types of orders

Price, time and quantity are three major components of an order. A stock broker can enter various types of orders depending upon the requirement. These conditions are broadly classified into three categories: price related conditions, time-related conditions, and quantity related conditions.

A. 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. There are two variations on the market order—market order without protection and Market order with protection. The market order without protection means that the trades are executed at the best available price/s in the market at that point in time. The second type of market order i.e., market with protection order is a combination of market and limit order. It allows the market order to be executed till a specified level mentioned by trader. The risk of an order getting executed at any price is protected by using such order.

Example: Illustration of a typical market order

Order is placed to buy 100 lots of 6.10% GOI 2031 bond futures “at Market”. The order book snapshot looks like as below:

Buy Qty./Lot	Buy Price	Sell Price	Sell Qty./Lot
1,606	98.55	98.60	100
13	98.50	98.65	119
383	98.45	98.70	184
78	98.40	98.75	42
1	98.35	98.85	86

In this current scenario, the incoming buy market order will get matched with the best sell order in the book which is 100 lots @ Rs.98.60 and a trade will take place for 100 lot at Rs.98.60. If buy order is placed for 200 lots "at Market" then trade will take place for 100 lot at Rs.98.60 and 100 lot at Rs.98.65.

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. They of course can be changed any time before execution. Reaching these limits/targets is not always possible and sometimes the orders do not go through. Limit orders are very common for online traders.

Example: Illustration of a typical limit order

Order is placed to buy 200 lots of 6.10% GOI 2031 bond futures at Rs.98.60. The order book snapshot looks like as below:

Buy Qty./Lot	Buy Price	Sell Price	Sell Qty./Lot
1,606	98.55	98.60	100
13	98.50	98.75	119
383	98.45	98.80	184
78	98.40	98.85	42
1	98.35	98.90	86

In this current scenario, the incoming limit order will get matched with the best sell order in the book which is 100 lot @ Rs.98.60 and a trade will take place for 100 shares at Rs.98.60. The balance buy order for 100 shares @ Rs.98.60 will sit in the order book on the buy side as the best buy order. The revised order book snapshot after the trade match will look as follows:

Buy Qty./Lot	Buy Price	Sell Price	Sell Qty./lot
100	98.60	98.75	119
1,606	98.55	98.80	184
13	98.50	98.85	42
383	98.45	98.90	86
78	98.40	98.95	12

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.

In stop order, the client enters two prices: one is trigger price and the other is limit/market price. A stop order can best be explained with an example. Suppose a trader has a short

term (say, for a day), bullish view on a debt security, he may buy the bond future at say Rs.100 in the early hours of trading session. If the price moves upwards as per his expectation, he may sell the future, say at Rs.100.75 and close his position. The future price can also move downwards much against expectations of the trader. It may so happen that the trader may have limited risk appetite and does not want to incur loss of more than Rs.0.25 per bond. In such a scenario, trader can give stop loss sell order with trigger price of Rs.99.80 and limit price of Rs.99.75. When the stock price starts moving downwards, as soon as it hits price of Rs.99.80, the sell order of Rs.99.75 will automatically get triggered. Any further downward movement in price will not affect the trader as he has already limited his loss on the position. A buy order in the stop loss book gets triggered when the last traded price in the normal market reaches or exceeds the trigger price of the order.

A typical sell stop loss order example:

- Original transaction: Bought 400 lot of 6.10% GOI 2031 bond futures at Rs.100.
- If the price falls below the buy price, the investor will start clocking a loss.
- Investor may place a sell stop loss order at a trigger price of Rs.99.80. When the price of bond drops to Rs.99.80 or below, sell stop loss order will get triggered.
- Order is then placed in the market to sell 400 lots of 6.10% GOI 2031 bond futures.
- It can be triggered as a market order, or as a limit order
- If the investor had specified a limit price (which can be equal to or less than trigger price), for example in this case, Rs.99.75
- In the case of stop loss limit order, once triggered, the order will be placed in the market for sell 6.10% GOI 2031 bond futures 400 lots at Rs.99.75.
- It will match only if a corresponding buy order exists for Rs.99.75/- or better.
- If it is stop loss with market order, once triggered it will match with the best counter order available.

A typical buy stop loss order example:

- Original transaction: Sell 400 lots of 6.10% GOI 2031 bond futures at Rs.100.
- If the price goes above the sell price, the investor will start clocking a loss.
- Buy stop loss order is used to anticipate potential loss. Investor may place a buy stop loss order at a trigger price of say Rs.101.25.
- When bond price reaches Rs.101.25 or above, the buy stop loss order will get triggered.
- An order will be placed in the market to buy 400 lots of 6.10% GOI 2031 bond futures.
- It can be triggered as a market order, or as a limit order.
- If the investor had specified a limit price (which can be equal to or more than trigger price), for example in this case, the limit price could be Rs.101.25.
- In the case of stop loss limit order, when the stop loss order is triggered, the order will be placed in the market for buying 400 6.10% GOI 2031 bond futures lots at Rs.101.25/-. It will match only if a corresponding sell order exists for Rs.101.25/- or better.

- If it is stop loss with market order, once triggered it will match with the best counter order available.

It is also important to note that once the order is triggered, it will match only if the counter order is available in the order book.

The variations in the three orders require traders to be well aware of the options when trading. Studying the interest rate/security price movement and predicting the trend accurately is very important.

B. 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. Partial match is possible for the order, and the unmatched portion of the order is cancelled immediately.

Example: Illustration of a typical IOC order

Order is placed to buy 200 lots of 6.10% GOI 2031 bond futures at Rs.98.60 immediate or cancel. The order book snapshot looks like as below:

Buy Qty./Lot	Buy Price	Sell Price	Sell Qty./Lot
1,606	98.55	98.60	100
13	98.50	98.75	119
383	98.45	98.80	184
78	98.40	98.85	42
1	98.35	98.90	86

In this current scenario, the incoming limit order will get matched with the best sell order in the book which is 100 lots @ Rs.98.60 and a trade will take place for 100 lots at Rs.98.60. The balance buy order for 100 lots @ Rs.98.60 will be cancelled as it is an IOC order as there is no match for the remaining 100 lots.

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. The maximum number of days a GTC order can remain in the system is notified by the Exchange from time to time.

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. Each day/date counted is a calendar day and inclusive of holidays. The days/date counted are inclusive of the day/date on which the

order is placed. The maximum number of days a GTD order can remain in the system is notified by the Exchange from time to time.

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.
Note: Currently, GTC and GTD orders are not available on the system as per SEBI directives.

C. 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. For example, an order of 1000 lots with a disclosed quantity condition of 200 will mean that "200 lots" is displayed to the market at a time. After this is traded, another 200 lots are automatically released and so on till the full order is executed. The Exchange may set a minimum disclosed quantity criteria from time to time.
MF - Minimum Fill (MF) orders allow the Trading Member to specify the minimum quantity by which an order should be filled. For example, an order of 1000 lots with minimum fill 200 will require that each trade be for at least 200 lots. In other words, there will be a maximum of 5 trades of 200 each or a single trade of 1000. The Exchange may lay down norms of MF from time to time.

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.
Note: Currently, AON and MF orders are not available on the system as per SEBI directives.

Other conditions

- Pro: 'Pro' means that the orders are entered on the trading member's own account.
- Cli: 'Cli' means that the trading member enters the orders on behalf of a client.

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. Proprietary trading is allowed from more than one location is subject to certain conditions. Prior approval of Exchange is required to members for facility of 'proprietary-account' through trading terminals from more than one location and / or CTCL terminal. The Stock Exchange may, on case-to-case basis after due diligence,

consider extending the facility of allowing use of “pro-account” from more than one location.

With a view to increase the transparency in the dealings between the broker and the client, every broker shall disclose to his client whether he does client based business or proprietary trading as well. The broker shall disclose this information upfront to his new clients at the time of entering into the Know Your Client agreement.

A stock broker of an exchange cannot deal with the brokers of the same exchange either for proprietary trading or for trading on behalf of clients, except with the prior permission of the exchange. The Stock Exchanges while giving such permission, shall consider the reasons stated by the brokers for dealing with brokers of the same exchange and after carrying out due diligence allow such brokers to deal with only one stock broker of the same exchange. A stock broker of an exchange can deal with only one broker of another exchange for proprietary trading after intimating the names of such stock broker to his parent Stock Exchange.

6.3.3 Order Modification/ Order Cancellation

Sometimes in a moving market, orders need to be changed in terms of the price and quantity as per the client’s requirement. All the orders can be modified till the time they are not fully executed. Order modification is allowed only for certain parameters like price, quantity etc. Also, in certain scenarios order will loss time priority due to order modification. Due to some problems in the moving market or when one does not want to buy or sell contracts, then orders need to be cancelled. In this case only those orders can be cancelled during market hours which have not been fully or partially executed.

6.3.4 Trade execution

Execution of trade occurs when a buyer and seller reach an agreement pertaining to the terms and price of a trade and the order to buy or sell a security is completed after the same is matched on the Exchange platform. Once the order is executed it turns into trade and exchange sends notification of the trade to the broker along with trade number, trade time, traded quantity / lot, traded price, etc. The single order can have multiple trade number. The broker in turn communicates these trades to the client either immediately or at the end of the day. Official communication from broker is done to the client through contract note.

Trade modification is allowed for parameters like client code and custodian participant code. However, there are certain conditions and timings for such modifications as given below:

- Stock Exchanges may allow modifications of client codes of non-institutional trades only to rectify a genuine error in entry of client code at the time of placing/modifying the related order. The Stock Exchange shall conduct a special inspection of the trading member to ascertain whether the modifications of client codes are being

carried on as per the strict objective criteria set by the Stock Exchange. Shifting of trades to the error account of broker would not be treated as modification of client code, provided the trades in error account are subsequently liquidated in the market and not shifted to some other code.

- Further, brokers shall disclose the codes of accounts which are classified as 'error accounts' to the Stock Exchanges. Each broker should have a well-documented error policy approved by the management of the broker. Stock Exchanges shall periodically review the trades flowing to the error accounts of the brokers.
- The Stock Exchanges shall levy a penalty on trading members wherever applicable and credit the same to its Investor Protection Fund. Stock Exchanges may waive penalty for a client code modification where stock broker is able to produce evidence to the satisfaction of the stock exchange to establish that the modification was on account of a genuine error.
- Proprietary trades shall not be allowed to be modified as client trade and vice versa.

Modification between client codes of two entities which are of the institutional category will be allowed only if the modification from both client codes is from different schemes / sub-accounts of / managed by the same Institution. Such modifications shall not be subject to penalty.

Any modification between two client codes which are of institutional category and do not satisfy the above criteria, i.e., modification between two unrelated institutional clients will be subject to penalty.

Members can modify the Custodial Participant Code (CP Code) on the trade day during trading hours as per the time stipulated by Stock Exchanges and Clearing Corporation.

Trade annulment[28]:

Trading members are allowed to provide trade annulment request on trading system. The request should be submitted within 30 minutes from trade execution. However, stock exchange may consider requests received after 30 minutes, but no longer than 60 minutes, only in exceptional cases and after examining and recording reasons for such consideration. Trade annulment request should satisfy certain condition for further processing. A fee based on value of trade(s) for which annulment is requested, subject to minimum and maximum fee shall be charged as annulment application fee for accepting the request. Examination of trade(s) for annulment can also be taken suo moto by stock exchange.

As per SEBI guideline on Trade Annulment, Stock exchanges shall charge an application fee equal to 5% of the value of trade(s) for accepting an annulment request from a stock

[28] Circular No. CIR/MRD/DP/15/2015 dated July 16, 2015

broker, subject to minimum fee of ₹ 1 lakh and maximum fee of ₹10 lakhs. Stock exchanges may suitably increase the upper limit of the application fee as deemed necessary to discourage frequent or frivolous requests for annulment. The amount realised as application fee shall be credited to the "Investor Protection Fund" of the concerned stock exchange.

6.4 Risk Management and Order Routing

Any transaction or behaviour, whether it is buying, selling or instigating to wilfully produce an abnormal effect on prices and/or volumes, goes against the fundamental objective of protecting the interest of the investors of the securities markets. Here the risk management system plays a crucial role. An efficient risk management system is integral to an efficient settlement system.

Obligation to settle the trades lies with the broker, if any client makes any trade default, then the same has to be made good by the broker to the clearing corporation. When orders are accepted and sent to exchange these orders go through various risk management checks for clients. The broker system should have an on-line risk management capability for all orders placed on the Exchange platform. Further, brokers should have various trading limits (like Order Quantity and Value Limits, User / Branch Order Limit, Order Price limit, etc.) on the system and only such orders which are within the parameters specified by the risk management system be allowed to be pushed into exchange trading platform.

Margin is an amount that clearing corporations levy on the brokers for maintaining positions on the exchange. The amount of margin levied is proportional to the exposure and risk the broker is carrying. Since positions may belong to a broker's clients, it is the broker's responsibility to collect the margin upfront from clients and allow trading to client based on the collateral provided by the client. The broker system should have capability to generate reports relating to margin requirements, payments, and delivery obligations. The goal of a broking firm's risk management system is to measure and manage its own and its client's exposure to various risks identified as central to its operations. Broker system should assess the risk of the client as soon as the order comes in, further broker can have system-based control on the trading limits of clients, and exposures taken by clients.

Brokers are required to set pre-defined limits on the exposure and turnover of each client. SEBI/Stock Exchanges have specified various systems / risk management requirements based on the type of broker. For example, Brokers who trade through exchange provided terminals; Brokers who trade through CTCL, IBT, STWT, SOR; and Brokers who use Algorithmic Trading facility. For each risk category, the broking firm must employ procedures to measure and manage firm-level exposure. These are:

Establish Standards and Reports:
Every broker has a set of standards which they adhere to, and these are the standards against which a client is measured. Policies and procedures to accomplish the guidance should include designated lines of authority in the risk management and control process and responsibility for compliance with risk exposure policies, effective internal accounting controls, and internal and external audit. Firms should have in place a risk management and control reporting and review process. Assessment of the effectiveness of established strategies, policies and procedures should be performed regularly.

Impose Position Limits:
A key element of financial risk management is deciding which risk to bear and to what degree. A broker firm needs to impose limits to cover exposures, and overall position concentrations relative to systematic risks. SEBI and exchanges prescribe from time to time Open position limit for various categories of products in the Equity Derivatives, Currency Derivative, Interest Rate Derivatives and Commodity Derivative segments.

Set Investment Guidelines and Strategies:
A broking firm should outline investment guidelines and strategies for risk taking in the immediate future in terms of commitments to a particular market area, extent of asset-liability mismatching, or the need to hedge against systematic risk at a particular time. Risk management involves determining what risks a firm's financial activities generate and avoiding unprofitable risk positions.

Systems for Reporting Compliance with Established Policies and Procedures
The Broking Firms should have in place a risk management and control reporting and review process. This process should include a review mechanism for reporting compliance with established policies and procedures and addressing exceptions

Assessment of the Effectiveness of the Strategies, Policies and Procedures
Assessment of the effectiveness of established strategies, policies and procedures should be performed regularly. The evaluation should consider the results of established policies, changes in business activities and changes in markets. Material changes to methodologies, models, and assumptions of risk management and control policies should be reviewed by the governing body. Policies and procedures should require that the risk management and control functions be involved in the review of new business products and activities.

6.4.1 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. For the stock broker, operations risks are essentially risk arising on account of handling of client assets, regulatory non-compliance, trading error, non-payment for buying or selling a scrip, non-delivery of scrip(s), denial of matched order by clients, sudden closure of banks where funds are

deposited etc. Operational risk encompasses the risk of loss due to the breakdown in controls within the firm including, but not limited to, unidentified limit excesses, unauthorized trading, fraud in trading or in back office functions including inadequate books and records and a lack of basic internal accounting controls, inexperienced personnel, and unstable and easily accessed computer systems.

Market risk refers to the possibility of incurring large losses from adverse changes in financial asset prices such as stock prices. For the stock broker, market risks are essentially risk arising on account of concentration of client collateral in stocks/sectors, brokers own investment in stocks/sectors etc. This risk entails the erosion of value of marketable securities and assets, due to factors beyond an enterprise's control. Market risk is usually affected by economic developments and political destabilization such as a rising fiscal gap, national debt, terrorism, energy price shocks, increase in interest rates, all resulting in a drop in equity prices. Market risk can also include the risks associated with the cost of borrowing securities, dividend risk, and correlation risk.

Credit risk is the risk of default on a debt that may arise from a borrower failing to make required payments. The credit risk for broker can arise on account of Loans to Group Companies/ Related Parties, debit balance of clients, funding of clients, short collection of margins, Non-confirmation of DVP trade by custodian etc. Credit risk can be minimized by risk management and controls and procedures that require counterparties to maintain adequate collateral, make margin payments, and have contractual provisions for netting.

Legal risk arises from the possibility that an entity may not be able to enforce a contract against another party. Legal risk involves the potential illegality of the contract, as well as the possibility that the other party entered into the contract without proper authority.

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. Systemic risk encompasses the risk that failure in one firm or one segment of the market would trigger failure in segments of or throughout the entire financial markets.

Technology risk which includes technical glitches and cyber-attacks.

A stock broking firm must identify factors that can trigger operational, market, legal, systemic and credit risk. It needs to establish procedures so that risk management begins at the point nearest to the assumption of risks. This means adapting trade-entry procedures, customer documentation, client engagement methods, trading limits, and other normal activities to maintain management control, generate consistent data, and eliminate needless exposure to risk.

With regards to "Monitoring of unauthenticated news circulated by SEBI Registered Market Intermediaries through various modes of communication" SEBI is directed following to SEBI Registered Market Intermediaries.

- Proper internal code of conduct and controls should be put in place.
- Employees/temporary staff/voluntary workers etc. employed/working in the offices of market intermediaries do not encourage or circulate rumours or unverified information obtained from client, industry, any trade or any other sources without verification.
- Access to social media platforms/ instant messaging services/ VoIP /Blogs/Chat forums/websites/e-mail or any such medium should either be subject to controlled supervision or access should not be allowed.
- Logs for any usage of such social media platforms/ instant messaging services/ VoIP /Blogs/Chat forums/websites/e-mail or any such medium shall be treated as records and the same should be maintained as specified by the respective regulations which govern the concerned intermediary.
- Employees should be directed that any market related news received by them either in their official mail/personal mail/blog or in any other manner, should be forwarded only after the same has been seen and approved by the Compliance Officer of the concerned Intermediaries. If an employee fails to do so, he/she shall be deemed to have violated the various provisions contained in SEBI Act and the Rules/Regulations framed thereunder and shall be liable for action. The Compliance Officer shall also be held liable for breach of duty in this regard.

SEBI regulated market intermediaries also required to report to Stock Exchanges regarding violations under SEBI (Prohibition of Insider Trading) Regulations, 2015 relating to the Code of Conduct (CoC).

SEBI has introduced Chapter IVA in SEBI (Stock Brokers) Regulations, 1992 Institutional Mechanism for Prevention and Detection of Fraud or Market Abuse[29]. Accordingly, it has been decided that stock brokers shall comply with the following obligations / mechanisms as laid down in Chapter IVA of the Broker Regulations:

- Systems for surveillance of trading activities and internal controls
- Obligations of the stock-broker and its employees
- Escalation and reporting mechanisms
- Whistle Blower Policy

6.4.2 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. Certain checks

[29] https://www.sebi.gov.in/legal/circulars/jul-2024/measures-to-instil-confidence-in-securities-market-brokers-institutional-mechanism-for-prevention-and-detection-of-fraud-or-market-abuse_84588.html

are monitored by trading member and certain checks are monitored by Exchange trading system. Some of the pre-order and pre trade checks are given below. Pre-trade risk control helps to prevent aberrant orders or uncontrolled trades.

With a view to facilitating informed decision making by the investors trading in derivatives segment, SEBI has introduced 'Risk disclosures' with respect to trading in equity Futures & Options (F&O) segment. Accordingly, all stock brokers mandated to display the 'Risk disclosures' given by SEBI on their websites and to all their clients in the manner as specified below:

- Upon login into their trading accounts with brokers, the clients may be prompted to read the 'Risk disclosures' (which may appear as a pop-up window upon login) and shall be allowed to proceed ahead only after acknowledging the same.
- The 'Risk disclosures' shall be displayed prominently, covering at least 50 percent area of the screen. SEBI mandated stock-broker, upon login by client in trading accounts with brokers, the clients may be prompted to read the 'Risk disclosures' related to equity derivatives (which may appear as a pop-up window upon login) and shall be allowed to proceed ahead only after acknowledging the same. The 'Risk disclosures' shall be displayed prominently, covering at least 50 percent area of the screen.

Pre-order checks

- Price range check: Orders are allowed to enter within specific price range.
- Quantity Freeze: Single order quantity / lot cannot exceed the limit specified by Exchanges.
- Single order quantity / value limit: This limit is specified by trading member for its dealer.
- User order value limits: This limit can be set up by trading member for its dealer / branch.
- Cumulative open order value checks: This limit can be set up by trading member for its dealer / branch / trading member level
- UCC/PAN check: Trading member can put this check to ensure that order is not entered for unregistered client.

Pre-trade checks

- Trade Execution Range: Orders shall be matched, and trades shall take place only if the trade price is within the trade execution range based on the reference price of the contract.
- Self-Trade Check: Pro / Client orders entered by same/different members are resulting in self-trade due to same PAN or CP code, as the case may be, on the active and passive side, the same shall result in active or passive order will get cancelled due to self-trade checks.
- Market price protection: market with protection order is a combination of market and limit order. It allows the market order to be executed till a specified level mentioned

by trader. The risk of an order getting executed at any price is protected by using such order.

- Kill Switch: This will facilitate member to cancel all outstanding order with one single command
- Cancel on Logout (COL): If member / user entered order with COL, all outstanding order of the user will get cancelled once user get logout from the TWS.

In recent times, with increasing dependence on technology in securities market, there is a rise in instances of glitches in trading members' systems, some of which lead to disruption of trading services and investor complaints. To address the issue, SEBI has taken various measures. Some of the recent measures are given below:

Introduction of Investor Risk Reduction Access (IRRA) platform in case of disruption of trading services provided by the Trading Member[30]:

Salient features of the SEBI circular are given below. For additional information participant may refer to the SEBI circular.

- A joint platform to provide Investor Risk Reduction Access (IRRA) service shall be developed by the exchanges to provide the investors an opportunity to square off/close the open positions and /or cancel pending orders in case of disruption of trading services provided by the Trading Member.
- The IRRA service shall support multiple segments across multiple exchanges.
- TMs, upon facing technical glitches which lead to disruption of trading services, can request for enablement of the IRRA service as per the procedures specified by the stock exchanges from time to time and IRRA shall be enabled on receipt of such requests.
- Once the service is enabled, all the investors of the TM shall be informed by the exchange of the availability of the service through email/SMS and a public notice on exchanges' website. TMs shall also communicate the same by displaying on their website.
- Investor can us IRRA service to square off/close the open position and/or cancel the pending order. The IRRA service shall not permit any action that increases the risk of the investor.
- Further, IRRA service shall also provide the TM with access to an Admin Terminal, through which the TM can monitor the actions of investors and also carry out the actions as mentioned above, on instructions of investors.

Stock Exchanges have introduced the IRRA platform for their trading members.

[30] https://www.sebi.gov.in/legal/circulars/dec-2022/introduction-of-investor-risk-reduction-access-irra-platform-in-case-of-disruption-of-trading-services-provided-by-the-trading-member-tm-_66785.html

Framework to address the 'technical glitches' in Stock Brokers' Electronic Trading Systems[31].

Salient features of the SEBI circular are given below. For additional information participant may refer to the SEBI circular.

- Stock brokers shall inform about the technical glitch to the stock exchanges immediately but not later than 1 hour from the time of occurrence of the glitch.
- Stock brokers shall submit a Preliminary Incident Report to the Exchange within T+1 day of the incident (T being the date of the incident). The report shall include the date and time of the incident, the details of the incident, effect of the incident and the immediate action taken to rectify the problem.
- Stock brokers shall submit a Root Cause Analysis (RCA) Report (as per format specified by SEBI) of the technical glitch to stock exchange, within 14 days from the date of the incident.
- RCA report submitted by the stock brokers shall, inter-alia, include time of incident, cause of the technical glitch (including root cause from vendor(s), if applicable), duration, chronology of events, impact analysis and details of corrective/ preventive measures taken (or to be taken), restoration of operations etc.
- Increasing number of investors may create additional burden on the trading system of the stock broker and hence, adequate capacity planning is prerequisite for stock brokers to provide continuity of services to their clients.
- In order to streamline the reporting process of technical glitches across MIIs and creation of centralized repository of technical glitches, SEBI has developed a web-based portal, i.e. Integrated SEBI Portal for Technical Glitches (iSPOT), for submission of preliminary and final RCA reports of technical glitches by the MIIs.
  Proactively and independently monitoring technical glitches shall be one of the approaches in mitigating the impact of such glitches. In this context, the stock exchange has advised to build API based Logging and Monitoring Mechanism (LAMA) to be operated between stock exchanges and specified stock brokers' trading systems. Under this mechanism, specified stock brokers shall monitor key systems & functional parameters to ensure that their trading systems function in a smooth manner. Candidates can refer SEBI circular dated January 09, 2023, regarding Standard Operating Procedure for handling of Stock Exchange Outage and extension of trading hours thereof.

Business Continuity for Interoperable Segments of Stock Exchanges[32]

The following has been decided by SEBI for the interoperable segments of stock exchanges (i.e. Cash Market/ Equity Derivatives/ Currency Derivatives/ Interest Rate Derivatives etc.)

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[31] https://www.sebi.gov.in/legal/circulars/nov-2022/framework-to-address-the-technical-glitches-in-stock-brokers-electronic-trading-systems_65466.html

[32] https://www.sebi.gov.in/legal/circulars/nov-2024/business-continuity-for-interoperable-segments-of-stock-exchanges_89032.html

i. **Common scrips, derivatives on single stocks or correlated indices, currency derivatives segment and interest rate derivatives**: If identical or correlated trading products are available on another trading venue, then participants can hedge their open positions by taking offsetting positions in identical or correlated indices on other exchange. Further, as these segments are interoperable, taking offsetting positions in other trading venue would net off such open positions for end clients and release the margin. Hence, no separate treatment is required for such category of products.

ii. **Scrips exclusively listed on an exchange**: To ensure continuity, exchanges may create reserve contracts for scrips (i.e. exclusively listed scrips on other exchange) and single stock derivatives not traded on their exchange (and available on other exchange), to be invoked at the time of outage on the other exchange.

iii. **Index derivatives products not having correlated index derivatives products on another exchange**: Exchange which does not have a highly correlated index derivatives product with one available on other exchange may consider creating such an index and introducing derivatives contracts on it, in line with extant Regulatory provisions. The aforesaid would provide an avenue to hedge positions in index derivatives products of an exchange that suffered an outage.

iv. **Intimation to SEBI and Alternative Trading Venue**: The affected exchange should comply with extant Regulatory requirements with regard to handling of technical glitch / outage and intimate about the invocation of the instant business continuity mechanism to the alternative trading venue and SEBI within 75 minutes of occurrence of impact. The alternative trading venue would invoke the business continuity plan as per the Standard Operating Procedure (SOP) within 15 minutes from such intimation.

NSE would act as an alternative trading venue for BSE and vice-a-versa. Both exchanges would prepare a joint SOP that would include plan to be invoked at the time of outage on one exchange along with flow of activity involving the affected exchange and its alternative trading venue and roles/responsibility of each of them.

Cyber Security & Cyber Resilience Framework (CSCRF) for Stock Brokers / Depository Participants[33]

Rapid technological developments in securities market highlighted the need for maintaining a robust cyber security and cyber resilience framework to protect the integrity of data and guard against breaches of privacy. Since stock brokers and depository participants perform significant functions in providing services to holders of securities, these entities should have robust cyber security and cyber resilience framework. This shall provide for essential facilities and perform systemically critical functions relating to

[33] SEBI Circular No.: SEBI/HO/ITD-1/ITD_CSC_EXT/P/CIR/2024/113 dated August 20, 2024 on Cybersecurity and Cyber Resilience Framework (CSCRF) for SEBI Regulated Entities (REs).

securities market. Cyber security framework includes measures, tools and processes that are intended to prevent cyber-attacks and improve cyber resilience.

In order to strengthen the cybersecurity measures in Indian securities market, and to ensure adequate cyber resiliency against cybersecurity incidents/ attacks, Cybersecurity and Cyber Resilience Framework (CSCRF) for SEBI Regulated Entities has been formulated recently by SEBI (SEBI circular dated August 20, 2024) in consultation with the stakeholders. The CSCRF aims to provide standards and guidelines for strengthening cyber resilience and maintaining robust cybersecurity of SEBI REs. This framework shall supersede existing SEBI cybersecurity circulars/ guidelines/ advisories/ letters (list of such superseded circulars/ guidelines/ advisories/ letters are given as part of the framework) that the CSCRF shall come into effect, in phased manner, starting from January 1, 2025 onwards in phase manner. The key objective of CSCRF is to address evolving cyber threats, to align with the industry standards, to encourage efficient audits, and to ensure compliance by SEBI Res. As per the CSCRF, the following REs are constituted as the Market Infrastructure Institutions (MIIs):

a) Stock Exchanges
b) Depositories
c) Clearing Corporations
d) KYC Registration Agencies (KRAs)
e) Qualified Registrars and Transfer Agents (QRTAs)

Cyber Resilience is an organization's ability to prepare and respond to a cyber-attack and to continue operation during, and recover from, a cyber-attack. The Cyber Security and Cyber Resilience Framework is based on 5 cyber resiliency goals:

i. **Anticipate**: Maintain a state of informed preparedness from adversary attacks.

ii. **Withstand**: Continue essential business functions at times of adversary attacks.

iii. **Contain**: In the event of cyber-attacks, localise containment of crisis and isolate trusted functions from untrusted ones to continue business operations.

iv. **Recover**: Restore business functions to the maximum extent, subsequent to adversary attacks.

v. **Evolve**: To change business functions and its supporting cyber capabilities to minimize adverse impacts of adversary attacks (actual or predicted).

CSCRF mandates that all REs are required to establish appropriate security monitoring mechanisms through Security Operation Centre (SOC). The onboarding of SOC can be done through RE's own/group SOC or Market SOC or any other third-party managed SOC for continuous monitoring of security events and timely detection of anomalous activities. As compliance with the cybersecurity guidelines may be onerous for smaller REs due to the lack of knowledge and expertise in cybersecurity and the cost factor involved in setting up own SOC. Therefore, CSCRF mandates NSE and BSE to set up Market SOC(M-SOC) with the objective of providing cybersecurity solutions to such categories of REs.

Safeguards to avoid trading disruption in case of failure of software vendor

Software vendors who provide software to market participants and market infrastructure institutions for the purpose of trading, risk management, clearing and settlement play a crucial role in the securities market. Any inability on the part of such software vendors to provide software or related services in timely and continuous manner may create a situation of stress in the securities market.

It was recommended that adequate mechanism/ procedure should be in place to ensure smooth transition by stock broker(s) to another software vendor in case of inability of the existing software vendor to provide software and related services in timely and continuous manner. Stock brokers have advised to take the following measures:

a) Explore the possibility of establishing a 'software escrow arrangement' with existing software vendors. In case of large stock brokers, reducing dependence on a single software vendor for trading and risk management systems, by engaging more than one software vendor may be considered.

Framework for Adoption of Cloud Services by SEBI Regulated Entities (REs)

SEBI vide its circular SEBI/HO/ITD/ITD_VAPT/P/CIR/2023/033 dated March 06, 2023, provided “Framework for Adoption of Cloud Services by SEBI Regulated Entities (REs)”. The major purpose of this framework is to highlight the key risks, and mandatory control measures which REs need to put in place before adopting cloud computing. The document also sets out the regulatory and legal compliances by REs if they adopt such solutions. This cloud framework is applicable for adoption of public cloud and community cloud. Consequently, REs are permitted to deploy public cloud and community cloud models, subject to the conditions specified in above circular. A private cloud shall be considered as an on-premise deployment model and consequently, private cloud deployments shall be governed by SEBI circulars (for example cyber security circular, outsourcing circular, BCP-DR, etc.), guidelines, advisories, etc. issued from time to time. Therefore, private cloud deployments (by REs) are permitted, however, such deployments may not be governed by this cloud framework. A hybrid cloud is a combination of two or more out of public cloud, community cloud and private cloud. Therefore, this cloud framework as well as the relevant SEBI circulars/ guidelines/ advisories shall be applicable for hybrid cloud deployments. In view of the above, hybrid cloud deployment is permitted, subject to the conditions specified in the above SEBI circular Deployment of any other cloud model is prohibited unless explicitly permitted under this framework. SEBI may allow deployment of other models after due consultations. The same may be specified by SEBI from time to time.

The cloud framework is a principle-based framework which covers Governance, Risk and Compliance (GRC), selection of Cloud Service Providers (CSPs), data ownership and data localization, due-diligence by REs, security controls, legal and regulatory obligations,

DR & BCP, and vendor lock-in risk. The principles are broadly stated guidelines to set the standards by which RE must comply with while adopting cloud services.

6.4.3 Surveillance

The exchanges as first-level regulators have an online surveillance capability that monitors positions, prices, and volumes in real time so as to deter market manipulation. The surveillance systems of the exchanges are designed keeping in view all the relevant aspects, including the following:

i. The alerts in the online surveillance system automatically generate material aberrations from normal activity.

ii. The surveillance systems and processes are able to:

- Monitor open interest, cost of carry, and volatility.
- Monitor closing prices.
- Capture and process client level details.
- Develop databases of trading activity by brokers as well as clients.
- Generate trading pattern by a broker over a period of time or by a client / group of clients over a period of time.

iii. The information and feedback received from member inspections are vital inputs for effective surveillance. For this, member inspections are taken up in a rational manner keeping in view the level of trading activity, client profile, number and nature of complaints received against the member, history of risk management related defaults and regulatory violations, etc. Information obtained through member inspections is made available to the monitoring/ surveillance departments of Exchanges.

iv. The Exchange calls for information from members in a standard form, and preferably in electronic form, to facilitate faster analysis as well as building up of databases.

6.5 Price Limit Circuit Filter

With the view to ensure orderly trading and market integrity, SEBI prescribes stock exchanges to implement a mechanism of price bands so as to prevent acceptance of orders placed beyond the price limits set by the stock exchanges. Following price bands/operating ranges are applicable to interest rate futures and options contract.

Contract	Price Band
GOI Bond Futures	+/-3 % of the base price of the contract. Whenever a trade in any contract is executed at the highest/lowest price of the band, Exchange may expand the price band for that contract by 0.5% in that direction after 30 minutes after taking into account market trend. Price band may be relaxed only 2 times during the day. Hence price can move +/- 4% of the base price for a day.

Contract	Price Band
91 Day T-Bills Futures	Operating range of +/-1 % of the base price of the contract.
Overnight MIBOR Futures	Operating range of +/-5 % of the base rate of the contract.
Corporate Bond Index Futures	Initial price band at 5% of the previous closing price or base price thus preventing acceptance of orders for execution that are placed beyond the set band. Whenever a trade in any contract is executed at the highest or lowest price of the band, stock exchanges may expand the price band for that contract by 0.5%in that direction after 30 minutes after taking into account market trend. However, no more than 2 expansions in the price band shall be allowed within a day.

In case of GOI bond option, the price operating range shall be based on the delta of the options contract and calculated using the previous close price of the underlying and volatility. The price band so computed shall be subject to a minimum operating range which would be applicable for all contracts. The bands shall be computed for each options contract on a daily basis and shall be applicable from the next trading day. The operating range may be flexed during the day in case the options traded price crosses certain percentage of the set range.

6.6 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:

a. **Statutory levies:** These are charges levied by Central/ State governments such as Goods and Service Tax, Security Transaction Tax (STT), Stamp Duty, etc. and may be recovered from client only at actuals paid / payable. **Currently, STT is not applicable for ETIRD transactions.**

b. **Regulatory levies/charges:** These are charges levied by SEBI / Exchanges / Clearing Corporations such as SEBI turnover fees, Exchange transaction charges, etc. If such charges are separately recovered from client, they may be specified in contract notes or may be given under the head “Other levies, if any”. The above charges may be recovered from client only at actuals paid/ payable.

c. **Brokerage** can be charged as may be mutually agreed between member and client subject to maximum permissible by the Exchange and brokerage rates should be mentioned in a tariff sheet.

Trading member can charge brokerage/commission to its client. The trading member firms have elaborate commission module (brokerage) to attract and retain clients. Given below are the rules for charging brokerage.

Brokerage rule for Derivatives segment are:

- In case of futures, the maximum brokerage chargeable by a trading member in relation to trades executed on the Exchange shall be 2.5% of the contract value exclusive of statutory levies.
- Brokerage on options contracts shall not exceed 2.5% of the premium amount or Rs.100 per lot whichever is higher.
- There is no minimum brokerage requirement specified.

Trading member can be a full service broker, discount broker or an online broker. Commission charged can be different for different types of brokers.

- Full service broker charges higher commission
- Discount brokers charge a much lower commission
- Online brokers cater to niche segment of retail clients.
    - Commission charged is lesser than what would be charged for a client placing orders through a broker.
- Brokers also use multiple commission schemes such as
    - Volume based commission
    - Slab wise commission or
    - Scrip wise commission.

6.6.1 SEBI Turnover Fees:

Every stock broker / clearing member / self-clearing member shall pay to the SEBI a fee in respect of the securities transactions including off-market transactions undertaken by them, at the rates specified by SEBI from time to time. Currently for Interest Rate Derivatives the SEBI turnover fees is Rs. 5 per crore of turnover[34]. A clearing member / self-clearing member shall pay a fee of Rs. 50000/- per year till the registration is in force.

6.6.2 Stamp Duty:

In order to facilitate ease of doing business and to bring in uniformity of the stamp duty on securities across States and thereby build a pan-India securities market, the Central Government, through requisite amendments in the Indian Stamp Act, 1899 and Rules made thereunder, has created the legal and institutional mechanism to enable states to collect stamp duty on securities market instruments at one place by one agency (through Stock Exchange or Clearing Corporation authorized by it or by the Depository) on one Instrument. A mechanism for appropriately sharing the stamp duty with relevant State

[34] The expression 'turnover' shall include the value of the trades executed by the stock broker on the concerned segment of the recognized stock exchange and of the trades settled on the expiration of the contracts. In case of options contracts, 'turnover' shall be computed on the basis of premium traded for the option contracts and in case where the option is exercised or assigned, it shall be additionally computed on the basis of notional value of option contracts exercised or assigned.

Governments has also been developed which is based on the state of domicile of the buyer. Exchanges / clearing corporation will collect the stamp duty from member. Members have to collect the stamp duty from their clients and remit to Exchange/Clearing Corporation.

Type of Security	**Applicable Stamp Duty Rate**	**Applicable on**
Interest Rate Derivatives	0.0001%	Buyer

Stamp Duty is collected on transactions for both futures and option contracts executed on stock exchanges. For the purpose of stamp duty, each futures trade shall be valued at the actual traded price and option trade shall be valued at premium.

Sample Questions

1. A client can place order in exchange traded interest rate derivatives through _____.
    a. Phone
    b. Internet
    c. Direct Market Access
    d. **All of the above**

2. A Buy or a Sell order(s) which is/are lying unmatched in the order book are known as _____.
    a. Active Orders
    b. **Passive Orders**
    c. Best Orders
    d. None of the above

3. A _____ order is classified as price related condition.
    a. **Market**
    b. Day
    c. IOC
    d. None of the above

4. Due to denial of matched orders by client/s, which type of risk arises?
    a. **Operational**
    b. Market
    c. Regulatory
    d. None of the above

5. If the base rate of Overnight MIBOR futures is 5, then its operating range will be _____.
    a. 5.05 & 4.95
    b. 5.10 & 4.90
    c. **5.25 & 4.75**
    d. 5.50 & 4.50

CHAPTER 7: CLEARING, SETTLEMENT AND RISK MANAGEMENT IN EXCHANGE TRADED INTEREST RATE DERIVATIVES

LEARNING OBJECTIVES:

After studying this chapter, you should know about following:

- Clearing and Settlement Mechanism and Entities Involved
- Interoperability among Clearing Corporation
- Determination of Settlement Obligations, Securities and Funds Settlement
- Risk Management of Clearing Corporation
- Regulatory Guideline on Position Limit and Settlement Guarantee Fund

Introduction

Clearing Corporation registered with SEBI is responsible for clearing and settlement of all trades executed in Exchange Traded Interest Rate Derivatives. Clearing Corporation acts as a legal counterparty to all trades in Currency Derivatives Segment (where ETIRD trades get executed) of the Exchange and also guarantees their financial settlement. The Clearing and Settlement process comprises of three main activities, viz., Clearing, Settlement and Risk Management. Clearing and settlement activities are undertaken by Clearing Corporation with the help of Clearing Members and Clearing Banks.

7.1 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[35] clearing through them. A trading member's open position is arrived at by summing up his proprietary and client's open positions. All derivatives contracts of interest rate futures and interest rate option are either cash settled or physically settled. The settlement amount for a clearing member is netted across all their TMs/Clients with respect to their obligations on mark-to-market settlement, premium settlement, and final settlement.

Clearing is the process of determination of obligations, after which the obligations are discharged by settlement. A multilateral netting procedure is adopted to determine the net settlement obligations (delivery/receipt positions) of the clearing members. Accordingly, a clearing member would have either pay-in or pay-out obligations for funds and securities separately. Settlement is a two-way process which involves transfer of funds and securities on the settlement date.

[35] Custodial participants (CP) are those clients who are eligible for trading through multiple trading members and clearing and settling deals through single clearing member

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.

The daily & final settlement of Exchange Traded Interest Rate Derivatives (ETIRD) trades is done on T+1 working day basis except for final settlement of interest rate derivatives contracts which are settled by physical delivery[36]. The funds pay-in and pay-out of daily mark to market settlement, final settlement of futures contracts which are cash settled, premium settlement and the final exercise settlements of options contracts which are cash settled are typically effected before start of market hours on the next day. The Clearing Corporations announces the settlement schedule for various segments/products on a periodic basis.

7.2 List of Entities in Clearing and Settlement of ETIRD

In this section we will discuss about few important entities of clearing and settlement and their role.

7.2.1 Clearing Corporation

Securities Contract (Regulation) (Stock Exchange and Clearing Corporations) Regulations 2018, defines Clearing Corporation as an entity that is established to undertake the activity of clearing and settlement of trades in securities or other instruments or products that are dealt with or traded on a recognized stock exchange and includes a clearing house and a limited purpose clearing corporation. A Clearing Corporation performs three main functions, namely: clearing and settlement of all transactions executed in the stock market (i.e., completes the process of receiving and delivering shares/funds to the buyers and sellers in the market) and carrying out risk management. The Clearing Corporation acts as a central counterparty i.e., it provides financial guarantees for all transactions executed on the Exchange. It acts as a legal counterparty to all trades through the process called novation[37]. Thus, Clearing Corporation becomes the buyer to every seller and seller to every buyer. If there is a default in this scenario, Clearing Corporation being counter party, is responsible for ensuring the settlement, thus managing risk and guaranteeing settlement to both the parties.

[36] Exchanges are allowed to introduce IRD contract with physical settlement. However, currently no ETIRD contract is available with physical settlement

[37] As per the definition given in the SEBI Securities Contracts (Regulation) (Stock Exchanges and Clearing Corporations) Regulations, 2018 "novation" means the act of a clearing corporation interposing itself between both parties of every trade, being the legal counterparty to both.

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.

As a central counterparty, the clearing corporation:

- Participates as counterparty in every transaction, which is commonly referred to as a 'counterparty undertaking'.
- Monitors the market and market participants.
- Provides structured procedures, as well as resources for dispute resolution. Buyers and sellers are not forced to take legal action against one another, as the clearing corporation offers independent legal enforcement of contracts.
- Reduces the number of payments due to netting and handles all payments not relating to deliveries on behalf of members.
- Provides possibilities to net deliveries of underlying stocks on a member level compared with netting of payments, which are always netted.
- Provides secure and standardized transaction processing.
- Provides less risk to investors trading on the stock exchanges, as the clearing corporation assumes the role of counterparty agency.
- Calculates and controls the margining mechanism

Currently NSE Clearing Ltd. (NCL) and Indian Clearing Corporation Ltd. (ICCL) act as clearing corporation for settlement of trades in Exchange Traded Interest Rate Derivatives Contracts.

7.2.2 Clearing Members

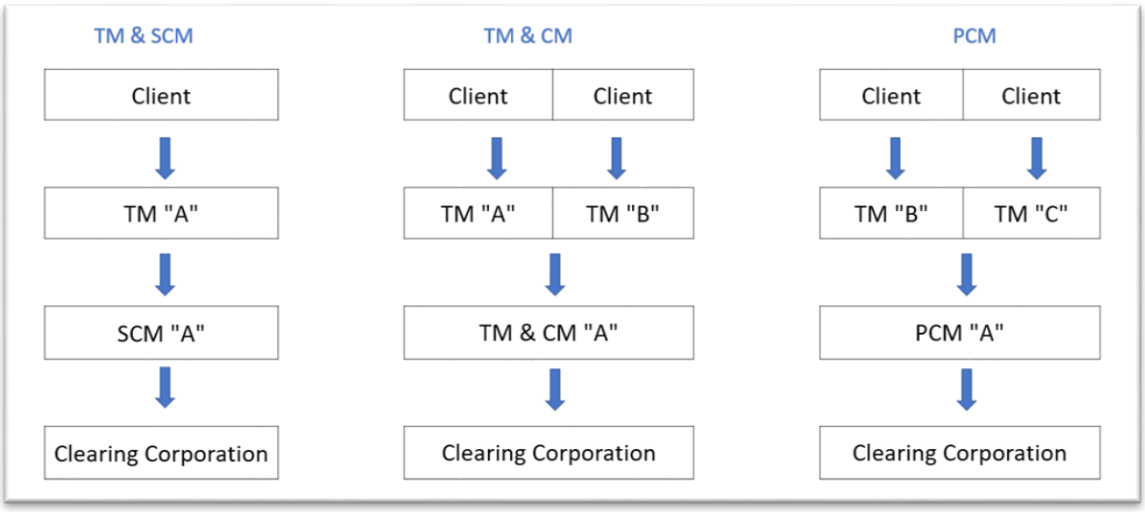
Clearing Members have clearing and settlement rights in any recognized clearing corporation. Clearing Members help in clearing of the trades of their clients. There are three kinds of clearing members - Professional Clearing Members (PCM), Trading Cum Clearing Member (TCM) and Trading cum Self Clearing Member (SCM).

Trading cum Self-clearing member: They have trading as well clearing rights. They clear and settle trades executed by them only, either on their own account or on account of their clients but not for custodian participants.

Trading member-cum-clearing member: They have trading as well clearing rights. They clear and settle their own trades as well as trades of other trading members and custodial participants.

Professional clearing member: They have only clearing rights and do not have trading rights. They clear and settle trades executed by trading members and custodian participants. SEBI registered custodian and Banks recognized by clearing corporations are eligible to become PCM subject to fulfilling the prescribed criteria.

Pictorial representation of various kind of clearing member is given below:



Clearing Members handle the responsibility of clearing and settlement of all deals executed by Trading Members, who clear and settle such deals through them. Clearing Members perform the following important functions:

- Clearing: Computing obligations of all his trading members i.e., determining positions to settle.
- Settlement: Performing actual settlement.
- Risk Management: Setting position limits based on upfront deposits / margins for each trading member/client and monitoring positions on a continuous basis.
- Confirmation of custodian participant trade.

7.2.3 Clearing Banks

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. In case of a pay-out clearing member receives the amount on pay-out day. All transactions of pay-in/pay-out of funds are carried out by these clearing banks. The pay-in obligation details are passed on to the clearing banks by clearing corporation, who then debit the clearing member account and based on pay-out instruction from clearing corporation, the clearing bank will credit the receiving member clearing account. In case of ETIRD this mainly happens on T+1 day. The clearing banks are required to provide certain minimum services as specified by Clearing Corporation to clearing members.

7.2.4 Depository & Depository Participants

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 Depository provides its services to clients through its agents called Depository Participants (DPs). Since current Exchange Traded Interest Rate Derivatives (ETIRD) does not have physical settlement, the role of Depository and DPs are mainly limited towards pledge and re-pledge of securities as collateral towards margin.

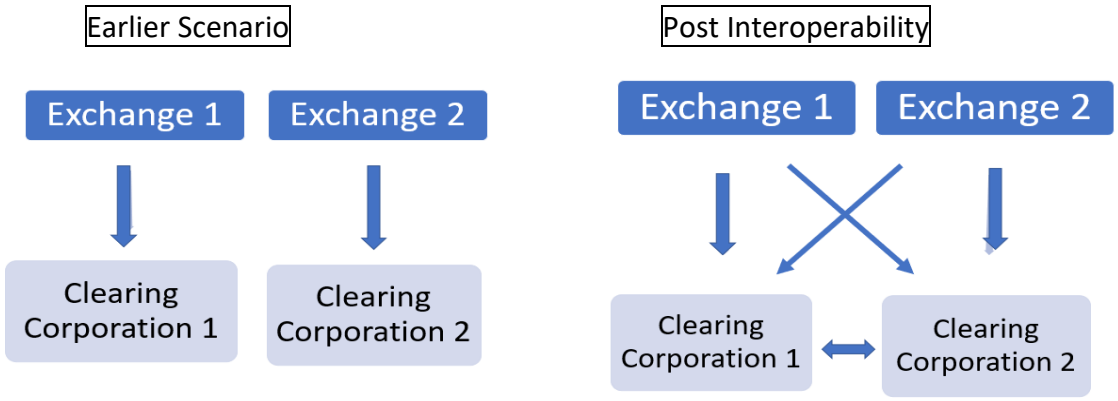
7.3 Interoperability among Clearing Corporations

SEBI introduced the concept of Interoperability among Clearing Corporations which necessitates linking of multiple Clearing Corporations. Inter-operability among Clearing Corporation (CC) has enabled a Clearing Member to select the Clearing Corporation of its choice to clear and settle trades executed in multiple exchanges. It allows market participants to consolidate their clearing and settlement functions at a single Clearing Corporation, irrespective of the stock exchange on which the trade is executed. It is expected that the interoperability among Clearing Corporations would lead to efficient allocation of capital for the market participants, thereby saving on costs as well as provide better execution of trades.

The interoperability framework is applicable to all the recognised clearing corporations excluding those operating in International Financial Services Centre (IFSC) and all the products available for trading on stock exchanges, except commodity derivatives, made available under this framework. The recognised clearing corporations shall establish peer-to-peer link for ensuring interoperability. A clearing corporation shall maintain special arrangements with another clearing corporation and shall not be subjected to normal participant (membership) rules. Risk management between the clearing corporations shall be based on a bilaterally approved framework and shall ensure coverage of inter-clearing corporation exposures. Clearing corporations shall exchange margins and other financial resources on a reciprocal basis based on mutually agreed margining models.

To manage the inter-Clearing Corporation exposure in the peer-to-peer link, Clearing Corporations shall maintain sufficient collateral with each other so that any default by one Clearing Corporation, in an interoperable arrangement, would be covered without financial loss to the other non-defaulting Clearing Corporation. The inter- Clearing Corporation collateral shall comprise two components, viz. (a) Margins as per the existing Risk Management Framework (initial margin, extreme loss margin, calendar spread margin, etc.) prescribed by SEBI; and (b) Additional capital, to be determined by each Clearing Corporation, based on the credit risk from the linked Clearing Corporation, on which no exposure shall be granted to the linked Clearing Corporation.

Pictorial representation of Interoperability among clearing corporations



Following are some of the benefits of Interoperability among clearing corporations

- Choice to participants to choose the clearing corporation
- Better capital utilization
- Reduce trading disruption
- Reduce aggregate exposure
- Reduced operational complexity
- Enhanced market competition and lower cost of clearing
- Execution risk can be decoupled from settlement risk as there can be an 'arm's length' relationship between the exchange and adjunct clearing corporation.

7.4 Clearing 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 (CMs) are arrived at by aggregating the open positions of all the TMs and all custodial participants clearing through him. A TM's open position is arrived at as the summation of his proprietary open position and clients' open positions. While entering orders on the trading system, TMs are required to identify the orders, whether proprietary (if own trades) or client (if entered on behalf of clients) through 'Pro/Cli' indicator provided in the order entry screen. Proprietary positions are calculated on net basis (buy - sell) for each contract[38]. Clients' positions are arrived at by summing together net (buy - sell) positions of each individual client. Please note that positions are only netted for each client and not netted across clients and are rather added up across clients. A TM's open position is the sum of proprietary open position, client open long position and client open short position.

[38] The contract will be distinguish based on futures and option, underlying instrument, expiry date, strike price, put/call.

To illustrate, consider a clearing member 'A' with trading members clearing through him 'PQR' and 'XYZ'.

			Proprietary Position			Client 1			
TM	Instrument	Expiry	Buy qty*	Sell qty	Net qty	Buy qty	Sell qty	Net qty	Position
PQR	91 Day T-Bills Futures	Oct 21	5000	3000	2000	3000	2000	1000	Long 3000
	6.10 % GOI 2031 futures	Oct 21	1000	2000	(1000)	2000	1000	1000	Long 1000 Short 1000
XYZ	91 Day T-Bills Futures	Oct 21	2000	4000	(2000)	3000	4000	(1000)	Short 3000
	6.10 % GOI 2031 futures	Oct 21	1000	3000	(2000)	2000	1000	1000	Long 1000 Short 2000

*Qty indicate lots

Please note that while computing open position of PQR long position of client 1 were not netted off against short position of proprietary book for 6.10 % GOI 2031 futures. Further there is no netting between long position of proprietary book in 91 Day T-Bills Futures with short position of proprietary book in 6.10 % GOI 2031 futures. The positions were rather summed up to compute open position of PQR as a TM. Trading member PQR overall open position in 91 Day T-Bills Futures October series will be long 3000 lots and in 6.10 % GOI 2031 futures October series will be long 1000 and short 1000 lots. Similarly, trading member XYZ overall open position in 91 Day T-Bills Futures October series will be short 3000 lots and in 6.10 % GOI 2031 futures October series will be long 1000 and short 2000 lots. Similarly, no netting will be given to clearing members for counter positions of trading members. The positions were rather summed up to compute open position of clearing member A.

Hence, clearing member A's overall open position in 91 Day T-Bills Futures October series will be long 3000 and short 3000 lots and in 6.10% GOI 2031 futures October series will be long 2000 and short 3000 lots.

7.5 Determination of Settlement Obligations

7.5.1 Settlement of Admitted Deals

Admitted deals executed on a trading day, shall be cleared on a netted basis, by the Clearing Corporation as prescribed under the relevant regulation. Subject to the above, settlement obligations for all clearing members shall arise. The clearing members shall be responsible for all obligations arising out of such trades including the payment of margins, penalties, any other levies and settlement of obligations of the trades entered by them

as trading members and also of those trading members and custodial participants, if any, for whom they have undertaken to settle as a clearing member. Where the clearing member is not a trading member of the Exchange then the trades of those trading members and custodial participants of the Exchange for whom the clearing member has undertaken to settle shall be considered for determining the obligations as a clearing member.

7.5.2 Confirmation of trades entered for custodial participants

Custodial participants are those constituents who are eligible for trading through multiple trading members and who clear and settle deals through single clearing member. Such custodial participants shall register themselves with the Clearing Corporation through their clearing members and avail unique code (custodian participant code) which is link to their clearing member. Clearing members of the custodial participants shall confirm trades entered by trading member of the custodial participants. Such trades shall be confirmed by the clearing members in such manner, within such time and through such facility as may be provided to clearing members from time to time. Such confirmation shall be carried out within such time as may be specified by the Exchange / Clearing Corporation from time to time where such trades have been entered. All such trades which have been confirmed by clearing members shall form part of the obligations of clearing members concerned and such clearing members shall be responsible for all obligations arising out of such trades including the payment of margins, penalties, any other levies and settlement of obligations. Trades which have not been confirmed by clearing members of the custodial participants shall be considered as trades pertaining to the trading members entering such trades and shall form a part of the obligations of clearing members, who clear and settle for such trading members.

7.5.3 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:

a) ***Daily mark to market settlement of futures contract***: Daily settlement prices will be computed for futures contracts based on specified methodology. All open positions will be marked to market at the settlement prices to determine mark to market obligations to be settled in cash. All open positions will be carried forward at the latest daily settlement prices.
b) **Final settlement for futures contract which are cash settled** (currently all ETIRD contracts available on Exchanges are cash settled): All positions (brought forward, created during the day, closed out during the day) of a clearing member in futures contracts, at the close of trading hours on the last trading day of the contract which are cash settled, shall be marked to market at final settlement price (for final settlement) and settled.

c) **Premium settlement for option contracts:** Premium settlement in respect of admitted deals in options contracts shall be cash settled by debit / credit of the clearing accounts of clearing members with the respective clearing bank. 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.

d) **Exercise settlement for cash settled option contracts** (currently all ETIRD contracts available on Exchanges are cash settled)**:** In case of ETIRD, all in-the-money contract get exercised automatically. In-the money long positions contracts shall be assigned to short positions in option contracts with the same series on a random basis. For option contracts that are to be cash settled shall be by debit/ credit of relevant clearing accounts of relevant clearing members with the respective clearing bank towards the exercise settlement value for each unit of the option contract.

e) ***Netted obligation***: Fund obligation is computed for clearing member on a netted basis considering all the above obligations. As ETIRD is part of currency derivatives segment, funds obligation is generated on netted basis considering ETIRD and ETCD (Exchange Traded Currency Derivatives) obligations of a clearing member. Hence, clearing member will either have funds pay-in or funds pay-out for a day.

f) **Delivery Settlement** (In case ETIRD is settled physically): In respect of contracts to be settled through delivery the following positions shall be considered:
   - All open futures positions after close of trading on expiry day
   - All in-the-money option contracts which are exercised and assigned

7.6 Position Limits

In order to avoid building up of huge open positions, the regulator has specified the maximum allowable open position limit at client level, member level etc. Position limits are the maximum exposure levels (open position) which the entire market can go up to and each trading member or investor can go up to.

Position limit for Cash Settled Interest Rate Derivatives (futures and options) on G-Sec (GOI securities)

Category	**Position limits for 8-11 year bucket**	**Position limits each for 4-8 and 11-15 years bucket**
Trading members, institutions in Category I and II FPIs (i.e., other than individuals, family offices and companies), Banks and Primary Dealers, Mutual Funds (at AMC level),Insurance Companies, Pension Funds and Housing Finance companies	10% of Open Interest or INR 1,200 crore (60000 lots) whichever is higher	10% of Open Interest or INR 600 crore (30000 lots) whichever is higher

Category	Position limits for 8-11 year bucket	Position limits each for 4-8 and 11-15 years bucket
Non – Institutions in Category II FPIs (i.e., individuals, family offices and companies), Mutual Fund (Scheme level) and other clients	3% of Open Interest or INR 400 crore (20000 lots) whichever is higher	3% of Open Interest or INR 200 crore (10000 lots) whichever is higher

Exchange level overall open position limit on all IRD contracts on a specific underlying shall not exceed 25% of the outstanding underlying bond.

Position limit for 91 Day T-Bills Futures and Overnight MIBOR futures

Category	91 Day T-Bills Futures
Trading members	15% of the total open interest or Rs.1000 crores whichever is higher
Clients	6% of total open interest or Rs.300 crores whichever is higher

Category	Overnight MIBOR futures
Trading members and institutional clients (including primary dealers)	15% of the total open interest or Rs.1000 (200 contracts) crores whichever is higher
Clients	Higher of 6% of open interest or Rs.300 Crores (60 contracts)

Position limit for Corporate Bond Index futures

Category	**Position limits for 8-11 year bucket**
Trading members, institutions in Category I and II FPIs (i.e., other than individuals, family offices and companies), Banks and Primary Dealers, Mutual Funds (at AMC level),Insurance Companies, Pension Funds and Housing Finance companies	The gross open positions across all contracts within the respective underlying index shall not exceed 10% of the total open interest or INR 1200 Crs whichever is higher
Non- institutions in Category II FPIs (i.e., individuals, family offices and companies), Mutual Fund (Scheme level) and other clients	The gross open positions across all contracts within the respective underlying index shall not exceed 3% of the total open interest or INR 400 Crs whichever is higher

No separate position limit is prescribed at the level of clearing member. However, the clearing member shall ensure that his own trading position and the positions of each trading member clearing through him is within the limits specified above. For the purpose of computing the client level gross open position, long position shall be considered as Long Futures, Long Calls; and Short Puts and Short Position shall be considered as Short Futures, Short Calls, and Long Puts.

Additional limits for FPIs:

- The total gross short (sold) position of each FPI in Interest Rate Derivatives contracts shall not exceed its long position in the government securities and in Interest Rate Futures, at any point of time.
- The aggregate long position of all FPIs, each of whom has a net long position in any IRF instrument, shall not exceed ₹ 5000 crore, aggregated across all IRF instruments
- No FPI can acquire net long position in excess of INR 1,800 crore at any point of time.

For monitoring limit of FPIs Stock Exchanges (SE) adhere the following mechanism:
Stock Exchange will aggregate net position in IRD of all FPIs taken together at the end of the day and jointly publish the same in their website on daily basis. Once 90% of the limit is utilise SE will put necessary mechanism to get alerts and publish on their website the available limits on daily basis. In case of any breach of limit, FPIs whose investment cause the breach shall square off their excess position within 5 trading days or expiry of contract whichever is earlier.

Monitoring of position limits:

The position limit linked to open interest of the Exchange shall be applicable at the time of opening a position. Positions during the day are monitored based on the total open interest of the Exchange at the end of the previous day's trade. Such positions shall not be required to be unwound immediately by the trading member in the event of a drop of total open interest in Interest Rate Derivatives contracts within the respective maturity bucket. However, in the aforementioned scenario, the trading member shall not be allowed to increase their existing positions or create new positions of the respective maturity bucket till they comply with the applicable position limits.

Clearing corporation end of day provides Exchange wise position limit applicable to various clients and member for next day. The position limits are always specified in number of lots.
For example, suppose at EOD in Exchange "A" total open interest for 8–11-year bucket is 10 lacs contracts and in Exchange "B" it is 5 lacs contracts. Then position limits for 8–11-year bucket applicable for next day will be as follows:

Category	**Exchange A**	**Exchange B**
Trading members, institutions in Category I and II FPIs (i.e., other than individuals, family offices and companies), Banks and Primary Dealers, Mutual Funds (at AMC level),Insurance Companies, Pension Funds and Housing Finance companies	Higher of 10% of 10 lacs contract = **1 lac contract** Or 60000 contracts. Position limit = 1 lac contracts	Higher of 10% of 5 lacs contract = 50000 contract Or **60000 contracts**. Position limit = 60000 contracts
Non- institutions in Category II FPIs (i.e., individuals, family offices and companies),Mutual Fund (Scheme level) and other clients	Higher of 3% of 10 lacs contract = **30000 contract** Or 20000 contracts. Position limit = 30000 contracts	Higher of 3% of 5 lacs contract = 15000 lacs contract Or **20000 contracts**. Position limit = 20000 contracts

Monitoring of position limits are done by the Exchanges and /or clearing corporation. When the open position any trading member/client, exceeds the specified limit at any

time, it shall be treated as a violation. The clearing member is accountable for positions of all trading members and clients of trading members clearing through him. Similarly, the trading member is accountable for the positions of his clients. Exchange / Clearing Corporation may take following action against trading member and/or client level position limit violation.

- Trading Member shall be restrained from taking any further positions in which there is violation and trading member shall be required to bring their positions within the specified limit.
- Trading member may use the existing close-out facility to place close-out orders in which there is violation.
- Penalty can be levied for such violation

7.7 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.

GOI bond futures can be either cash settled or physically settled (for notional GOI bond futures) as per the current guidelines. However currently none of the Exchange facilitate physical settled interest rate bond future contracts. The GOI bond futures that are currently traded are all cash settled. Further, GOI bond options, 91 Day T-Bills futures and Overnight MIBOR futures are also cash settled. All open positions on the last trading day of the futures contract shall be marked to the final settlement price of the relevant futures contract and shall be cash settled. The profit / loss resulting there from shall be paid to/ received from such member in accordance with the laid down settlement procedures in this regard. In case of GOI bond options all In the money (ITM) contracts are get exercised automatically and the amount is debited / credited to relevant clearing member. The daily & final settlement of cash settled ETIRD trades are done on T+1 working day. The funds pay-in and pay-out of daily mark to market settlement, final settlement of futures contracts which are cash settled, premium settlement and the final exercise settlements of options contracts which are cash settled are typically effected before start of market hours on the next day. The Clearing Corporations announces the settlement schedule for various segments/products on a periodic basis.

Settlement Price for ETIRD contracts are given in the following table:

Product	Settlement	Price
Cash Settlement GOI Bond Futures	Daily Settlement	Closing price of the futures contracts for the trading day. (The closing price for a futures contract shall be calculated on the basis of the last half an hour weighted average price across Exchanges of such contract)
Un-expired illiquid GOI Bond futures contracts	Daily Settlement	Theoretical Price computed as per formula Cash Price** + Financing cost – Income on cash position
Cash Settlement GOI Bond Futures & Options	Final Settlement	Weighted average price of the underlying bond based on the last two hours of the trading on NDS-OM[39] subject to minimum of 5 trades otherwise, the FIMMDA / FBIL price is applicable
91 Day T-Bills Futures	Daily Settlement	100 – (0.25 * Yw) Where Yw (futures yield) shall be volume weighted average futures yield of traded futures contracts in the last 30 minutes of trading subject to there being at least 5 trades. Failing which, trades during the last 60 minutes shall be used for the calculation, subject to at least 5 trades. Failing which, trades during the last 120 minutes shall be used for the calculation, subject to at least 5 trades.
Unexpired illiquid 91 Day T-Bills Futures	Daily Settlement	A theoretical futures yield would be used for computation. The latest available Treasury Bill Yield Curve published by FBIL of various tenors shall be used for computation of theoretical futures
91 Day T-Bills Futures	Final Settlement	100 – (0.25 * Yf) Where Yf is weighted average discount yield obtained from RBI's weekly auction of 91-day GOI T-Bill on the day of expiry.

[39] NDS-OM is a screen based electronic anonymous order matching system for secondary market trading in Government securities owned by RBI.

Product	Settlement	Price
Overnight MIBOR Futures	Daily Settlement	Daily settlement rate shall be Volume Weighted Average Rate of trades done in last 30 minutes of trading, subject to min 5 trades else in last 60 minutes of trading, subject to min 5 trades
Unexpired Illiquid Overnight MIBOR Futures	Daily Settlement	Theoretical Daily Settlement rate for near month = (Realised Rate[40] * No. of days lapsed) / Tenor in days + (Expected Rate[41] * Residual No. of days) / Tenor in days Theoretical rate for other month contract shall be computed as forward rate using the relevant MIBOR OIS rates.
Overnight MIBOR Futures	Final Settlement	Simple average of Overnight Call Rate (MIBOR) applicable for the expiry month (based on Overnight MIBOR rate published daily at 10:45 am by FBIL and rounded up to 4 decimals) The period for computation of final settlement rate shall start from the first working day in the contract month till one day prior to final settlement date including Saturdays, Sundays and Scheduled holidays.

** Cash Price : Clean Price + Accrued Interest
Clean price weighted average price (WAP) in last 2 hours on NDS OM. If not traded in last 2 hours then WAP of full day trades on NDS OM. If not traded for entire day then FIMMDA/FBIL price will be considered.

7.7.1 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 (brought forward, created during the day, closed out during the day) 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. Please find below MTM settlement for participant who has sold 1 lot of 6.10% GOI 2031 bond futures @ Rs. 98.90 on 21-XX-2020 and keep open till expiry.

[40] Realized rate shall be computed using daily simple average of Overnight Call Rate (MIBOR) for lapsed number of days.
[41] Expected rate shall be computed using interpolation method using the relevant MIBOR OIS rates.

6.10% GOI 2031 Bond Futures (XX Expiry)				1 contract = 2000 bonds
Date (A)	Sell Price (B)	Settlement Price (C)	Mark to Market Spread (D)	Per contract P&L (E)
			B-C	D*2000
21-XX-20	98.9000	98.6925	0.2075	415.00
22-XX-20	98.6925	98.6225	0.0700	140.00
23-XX-20	98.6225	98.8425	-0.2200	-440.00
24-XX-20	98.8425	98.8550	-0.0125	-25.00
27-XX-20	98.8550	98.8200	0.0350	70.00
28-XX-20	98.8200	98.8450	-0.0250	-50.00
29-XX-20*	98.8450	98.7650*	0.0800	160.00
		Net Effect	**0.1350**	**270.00**

** On expiry – final settlement price*

7.7.2 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.

7.7.3 Final Settlement

Final settlement for futures contract on cash settled Interest Rate Futures on G-Sec:

All positions (brought forward, created during the day, closed out during the day) of a clearing member in futures contracts, at the close of trading hours on the last trading day of the contract, shall be marked to market at final settlement price (for final settlement) and settled in cash on T+1 day by debit/ credit of the clearing accounts of clearing members with the respective clearing bank. Open positions in a futures contract shall cease to exist after its expiration day.

Final exercise settlement for option contracts on cash settled Interest Rate Futures on G-Sec:

On expiry date, all open long in-the-money contracts shall be automatically exercised at the final settlement price and assigned on random basis to the open short position of the same strike and series. Exercise settlement shall be effected on T+1 day by debit/ credit of the clearing accounts of clearing members with the respective clearing bank. Exercise

settlement in respect of admitted deals in option contracts shall be cash settled by debit/ credit of the clearing accounts of the relevant clearing members with the respective clearing bank. Option contracts, which have been exercised, shall be assigned and allocated to clearing members at the client level. Open positions in an option contracts shall cease to exist after its expiration day.

Final settlement of futures contracts on 91 Day GOI T-Bills
All positions (brought forward, created during the day, closed out during the day) of a clearing member in futures contracts on 91 Day GOI T-Bills, at the close of trading hours on the last trading day, shall be marked to market at final settlement price (for final settlement) and settled in cash on T+1 day by debit/ credit of the clearing accounts of clearing members with the respective clearing bank. Upon completion of the final settlement, no positions in such futures contracts shall exist.

Final settlement of futures contracts on overnight call rate (MIBOR)
All positions (brought forward, created during the day, closed out during the day) of a clearing member in futures contracts on Overnight MIBOR, shall be marked to market at final settlement price (for final settlement) and settled in cash on T+1 day by debit/ credit of the clearing accounts of clearing members with the respective clearing bank. Upon completion of the final settlement, no positions in such futures contracts shall exist.

7.8 Funds Settlement

Every clearing member shall maintain and operate a separate and distinct primary clearing account with one of the designated clearing banks. Every clearing member shall maintain and operate a separate and distinct primary clearing account for each segment. Since ETIRD is part of currency derivatives segment, clearing members having funds obligation to pay should have clear balance of requisite funds in the clearing accounts of CDS on or before the stipulated funds pay-in day and the stipulated time.

- Pay-in of funds: Clearing Corporation advises Clearing Banks to debit account of Clearing members and credit its account and clearing bank does the same.
- Pay-out of funds: Clearing Corporation advises Clearing Banks to credit account of Clearing members and debit its account and clearing bank does the same.

Clearing members can deposit funds into these accounts in any form and can withdraw funds from these accounts only in self-name.

7.8.1 Mode of Payment from Clients

Brokers should not accept cash from the client whether against obligations or as margin for transaction done of Exchange. All payments shall be received / made by the brokers from / to the clients strictly by account payee crossed cheques / demand drafts or by way of direct credit into the bank account through EFT, or any other mode allowed by RBI. The brokers shall accept cheques drawn only by the clients and also issue cheques in favour of the clients only, for their transactions. Member shall maintain an audit trail of the

funds received through electronic fund transfers to ensure that the funds are received from their clients only.

SEBI vide circular[42] dated June 2022 and November 11, 2022 has specified "Naming / Tagging of demat accounts maintained by Stock Brokers". Highlights of the circular are as follows:

- Bank accounts and Demat accounts maintained by all stock brokers shall have appropriate nomenclature to reflect the purpose for which those bank/demat accounts are being maintained.
- The nomenclature for bank accounts and demat accounts to be followed is given as under:
    - SEBI has mandate to maintain designated client bank account(s) "Name of Stock Broker -Client Account" to receive/pay funds from/to their clients. SEBI vide circular dated December 13, 2023, has advise to change the nomenclature of all such accounts either of the following two categories of bank accounts.
        - Up Streaming Client Nodal Bank Account (USCNBA): SB/CM shall receive clients' funds in USCNBA. The nomenclature for such accounts shall be "Name of the SB/CM –USCNB account"
        - Down Streaming Client Nodal Bank Account (DSCNBA): Payment to clients shall be done only from DSCNBA account. The nomenclature for such accounts shall be "Name of the SB/CM – DSCNB account"
    - Bank account(s) held for the purpose of settlement would be named as "Name of Stock Broker -Settlement Account".

    - Stock brokers are required to maintain demat accounts only under the following 6 categories specified by SEBI.

Sr. No.	Demat Account Category	Purpose of Demat Account
1	Proprietary Account	Hold own securities
2	Pool account	Settlement Purpose
3	Client Unpaid Securities Pledgee Account	For pledging of Unpaid Securities of Clients
4	Client Securities Margin Pledge Account	For Margin obligations to be given by way of Pledge/ Re-pledge
5	Client Securities under Margin Funding Account	Hold funded securities in respect of margin funding
6	Client Nodal MFOS Account	For subscription/ redemption of MFOS units

[42] https://www.sebi.gov.in/legal/circulars/jun-2022/naming-tagging-of-demat-accounts-maintained-by-stock-brokers_59830.html

7.8.2 Settlement of accounts (funds)

SEBI, vide circular no. MIRSD/SE/Cir-19/2009 dated December 03, 2009 and SEBI/HO/MIRSD/MIRSD2/CIR/P/2016/95 dated September 26, 2016, issued the guideline for settlement of running account of client's funds / securities. The settlement of funds and / or securities shall be done within 1 working day of the pay-out, unless client specifically authorizes the stock broker in writing to maintain a running account. As specified by SEBI, the actual settlement of funds and securities shall be done by the member depending on the mandate of the client and there must be a gap of maximum 90 / 30 days (as per the choice of client viz. Quarterly / Monthly) between two settlements of running account. Vide SEBI circular no. CIR/HO/MIRSD/DOP/CIR/P/2019/75 dated June 20, 2019, settlement of running account for securities has been discontinued and therefore, SEBI circulars dated December 03, 2009 and September 26, 2016, are now applicable for settlement of running account of client's "funds" only.

While settling the account, the member should simultaneously send to the client a 'statement of accounts' containing an extract from the client ledger for funds and an extract from the register of securities displaying all receipts/deliveries of funds/securities. The statement should also explain the retention of funds/securities and the details of the pledge, if any. For the purpose of quarterly/monthly settlement trading member may settle across segments of the same Exchange for a particular client.

SEBI has given direction for handling of client securities by trading member/clearing member and also issued following advice with respect to a TM/CM maintaining a running account for client securities and pledging the client securities with Banks/NBFCs.[43]

- The securities received in pay-out against which payment has been made by clients, shall be transferred to the demat account of the respective clients within one working day of the pay-out. Such securities shall be transferred directly from the pool account of the TM/CM to the demat account of the respective client.
- With regard to the unpaid securities (i.e., the securities that have not been paid for in full by the clients), such securities shall be transferred to respective client's demat account followed by creation of an auto-pledge (i.e., without any specific instruction from the client) with the reason "unpaid", in favor of a separate account titled –"client unpaid securities pledgee account", which shall be opened by TM/CM.
- After the creation of pledge, a communication (email / SMS) shall be sent by TM/CM informing the client about their funds obligation and also about the right of TM/CM to sell such securities in event of failure by client to fulfill their obligation.
- If the client does not fulfil its funds obligation, TM / CM shall dispose-off such unpaid securities in the market within five trading days after the pay-out. TM/CM, before

[43] SEBI circular CIR/HO/MIRSD/DOP/CIR/P/2019/75 dated June 20, 2019 & SEBI/HO/MIRSD/MIRSD-PoD-1/P/CIR/2022/153 dated November 11, 2022.

disposing the securities, shall give an intimation (email / SMS) to the client, one trading day before such sale.

- TM / CM shall invoke the pledge only against the delivery obligation of the client. On invocation, the securities shall be blocked for early pay-in in the client's demat account with a trail being maintained in the TM/CM's client unpaid securities pledgee account.
- In case, such pledge is neither invoked nor released within seven trading days after the pay-out, the pledge on securities shall be auto released and the securities shall be available to the client as free balance without encumbrance.
- Such unpaid securities pledged in client's account shall not be considered for the margin obligations of the client.
- Further, SEBI has restricted broker to pledge client securities to the Banks/NBFCs for raising funds, even with authorization by client as the same would amount to fund-based activity by TM/CM which is in contravention of Rule 8(1)(f) & 8(3)(f) of Securities Contracts (Regulation) Rules, 1957.

SEBI, vide circular no. SEBI/HO/MIRSD/DOP/CIR/P/2020/28 dated February 25, 2020, discontinued title transfer of securities to the demat account of TM for margin purposes and TM shall accept collateral from the clients in the form of securities only by way of 'margin pledge' created in the Depository system.

Further, SEBI vide circular SEBI/HO/MIRSD/MIRSD-PoD1/P/CIR/2023/197dated December 28, 2023, revised guideline for "Settlement of Running Account of Client's Funds lying with Trading Member (TM)" and vide circular SEBI/HO/MIRSD/MIRSD-PoD1/P/CIR/2025/1 dated January 06, 2025, regarding "Measure for ease of doing business -Settlement of Account of Clients who have not traded in the last 30 days". Some of the details are given below:

- The settlement of running account of funds of the client shall be done by the TM after considering the End of the day (EOD) obligation of funds as on the date of settlement across all the Exchanges, at least once within a gap of 30 / 90 days between two settlements of running account as per the preference of the client. The settlement of running account of funds of the client shall be done after considering the End of the day (EOD) obligation of funds across all Exchanges, shall settle the running accounts at the choice of the clients on Quarterly and monthly basis, on the dates stipulated by the Exchanges. To ensure uniformity and clarity on date of such monthly and quarterly settlement of client accounts, Stock exchanges shall, jointly, issue the annual calendar for the settlement of running account (quarterly and monthly) at the beginning of the financial year.
- Further, to safeguard against any possibility of misuse of one client's funds to settle another clients' running account, it is stipulated that any funds received from clients shall remain in the upstreaming account. Trading Member shall

ensure that funds, if any, received from clients, whose running account has been settled, remain in the "Up Streaming Client Nodal Bank Account" and no such funds shall be used for settlement of running account of other clients. Stock Exchanges shall evolve a monitoring mechanism for this purpose. The settlement as mentioned shall be effective (i) quarterly settlement of Jan-Mar 2024 and (ii) monthly settlement of January 2024.

- The required bank details for initiating electronic fund transfers shall be obtained from new clients and shall be updated for existing clients. Only in cases where electronic payment instructions have failed or have been rejected by the bank, then the stock broker may issue a physical payment instrument.
- In case of client having any outstanding trade position on the day on which settlement of running account of funds is scheduled, a TM may retain funds calculated in the manner specified in this circular.
- Client's running account shall be considered settled only by making actual payment into client's bank account and not by making any journal entries. Journal entries in client account shall be permitted only for levy / reversal of charges in client's account.
- For the clients having credit balance, who have not done any transaction in the 30 calendar days since the last transaction and any amount of such client's funds is lying with member for more than such 30 calendar days, the entire credit balance of client shall be returned to the client by TM, on the upcoming settlement dates of monthly running account settlement cycle (irrespective of settlement cycle preferred by the client) as stipulated by stock exchanges . However, if the client trades after 30 calendar days and before aforesaid upcoming settlement dates of monthly running account settlement cycle, the settlement of account of client shall continue to be done by the Trading member as per the preference of quarterly/monthly as indicated by the client for running account settlement.
- The Authorized person is not permitted to accept client's funds and securities. The TM should keep a proper check. Proprietary trading by Authorized person should be permitted only on his own funds and securities and not using any of the client's fund.
- Once the TM settles the running account of funds of a client, an intimation shall be sent to the client by SMS on mobile number and also by email. Client shall bring any dispute on the statement of running account, to the notice of TM within 30 working days from the date of the statement.

7.8.3 Sending account statements to clients

The stock broker shall send a complete `Statement of Accounts' for both funds and securities in respect of each of its clients containing extract of from the client ledger for funds, an extract from the register of securities displaying all receipts and deliveries of securities and a statement explaining the retention of funds and / or securities in such periodicity and format within such time, as may be prescribed by the relevant Exchange, from time to time, where the trade is executed. The Statement shall also state that the

client shall report errors, if any, in the Statement within such time as may be prescribed by the relevant Exchange from time to time where the trade was executed, from the receipt thereof to the Stock broker.

Further, SEBI, vide its letter dated November 27, 2017 has directed that all members shall issue an **Annual Global Statement** to their clients. The statement shall be issued within 30 days from the end of the financial year and shall contain details of all transactions executed by the client in the financial year, details of all charges etc.

7.8.4 Fund Shortages

Non-fulfilment of settlement obligation towards settlement of contracts traded on currency derivatives segment including ETIRD by the scheduled date and time shall be treated as a violation. In case of a settlement shortages, in additional to monetary penalty, clearing corporation may advise the Exchanges to withdraw any or all of the membership rights of the clearing member including the withdrawal of trading facilities of all trading members and/ or clearing facility of custodial participants clearing through such clearing member. In certain cases, Clearing Corporation may block the shortage amount from effective deposits of clearing member.

7.9 Delivery Under Physical Settlement

Currently all bond futures are cash settled, hence the following is only for study and reference. To enable physical settlement for imaginary notional bond[44], other bonds of the central government are to be made eligible for delivery and are designated as deliverable bonds, which must satisfy specified criteria.

It is desirable to allow multiple securities for delivery because of two reasons. First, institutional investors generally adopt buy-and-hold strategy. Since the outstanding stock of a bond is much less compared to floating stock of equities, the bond will quickly lose liquidity in cash market, which in turn will affect the liquidity of futures. Second, given the low outstanding stock of bonds, market manipulators can easily create squeeze by simultaneously buying the bond in cash market and buying futures. It must be noted, however, that the facility to allow multiple securities for delivery will be effective only when they are not much different in their cost of delivery.

Deliverable Grade Securities

Exchanges shall select their own basket of securities from the eligible Deliverable Grade Securities, viz., GOI securities maturing at least 7.5 years but not more than 15 years from the first day of the delivery month with a minimum total outstanding stock of Rs 10,000 crore. Exchanges shall disclose upfront to the market participants the composition of the basket of deliverable grade securities and the associated conversion factors for each of

[44] 7% 10-year GOI notional bond

the quarterly contracts. Revision of Basket of Deliverable Grade Securities disclosed upfront by the Exchange for each of the quarterly contracts, additions, if any, shall be made not later than 10 business days before the first

Delivery Schedule

T+0 day

Delivery notice: It is the day when the selling Clearing Member (CM) sends a notice to the Clearing Corporation (CC) expressing his intention to deliver along with details of the security to be delivered. CM shall send the notice before 6:00 pm IST on the second business day prior to the day he wishes to deliver. For example, if he wishes to deliver on 4th September 20XX and 2nd and 3rd are business days, he shall give notice before 6 PM on 2nd September 20XX. He can deliver on any business day during the delivery month of the contract. Along with the notice, he shall provide the notional face value (equal to its short position in the expiring contract), security ISIN, coupon, maturity date, issuance date, coupon convention, and other details as may be sought by the CC. Based on these details, the CC shall calculate the invoice price.

Allocation: The CC shall identify the eligible long positions for allocation and assign the deliveries to long position holders at client level starting with the highest vintage till the allocation is over. Vintage data shall be computed and maintained at client level for every contract and shall be tracked by the CC on end of day basis. For a given vintage, if the contracts to be allocated (Short) are less than the total long positions, the allocation to such long position holders shall be done on a 'random' basis. Based on the client level allocations as above, CC shall compute CM level deliverable/receivable obligations using multilateral netting and intimate the identified long position holders, by 8 pm IST on the date of receipt of notice, the details of the securities that they would be receiving and the invoice price. The seller CM shall not be permitted to fulfil an individual futures contract by delivering a mixed portfolio of deliverable security (for example, Rs.1,20,000 face value of one issue and Rs. 80,000 face value of another issue is not permissible). However, a selling CM making delivery for more than one futures contract, say two contracts, may deliver two deliverable securities for two different contracts (Rs.2,00,000 face value of one issue for one contract and Rs.2,00,000 face value of another issue for the other contract).

T + 2 day

On the second business day following the receipt of the delivery notice, the CMs shall discharge their obligations and the CC shall complete the settlement accordingly.

Delivery Month: The delivery month shall be the last month of the expiring contract, i.e., March, June, September and December.

In case there is a failure to honour the settlement obligation by the CM, the following action shall be followed:

i) Selling CM fails to deliver the securities

T+0 day: Selling CM gives intention to deliver the securities
T+2 day: Buying CM pays-in funds and the selling CM fails to deliver the securities
T+2 or T+3 day: CC shall conduct buy-in auction of the securities.
In case of successful auction, the defaulting CM shall be debited by:
the actual auction price, difference in invoice price and auction price, if the auction price is less than the invoice price, and a penalty of 2% of the face value of security short delivered.
In case of unsuccessful auction, transaction shall be closed out wherein the defaulting CM shall be debited by:
Invoice price, and a penalty of 5% of the face value of security short delivered.
In respect of the seller in an auction failing to honour the auction obligations, he shall be debited by:
invoice price, and a penalty of 3% of the face value of security short delivered These penalties shall be passed on to the buying CM, who shall pass it on to the buying client.

ii) Buying CM fails to pay-in funds

T+0 day: Selling CM gives intention to deliver the securities
T+2 day: Selling CM delivers securities, and the buying CM fails to pay-in funds.
The CC shall pay-out funds to the selling CM on T+2 day

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.

Settlement Mechanism

The contract would be settled by physical delivery of deliverable grade securities using the electronic book entry system of the existing Depositories (NSDL and CDSL) and Public

Debt Office (PDO) of the RBI. The delivery of the deliverable grade securities shall take place from the first business day of the delivery month till the last business day of the delivery month. The owner of a short position in an expiring futures contract shall hold the right to decide when to initiate delivery. However, the short position holder shall have to give intimation, to the Clearing Corporation, of his intention to deliver two business days prior to the actual delivery date. Last delivery day is last business day of the delivery month.

Conversion Factor

The Conversion Factor for deliverable grade security would be equal to the price of the deliverable security (per rupee of the principal), on the first day (calendar day) of the delivery month, to yield 7% with semi-annual compounding. For deliveries into 10-Year Notional Coupon-bearing GOI security futures, the deliverable security's remaining term to maturity shall be calculated in complete three-month quarters, always rounded down to the nearest quarter. If, after rounding, the deliverable security lasts for an exact number of 6-month periods, the first coupon shall be assumed to be paid after 6 months. If, after rounding, the deliverable security does not last for an exact number of 6-month periods (i.e., there are an extra 3 months), the first coupon would be assumed to be paid after 3 months and accrued interest would be subtracted.

Invoice Price

Invoice Price of the respective deliverable grade security would be the futures settlement price times a conversion factor plus accrued interest.

The settlement amount is computed after taking into account the deliverable security, conversion factor and accrued interest relevant to that security; and the final settlement price fixed by the Exchange. The amount of cash payable by buyer to seller, called invoice amount (IA), is computed as follows:

$$IA = \left[(SP \times CF) + AI \right] \times \frac{CA}{100}$$

where,

SP:	Final settlement price (per 100 of face value)
CF:	Conversion factor applicable to that deliverable bond
AI:	Accrued interest (per 100 of face value) on the deliverable bond
CA:	Contract amount (or market lot), which is 200,000

Cheapest-to-Deliver (CTD) Bond

The futures seller can deliver any of the deliverable bonds. In theory, the introduction of conversion factor for each deliverable bond should make the seller indifferent to any preference for particular bond. In practice, however, there is a particular bond (called the "cheapest-to-deliver" or CTD bond) that every futures seller will prefer to deliver. The reason for this preference is that the conversion factor does not change during the delivery month while the prices/yields of deliverable bonds do change during trading

hours. Accordingly, the futures price will be tracking the cash market price of the CTD bond.

7.10 Risk Management

A comprehensive Risk Management framework is the backbone of the Clearing Corporation. A clearing corporation provides settlement guarantee i.e., the settlement of securities and funds will take place even if there is a failure by a broker/clearing member to fulfil their obligation. In order to safeguard against such failures, the clearing corporation is required to carry out the risk management measures as specified by SEBI through its various circulars. Clearing Corporations, Risk containment measures include capital adequacy requirements of members, monitoring of member performance and track record, stringent margin requirements, position limits based on capital, online monitoring of member positions and automatic disablement from trading when limits are breached, etc. Risk Management framework mainly consists of the Margin, Liquid Asset, Base minimum capital, Pre-trade risk control, Risk Reduction mode, monitoring of position limit etc. We will be discussing more on margin requirement for ETIRD in the following section.

Following are the salient features of Clearing Corporation Risk Management System:

- On-line real time risk management
    - Online monitoring of margin against liquid assets
    - On-line position limit monitoring
- Scientific way of identifying margin level
- Different kind of margins to cover all kind of losses
- Intra-day and end of day mark to market
- Client level collateral segregation and margining
- Alert to member on various level of collateral utilization
- Risk reduction mode
- Automatic disablement from trading when limits are breached
- Cross margining facility
- Capital adequacy requirements of members
- Monitoring of member performance and track record

Every clearing corporation has a comprehensive risk containment mechanism for the currency derivatives segment. As ETIRD is part of currency derivatives segment same risk containment mechanism will be applicable to them. The salient features of risk containment mechanism on the currency derivatives (including interest rate derivatives) segment are:

1. The financial soundness of the members is the key to risk management. Therefore, the requirements for membership in terms of capital adequacy (net worth, security deposits) are quite stringent.
2. Upfront initial margin & extreme loss margin (ELM) are charged for all the open positions of a CM. The Exchange/CC specifies the initial margin requirements for each

futures contract on a daily basis. It also follows a value-at-risk (VaR) based margining through SPAN® (Standard Portfolio Analysis of Risk). The CM in turn collects the initial margin and ELM from the TMs and their respective clients.

3. The open positions of the members are marked to market based on contract settlement price for each contract. The difference is settled in cash on a T+1 basis for future contract and for option contract same is adjusted against liquid asset.
4. The on-line position monitoring system monitors the member's open positions and margins on a real-time basis vis-à-vis the deposits provided by the CM or the limits set for the TM by the CM. The on-line position monitoring system generates alerts whenever the margin of a member reaches the predetermined percentage of the capital deposited by the CM or limits set for the TM by the CM. The Clearing Corporation monitors the CMs for initial margin and extreme loss margin violations.
5. CMs are provided with a terminal for the purpose of monitoring the open positions of all the TMs clearing and settling through them. A CM may set limits for a TM clearing and settling through him. The Clearing Corporation assists the CM to monitor the intra-day limits set up by a CM and whenever a TM exceeds the limits, it stops that particular TM from further trading.
6. A member is alerted of his position to enable him to adjust his position or bring in additional capital. Margin violations result in withdrawal of trading facility for all TMs of a CM in case of a violation by the CM.
7. Separate settlement guarantee funds for Currency Derivatives segment have been created by each clearing corporation.

Risk Management framework for ETIRD consists of the following:

- Margins
- Liquid Net worth & Liquid Assets
- Pre-trade risk control[45]
- Risk Reduction Mode
- Position Limits[46]

7.10.1 Margin

Margining is a process by which a clearing corporation computes the potential loss that can occur to the open positions (both buy and sell) held by the members across all its clients. Based on the computation, the clearing corporation will ensure that the liquid assets deposited by members are sufficient to cover the potential loss. In stock exchange mechanism, clearing corporation will collect the margins from members and member will collect the margin from their respective clients. Clearing corporation compute margin at client level position and there is no netting of positions between clients / member etc. Clearing Corporation collects various kinds of margin from its member as given below:

[45] Please refer section 6.4

[46] Please refer section 7.6

7.10.1.1 Initial Margin

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[47].

Initial margin requirement:

1. For client positions - shall be netted at the level of individual client and grossed across all clients, at the trading/ clearing member level, without any set-offs between clients.
2. For proprietary positions - shall be netted at trading/ clearing member level without any set-offs between client and proprietary positions.

The margins so computed shall be aggregated first at the trading member level and then aggregated at the clearing member level.

7.10.1.1.1 Computation of Initial Margin

Clearing Corporation adopted SPAN[48] system for the purpose of real time initial margin computation. The SPAN methodology shall be adopted to take an integrated view of the risk involved in the portfolio of each individual client. Initial Margin requirement shall be based on a worst scenario loss of a portfolio of an individual client comprising his positions in options and futures contracts on the same underlying across different maturities and across various scenarios of price and volatility changes. Initial margin requirements shall be based on 99% value at risk (VaR) over a one day time horizon. Value-at-risk (VaR) is a measure of maximum likely price change over a given interval (called "horizon") and at a given confidence level (called "percentile"). However, in the case of futures contracts, where it may not be possible to collect mark to market settlement, before the commencement of trading on the next day, the initial margin shall be computed over a two day time horizon by applying an appropriate statistical formula. SPAN margining uses VaR to compute initial margin but improves upon it with two modifications. It generates 16 "what-if" scenarios. The second and more important feature of SPAN margin is that it considers the entire portfolio of an investor for computing the portfolio-wide margin. The margin is not computed for each position separately. The methodology for computation of value at risk percentage shall be as per the recommendations of SEBI from time to time.

For the purpose of SPAN Margin, various parameters as specified hereunder will be applicable:

Price Scan Range

[47] SEBI/HO/MRD2/DCAP/CIR/P/2020/27 dated February 24, 2020

[48] It is a product developed by Chicago Mercantile Exchange (CME) and is extensively used by leading stock Exchanges of the world. SPAN® uses scenario-based approach to arrive at margins. It generates a range of scenarios and highest loss scenario is used to calculate the SPAN margin.

Product	Based on 6σ subject to minimum percentage of underlying price
Cash settled Interest Rate Derivatives on G-Sec	1.75%
91-Day T-Bills	0.065%
MIBOR	5.50%

Volatility calculation

The standard deviation (volatility estimate) is calculated using the Exponential Weighted Moving Average (EWMA). The estimate at the end of time period t (σt) shall be estimated using the volatility estimate at the end of the previous time period. i.e. as at the end of t-1 time period (σt-1), and the return (rt) observed in the futures market during the time period t. The formula shall as under:

$$(\sigma_t)^2 = \lambda\,(\sigma_{t-1})^2 + (1 - \lambda)\,(r_t)^2$$

The value of λ, the parameter which determines how rapidly volatility estimation changes in the Exponential Weighted Moving Average (EWMA) method, shall be fixed at 0.995. Sigma means the standard deviation of daily returns. The return is defined as logarithmic return.

Volatility Scan Range

For Interest rate derivatives, the volatility scan range for generating the scenarios would be 25% of annualized EWMA volatility subject to minimum 3%.

Updation of risk parameters

The parameters for computation of span margin shall be updated 6 times in the day, based on the prices at 11:00 a.m., 12:30 p.m., 2:00 p.m., 3:30 p.m. end of the day and begin of the day.

7.10.1.1.2 Net Option Value

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. Thus, mark to market gains and losses shall not be settled in cash for options positions.

7.10.1.1.3 Calendar Spread Charge:

A futures position in one expiry month which is hedged by an offsetting position in a different expiry month would be treated as a calendar spread. The following calendar spread margins shall be levied:

Product	Calendar spread charge for spreads in months (INR)			
	1 month	2 months	3 months	4 months or more
Cash settled Interest Rate Derivatives on G-Sec	1700	2000	2300	3200
91-Day T-Bills	110	160	210	260
MIBOR	7000	7500	8000	8000

The margins for options calendar spread shall be same as specified for futures calendar spread. The margins for calendar spread shall be calculated on the basis of delta of the portfolio in each month. A portfolio consisting of a near month option with a delta of 100 and a far month option with a delta of –100 would bear a spread charge equal to the spread charge for a portfolio which is long 100 near month futures and short 100 far month futures. The benefit for a calendar spread would continue till expiry of the near month contract.

7.10.1.1.4 Margin on consolidated crystallized obligation

The margin on consolidated crystallized obligation in derivatives shall represent:

On Intra-day Basis	Payable crystallized obligations based on the closed-out futures positions and payable/receivable premium at client level.
At end-of-day basis	Payable obligations at client level considering all futures and options positions.

Intraday basis

On intraday basis, the net payable/receivable amount at client level shall be calculated using:

1. Premium payable/receivable
2. Futures crystallized profit or loss (calculated based on weighted average prices of trades executed).

If the overall amount at client level is payable, such amount shall be the intraday consolidated crystallized obligation margin for the client.

End-of-day basis

At the end of day, the payable/receivable amount at client level shall be calculated using:

1. Futures mark to market profit/loss to be settled
2. Options premium payable/receivable

3. Options exercise/assignment for expired contracts
4. Futures final settlement for expired contracts

If the overall amount at client level is payable, such amount shall be the end of-day consolidated crystallized obligation margin for the client. The margin on consolidated crystallized obligations shall be released on completion of settlement.

The margin on consolidated crystallized obligations has replaced the net buy premium, intraday crystallized losses, assignment margin and futures final settlement margin levied.

7.10.1.2 Extreme Loss Margin

Clearing members shall be subject to extreme loss margins in addition to initial margins:

Product	ELM: Futures	ELM: Options
Cash settled Interest Rate Derivatives on G-Sec	0.25%	0.25%
Futures on 91 Day GOI T-bills	0.015%	NA
Overnight Call rate (MIBOR)	0.50%	NA

Notes:

1. In case of calendar spread positions in 91-Day GOI T-bill futures extreme loss margin will be 0.01% of the notional value (Rs 200000) of the far month contract. In case of calendar spread positions, of cash settled IRF on G-Sec, extreme loss margin will be 0.01% of the value of the far month contract.
2. The applicable extreme loss margin for futures shall be calculated on the mark to market value of the gross open positions
3. In case of options extreme loss margin shall be calculated on the Notional Value of the open short option position.

Extreme Loss margin requirement shall be computed as under:

1. For client positions - shall be netted at the level of individual client and grossed across all clients, at the trading/ clearing member level, without any set-offs between clients.
2. For proprietary positions - shall be netted at trading/ clearing member level without any set-offs between client and proprietary positions.

The margins so computed shall be aggregated first at the trading member level and then aggregated at the clearing member level.

7.10.1.3 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.

Clearing members shall provide for margin in any one or more of the eligible collateral modes as detailed in section 7.10.2. The margins shall be collected /adjusted from the liquid assets of the member on a real time basis.

7.10.2 Liquid Assets & Liquid Networth

Liquid Net Worth

The Liquid Net Worth is defined as the total liquid assets deposited with the Exchange/Clearing Corporation towards initial margin and capital adequacy, LESS initial margin, and extreme loss/exposure margin applicable to the total gross open positions at any given point of time on all trades to be cleared through the clearing member.
The clearing member's liquid net worth shall not be less than Rs. 50 lacs at any point of time.

Liquid Assets

Clearing member may deposit liquid assets in the form of cash, bank guarantees, fixed deposit receipts, approved securities and any other form of collateral as may be prescribed by the Clearing Corporation from time to time.

These liquid assets are segregated as cash component and non-cash component. Cash component shall mean cash, bank guarantees, fixed deposit receipts, units of money market mutual fund, Gilt funds, Government of India Securities, Sovereign Gold Bonds and any other form of collateral as may be prescribed by the Clearing Corporation from time to time. Non-cash component shall mean all other forms of collateral deposits like deposit of approved list of demat securities, units of the other mutual funds and any other form of collateral as may be prescribed by the Clearing Corporation from time to time.

The liquid assets comprise of the cash component and the non-cash component wherein the cash component shall be at least 50% of liquid assets. This implies that non cash component in excess of the total cash component would not be regarded as part of liquid assets.

Item	**Haircut**	**Limits**
Cash Equivalents		
Cash	0	No limit
Bank fixed deposits (*)	0	No limit
Bank guarantees	0	Limit on Exchange's/Clearing Corporation exposure

Item	Haircut	Limits
		to a single bank (Refer Note)
Securities of the Central Government	Refer Note	No limit
Units of growth plans of overnight mutual fund scheme	5 percent	No limit
Units of overnight mutual fund schemes (other than growth plans), liquid mutual fund schemes or government securities mutual fund schemes (by whatever name called which invest in government securities)	10 percent	No limit
Foreign Sovereign Securities	The haircut may be either be a fixed percentage or VaR based	Value of the sovereign securities shall not be more than 10% of the total value of the cash component of the liquid assets of the clearing member.
Other liquid assets (Non-Cash Component) 1. Cannot be used for mark to market losses 2. Total of other liquid assets cannot exceed total of Cash Equivalents		
Equity shares with impact cost of up to 0.1% for an order value of Rs. 1 lakh and traded for at least 99% of days over the period of previous 6 months	VaR margin based on 6 sigma subject to minimum of 9%.	Limit on exposure to a single issuer. (Refer Note)
Units of Mutual fund schemes other than those listed under cash equivalents	VaR margin based on 6 sigma subject to minimum of 9%.	No limit
Corporate Bonds	Fixed percentage based or VaR based Haircut. A higher haircut may be considered to cover the expected time frame for liquidation. To begin with the haircut shall be	Not to exceed 10 percent of the total liquid assets of the clearing member. (Refer Note)

Item	Haircut	Limits
	a minimum of 10 percent.	

Note:

A. The valuation of the liquid assets shall be done on a daily basis after applying applicable haircuts.

B. Single Bank Exposure Limits

The exposure of CCs and its subsidiaries towards banks through Cash, FDs and BGs must be adequately diversified, and daily exposure to a single bank shall not exceed:

- 15% of the average daily exposure of previous three months considering all liquid assets of CCs, for banks with AAA rating; and
- 10% of the average daily exposure of previous three months considering all liquid assets of CCs, for banks with AA (include both AA and AA+) and above rating but below AAA.

At the end of every month, the average daily exposure of CC in liquid assets shall be calculated based on the exposure of previous three months. The single bank exposure limit for the next month would be based on this average daily exposure. The same shall be monitored on daily basis.

C. Mark to market losses shall be paid by the member in the form of cash or cash equivalents.

D. Cash equivalents shall be at least 50% of liquid assets. This would imply that Other Liquid Assets in excess of the total Cash Equivalents would not be regarded as part of Total Liquid Assets.

E. Exposure of CCs to equity and debt instruments (both bank and non-bank entities) through CMs may be subject to the following:

a. CCs shall devise well-defined criteria for exposure to equity and debt instruments through CMs (i.e. acceptance of collateral) in order to ensure adequate diversification, liquidity, etc.

b. The total exposure of the CC to equity and debt instruments of an issuer, received as collateral from CM in both cash and F&O segment (including commodity and currency derivatives segment) put together, shall not exceed 15% of total liquid assets of the CC received from CMs; and shall be treated as part of non-cash component of the total liquid assets of the CC.

F. Acceptance of Fixed Deposit Receipts (FDRs) by Clearing Corporations as Collaterals Clearing corporation shall not accept Fixed Deposit Receipts (FDRs) from trading/clearing

members as collateral, which are issued by the trading/ clearing member themselves or banks who are associate of trading/clearing member. Explanation - for this purpose, 'associate' shall have the same meaning as defined under Regulation 2(1) (b) of SECC Regulations 2018.

G. Haircut on securities of the Central Government[49]

Type and Tenor of Securities	**Haircut**
Treasury Bills and liquid Government of India Dated Securities having residual maturity of less than 3 years	2%
Liquid Government of India Dated Securities having residual maturity of more than 3 years	5%
For all other semi-liquid and illiquid government of India Dated Securities	10%

H. CCs shall ensure that the corporate bonds provided by a CM shall not exceed.

- 10% of the total liquid assets of the CM placed with CC, in case the unsupported long-term issuer rating or unsupported rating of long-term instruments of that issuer is AAA.
- 8% of the total liquid assets of the CM placed with CC, in case the unsupported long-term issuer rating or unsupported rating of long-term instruments of that issuer is AA and above but below AAA.
- Exposure for this purpose through equity and debt instruments shall be based on mark to market value of the securities less the applicable haircuts.
- In case of exposure to entities whose own rating or rating of any of its instruments has been downgraded subsequently from the rating criteria specified in paragraphs above, the CCs shall remove the exposure to such issuers at the earliest.

I. In case the equity security does not meet the liquid security criteria (as specified in the table above), the same needs to be replaced by the CM at the earliest. In case of passive breach in exposure limit for equity securities due to mark to market valuation, the CCs shall rebalance the excess exposure to the issuer within three months from such deviation.

J. CCs shall not accept the collaterals from CMs, which are acquired through bespoke transactions (i.e. the CM is the sole subscriber of such corporate debt issuances).

K. Only FPIs are permitted to offer foreign sovereign securities with AAA ratings.

[49] Circular No. SEBI/HO/MRD/DRMNP/CIR/P/2019/33 Dated February 21, 2019.

7.10.3 Risk Reduction Mode

Stock Exchanges / Clearing Corporation shall ensure that the stock brokers are mandatorily put in risk-reduction mode when specific percent (currently 90%) of the stock broker's collateral available for adjustment against margins gets utilized on account of trades that fall under a margin system. The risk reduction mode is applicable at trading member as well as clearing member level. Such risk reduction mode shall include the following:

- All unexecuted orders shall be cancelled once stock broker breaches 90 percent collateral utilization level.
- Only orders with Immediate or Cancel attribute shall be permitted in this mode.
- All new orders shall be checked for sufficiency of margins. Fresh order placed by member to reduce the open position will be accepted. Fresh order that increase the position shall be checked for the sufficiency of margin and order that do not satisfy the sufficiency of margins will be rejected.
- The stock-broker shall be moved back to the normal risk management mode as and when the collateral of the stock-broker is lower than percent utilization level specified by the clearing corporation from time to time (currently 85%).

Additionally, when the member is in risk reduction mode:

- Members shall not be allowed to place orders with custodial participant code.
- Client and Custodial Participant code modification shall not be permitted.

With implementation of "Segregation and monitoring of collateral at client level", for monitoring of the risk reduction mode (90% utilization or such applicable limit), the following procedure shall be adopted[50]:

- TM level risk reduction mode: Client margin in excess of 90% of the client collateral shall be identified for each client under a TM. The total of such client margin in excess of 90% of the client collateral, plus the proprietary TM margin shall be assessed against the TM proprietary collateral for monitoring of TM level risk reduction mode.
- CM level risk reduction mode: Sum of client margin in excess of 90% of the client collateral for each client under a TM plus the proprietary TM margin, in excess of 90% of TM proprietary collateral shall be calculated as TM margin in excess of 90% of TM collateral. Sum of such margin for each TM clearing through a CM, plus sum of client margin in excess of 90% of the client collateral for each client clearing through such CM, plus the proprietary CM margin shall be assessed against the proprietary CM collateral for monitoring of CM level risk reduction mode.

[50] https://www.sebi.gov.in/legal/circulars/jul-2021/segregation-and-monitoring-of-collateral-at-client-level_51265.html

7.11 Margin Collection by Clearing Corporation

- The initial margin and extreme loss margins shall be payable upfront by the clearing members. Clearing/Trading members are required to collect initial margins and extreme loss margins from their client/constituents on an upfront basis.

- Clearing members shall provide for margin in any one or more of the eligible collateral modes as detailed in section "Liquid Asset".
- Clearing member can deposit the liquid asset in combination of various liquid assets in a manner and within a limit as specified by clearing corporation from time to time.
- Clearing members shall be permitted to provide "own" securities or trading member proprietary securities or client securities towards the margin deposit requirements.
- Clearing members can re-pledge client/trading member (TM) proprietary securities only through Margin Pledge facility provided by NSDL and CDSL.
- Clearing Member shall ensure that sufficient collateral is allocated to TM Prop/Custodian Participant (CP)/Clients to cover their margin requirements. However, if the margin applicable at clearing corporation for a TM Prop/CP/Client in a segment exceeds the collateral allocated to the TM Prop/CP/Client plus the securities collateral re-pledged to CC in the respective segment., then the proprietary collateral of TM/CM shall be locked. Such margin blocked from the proprietary collateral towards a TM Prop/CP/Client margin shall have deemed allocation of TM's proprietary collateral towards client's margin and deemed allocation of CM's proprietary collateral towards TM Prop/CP/Client margins.
- CM shall ensure that allocated collateral plus value of securities collateral repledge to Clearing Corporation for a TM Prop/CP/Client is all time greater than or equal to minimum margin collection requirement for respective TM Prop/CP/Client in the respective segment.
- CC's also provide facility to enable clearing members to transfer collaterals from one segment to another segment on an intraday basis.
- CC's also provide facility to release of collateral intra-day as well as at EOD.

7.11.1 Margin Payment

The clearing member is required to pay upfront margin to the clearing corporation as specified by clearing corporation / SEBI from time to time. Clearing members shall provide for margin in any one or more of the eligible collaterals as specified by clearing corporation from time to time. The margins shall be collected /adjusted from the liquid assets of a clearing member on a real time basis. SEBI vide circular dated July 20, 2021, advised Segregation and Monitoring of Collateral at Client Level. With a view to providing visibility of client-wise collateral (for each client) at all levels, viz., TM, CM and Clearing Corporation (CC), a reporting mechanism, covering both cash and non-cash collateral, shall be specified by the CCs. TM shall report disaggregated information on collaterals up to the level of its clients to the CM. CM shall report disaggregated information on collaterals up to the level of clients of TM and proprietary collaterals of the TMs to the

Stock Exchanges (SEs) and CCs in respect of each segment. On receipt of a trade from a client account by the CC, the margin shall first be blocked from the value of the client collateral. If the client collateral is not sufficient, the residual margin shall be blocked from the TM proprietary collateral of the TM of such client. If the TM proprietary collateral is also not sufficient, then the residual margin shall be blocked from the CM proprietary collateral of the CM of such TM.

Non-fulfilment of either whole or part of the margin obligations by clearing member will be treated as a violation of the rules, bye-laws and regulations of the clearing agency and will attract penalty. In addition, the clearing agency may at its discretion and without any further notice to the clearing member, initiate other disciplinary action, inter-alia including, withdrawal of trading facilities and/or clearing facility, close out of outstanding positions, imposing penalties, collecting appropriate deposits, invoking bank guarantees/ fixed deposit receipts, etc.

7.11.2 Margins from Client

Trading Members/Clearing Members should have a prudent risk management system to protect themselves against the default made by their clients. Margins constitute an important element of risk management systems and are required to be well documented and made accessible to the clients and the Stock Exchanges.

In case of Currency Derivatives segment (ETIRD is part of CDS), it is mandatory for Trading Members to collect initial margin and extreme loss margins from their client on an upfront basis. It must be ensured that all upfront margins are collected in advance of trade. Margin on consolidated crystallized obligation shall be collected from clients by T+1 day.

TMs/CMs shall report to the Stock Exchange up to T+5 working days the actual short-collection/ non-collection of all margins from clients.

The TM/CM can collect the margin from its client in a various form as specified by SEBI/Exchanges/Clearing Corporation from time to time after taking into account their risk management policy and liquidity aspects. SEBI vide circular dated February 2020 has provided guidelines for acceptance of collateral by TM/CM from client in the form of securities by way of Pledge/ Re-pledge in the Depository System. Salient features of the same are given in subsequent section of this chapter. Further, transfer of securities by client to the demat account of the TM / CM for margin purposes (i.e., title transfer collateral arrangements) is prohibited. SEBI also provided "Framework to Enable Verification of Upfront Collection of Margins from Clients in Cash and Derivatives segments.[51] Stock Exchange/Clearing Corporation shall levy penalty to TM/CM for short collection/non-collection of margins. All instances of non-reporting shall amount to 100% short collection and the penalty as applicable shall be charged on these instances in respect of short collection. If during inspection it is found that a member has reported

[51] SEBI/HO/MRD2/DCAP/CIR/P/2020/127 dated July 20, 2020

falsely the margin collected from clients, the member shall be penalized 100% of the falsely reported amount along with suspension of trading for 1 day in that segment.

'Mechanism for regular monitoring of and penalty for short collection/ non-collection of margins from clients' in Cash and Derivatives segments.

With an objective to enable uniform verification of upfront collection of margins from clients by TM/ CM and levy of penalty across segments, SEBI has provided following framework to the Stock Exchanges/ Clearing Corporations:

Clearing Corporations shall send minimum four snapshots of client wise margin requirement to TMs/CMs for them to know the intraday margin requirement per client in each segment. The number of times snapshots need to be sent in a day may be decided by the respective Clearing Corporation depending on market timings subject to a minimum of four snapshots in a day. The snapshots would be randomly taken in pre-defined time windows.

The client wise margin file (MG-12/13) provided by the CCs to TMs/CMs shall contain the EOD margin requirements of the client as well as the peak margin requirement of the client, across each of the intra-day snapshots.

The member shall have to report the margin collected from each client, as at EOD and peak margin collected during the day, in the following manner:

EOD margin obligation of the client shall be compared with the respective client margin available with the TM/CM at EOD.

AND

Peak margin obligation of the client, across the snapshots, shall be compared with respective client peak margin available with the TM/CM during the day.

Higher of the shortfall in collection of the margin obligations as above, shall be considered for levying of penalty as per the extant framework.

The verification of availability of margins with TM/ CM, as above, shall be done by exchanges/ clearing corporations on a weekly basis by verification of the balances in the books/ ledgers of the TM/ CM in respect of the client.

The margin requirements to be considered for the intra-day snapshots in derivatives segments (including commodity derivatives), shall be calculated based on the fixed Beginning of Day (BOD) margin parameters. The BOD margin parameters would include all SPAN margin parameters as well as ELM requirements.

With effect from May 01, 2023, the End of Day (EOD) margin collection requirement from clients, in derivatives segments (including commodity derivatives), shall also be calculated based on the fixed BOD margin parameters.

7.11.3 Providing margin related information to clients

Stock Brokers should send margin related information across all segments to their clients, which shall, inter-alia, include:

- Client code and name, Trade day (T)
- Margin deposit available for the client on day T (with break-up in terms of cash, FDRs, BGs and pledged/re-pledged securities)
- Margin adjustments (including MTM losses) for day T after adjusting MTM profit, if any.
- Margin status (balance with the member / due from the client) at the end of T day.

Such margin related information (Daily margin statement) should be issued by Stock Brokers to clients on T-Day itself or by such timelines as may be specified from time to time.

Brokers should maintain proper records of client collateral and to prevent misuse of client collateral:

- Brokers should have adequate systems and procedures in place to ensure that client collateral is not used for any purposes other than meeting the respective client's margin requirements/pay-ins. Brokers should also maintain records to ensure proper audit trail of use of client collateral.
- Additionally, every Stock Broker shall maintain proper records of collateral received from clients as under:
    - Receipt of collateral from client and acknowledgement issued to client on receipt of collateral
    - Client authorization for deposit of collateral with the exchange/ clearing corporation/ clearing house towards margin
    - Record of deposit of collateral with exchange/ clearing corporation/ clearing house
    - Record of return of collateral to client
    - Credit of corporate action benefits to clients
- The records should be periodically reconciled with the actual collateral deposited with the broker.

In case client collateral is found to be mis-utilized, the broker would attract appropriate deterrent penalty for violation of norms provided under Securities Contract Regulation Act, SEBI Act, SEBI Regulations and circulars, Exchange Byelaws, Rules, Regulations and circulars.

Stock-Broker/Clearing Members should have a prudent risk management system to protect themselves against the default made by their clients. Margins constitute an important element of risk management systems and are required to be well documented and made accessible to the clients and the Stock Exchanges.

7.11.4 Mechanism for Client Collateral

In order to strengthen the mechanism of protection of client collateral from misappropriation/ misuse by TM/ CM, default of TM/CM and/or other clients and upfront collection of margins from clients SEBI has issued various measures like:

1. Margin obligations to be given by way of Pledge/ Re-pledge in the Depository System[52]. Salient features are given below:
   - Collateral from clients in the form of securities is allowed only by way of 'margin pledge', created in the Depository system
   - Procedure provided by depositories for the manner of creating pledge of the dematerialized securities should be followed. Any other procedure for creating pledge is prohibited.
   - It is clarified that an off-market transfer of securities leads to change in ownership and shall not be treated as pledge. Transfer of securities to the demat account of the TM / CM for margin purposes (i.e., title transfer collateral arrangements) is prohibited.
   - Depositories provides a separate pledge type viz. 'margin pledge', for pledging client's securities as margin to the TM / CM. The TM / CM shall open a separate demat account for accepting such margin pledge, which shall be tagged as 'Client Securities Margin Pledge Account'.
   - For the purpose of providing collateral in form of securities as margin, a client shall pledge securities with TM, and TM shall re-pledge the same with CM, and CM in turn shall re-pledge the same to Clearing Corporation (CC). The complete trail of such re-pledge shall be reflected in the de-mat account of the pledgor.
   - In client account, margin pledge or re-pledge shall be reflected against each security, if it is pledged / re-pledged and in whose favour i.e., TM / CM / CC.
   - The TM shall re-pledge securities to the CM's 'Client Securities Margin Pledge Account' only from the TM's 'Client Securities Margin Pledge Account'. The CM shall create a re-pledge of securities on the approved list to CC only out of 'Client Securities Margin Pledge Account'.
   - In this context, re-pledge would mean endorsement of pledge by TM / CM in favour of CM/CC, as per procedure laid down by the Depositories
   - The TM and CM shall ensure that the client's securities re-pledged to the CC shall be available to give exposure limit to that client only.
   - Securities that are not on the approved list of a CC may be pledged in favour of the TM / CM. Each TM / CM may have their own list of acceptable securities that may be accepted as collateral from client.
   - CM shall be allowed to re-pledge acceptable/approved client securities with the CC by furnishing the UCC wise client details. CC shall not allow any exposure to the CM on re-pledged securities of the client / TM.

[52] SEBI circular SEBI/HO/MIRSD/DOP/CIR/P/2020/28 dated February 25, 2020

- In case of a trade by a client / TM whose securities are re-pledged with CC, the CC shall first block the available collateral provided by CM. However, at periodical interval (latest by end of day), CC shall release the blocked securities collateral of CM to the extent of re-pledged securities collateral of that client / TM available with the CC.

2. Execution of 'Demat Debit and Pledge Instruction' (DDPI) for transfer of securities towards deliveries / settlement obligations and pledging / re-pledging of securities.[53] The DDPI shall serve the same purpose of Power of Attorney (PoA) and significantly mitigate the misuse of PoA.

3. Framework to enable verification of upfront collection of margins from clients in Cash and Derivatives segments[54]:
   The guideline reiterated that the applicable upfront margins are required to be collected from the clients in advance of the trade. With an objective to enable uniform verification of upfront collection of margins from clients by TM/ CM and levy of penalty across segments, SEBI has specified framework to the Stock Exchanges/ Clearing Corporations for the purpose of 'Mechanism for regular monitoring of and penalty for short-collection/ non-collection of margins from clients' in Cash and Derivatives segments.

4. Segregation and Monitoring of Collateral at Client Level[55]. Salient features are given below:
   - With a view to providing visibility of client-wise collateral (for each client) at all levels, viz., TM, CM and Clearing Corporation (CC), a reporting mechanism, covering both cash and non-cash collateral, shall be specified by the CCs.
   - TM shall report disaggregated information on collaterals up to the level of its clients to the CM.
   - CM shall report disaggregated information on collaterals up to the level of clients of TM and proprietary collaterals of the TMs to the Stock Exchanges (SEs) and CCs in respect of each segment.
   - A web portal facility shall be provided by the CCs/ SEs to allow clients to view aforesaid disaggregated collateral reporting by TM/CM.
   - The CCs shall provide a facility to CMs for upfront segment-wise allocation of collateral to a TM/ client or CM's own account. The CCs shall use such collateral allocation information to ensure that the collateral allocated to a client is used towards the margin obligation of that client only.

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[53] https://www.sebi.gov.in/legal/circulars/apr-2022/execution-of-demat-debit-and-pledge-instruction-ddpi-for-transfer-of-securities-towards-deliveries-settlement-obligations-and-pledging-re-pledging-of-securities_57546.html

[54] SEBI circular SEBI/HO/MRD2/DCAP/CIR/P/2020/127 dated July 20, 2020, SEBI/HO/MRD2/DCAP/P/CIR/2022/60 dated May 10, 2022 and SEBI/HO/MRD/MRD-PoD-2/P/CIR/2023/016 dated February 01, 2023

[55] SEBI circular SEBI/HO/MRD2_DCAP/CIR/2021/0598 dated July 20, 2021

- There shall be no change in the procedures pertaining to placing of securities as collateral through the margin pledge/re-pledge mechanism in the Depository system, and this collateral will be identified as belonging to a client or as being proprietary securities of the TM or CM, as the case may be, as per the existing procedures.
- While depositing other forms of collateral i.e. Cash, Fixed Deposits (FDs), Bank Guarantees (BGs) or Government Securities provided through the SGL/CSGL route, etc., the CM shall allocate these collaterals into proprietary account of CM, and/or proprietary account of any TM clearing through the CM, and/or account of any of the clients(including Custodial Participants(CPs)) clearing through the CM, and/or of any of the clients trading through the TM who in turn is clearing through the CM, segment-wise.
- In case of such collateral received by the CM from any TM, the CM shall not accept the same without the TM specifying break-up of such collateral into proprietary account of the TM and/or uniquely identified client account. Similarly, the CC shall not accept such collateral without the CM specifying appropriate break-up of such collateral into proprietary account of CM/ proprietary account of TM/ client account. The CM shall ensure that the sum of break-up of such collateral provided by TM is equal to the total value of such collateral provided by TM, and that the allocation of such collateral to any entity as reported to the CC does not exceed the allocation of collateral reported by the TM for that entity.
- The members shall ensure that allocated collateral plus value of securities collateral re-pledged to the CC for a client is at all times greater than or equal to the minimum margin collection requirement for the respective client in the respective segment.
- CMs are required to maintain at least 50% of the total collateral in the form of cash or cash equivalents. At individual client level, a client may have allocation of cash equivalent, less than the value of non-cash collateral provided by the client. In other words, the minimum 50% cash equivalent collateral requirement may not be applied at the client level. For the purpose of monitoring of at least 50% cash-equivalent collateral at the level of CM, the excess cash-equivalent collateral of a client shall not be considered for other client or for proprietary account of TM/CM. However, the excess cash-equivalent collateral of proprietary account of TM/CM can be considered for clients trading/clearing through them, for the purpose of monitoring minimum 50% cash-equivalent requirement.
- The terms “Client Collateral”, “TM Collateral”, “CP Collateral” and “CM Collateral” shall mean the total of the allocated collateral value plus the value of demat securities collateral provided through margin pledge/re-pledge by any individual client, TM, CP and CM respectively to the level of CC. The TM/CM collateral shall mean the proprietary collateral of the TM/CM only and shall not include the collateral of any of their clients.
- On receipt of a trade from a client account by the CC, the margin shall first be blocked from the value of the client collateral. If the client collateral is not

sufficient, the residual margin shall be blocked from the TM proprietary collateral of the TM of such client. If the TM proprietary collateral is also not sufficient, then the residual margin shall be blocked from the CM proprietary collateral of the CM of such TM.

- In case of a trade from the proprietary account of a TM, the margin shall first be blocked from the TM proprietary collateral, and in case such collateral is not sufficient, then the residual margin shall be blocked from the CM proprietary collateral.
- Margins based on trades from proprietary account of the CM shall be blocked from the proprietary collateral of the CM only.
- In case of CP trades executed by TMs, the margin shall be blocked in the following order- (i) CP collateral through the executing TM, if any, (ii) residual margin from the proprietary collateral of the executing TM, and (iii) residual margin from the proprietary collateral of the CM of the executing TM. Upon confirmation of such trades by CM of the CP, the margin so blocked prior to the confirmation shall be released, and shall be blocked in the following order- (i) CP collateral through the confirming CM, and (ii) residual margin from the proprietary collateral of the confirming CM. In case of CP trades, the requirement to ensure that sufficient collateral is allocated to clients to cover their margin requirements shall be on the confirming CM. However, if the trade is confirmed under the auto approval facility provided by the CC, then margin shall be directly blocked in the following order- (i) CP collateral through the confirming CM, and (ii) residual margin from the proprietary collateral of the confirming CM.
- CMs shall be permitted to change the allocation of collateral deposited with the CC, subject to the value allocated to any client not exceeding the value of actual collateral received from that client (excluding the securities collateral re-pledged to CC through margin pledge mechanism).

For additional details participants are requested to refer the relevant circulars.

5. Upstreaming of clients' funds by Stock Brokers (SBs) / Clearing Members (CMs) to Clearing Corporations (CCs)[56]

With a view to safeguard clients' funds placed with SBs/CMs, SEBI has decided the upstreaming of all client funds received by SBs/CMs to the Clearing Corporations (CCs). As per the framework, no clients' funds shall be retained by SBs/ CMs on End of Day (EoD) basis. The clients' funds shall all be upstreamed by SB/ CMs to CCs only in the form of either cash, lien on FDR (subject to certain conditions enumerated below), created out of client fund or pledge of units of Mutual Fund Overnight Schemes (MFOS) created out of clients fund. FDRs created by SBs/ CMs out of clients' funds shall be allowed only under certain conditions. SBs/CMs shall ensure that client funds are invested only in such MFOS that deploy funds into risk-free government

[56] https://www.sebi.gov.in/legal/circulars/dec-2023/upstreaming-of-clients-funds-by-stock-brokers-sbs-clearing-members-cms-to-clearing-corporations-ccs-_79788.html .

bond overnight repo markets and overnight Tri-party Repo Dealing and Settlement (TREPS). The bank instruments provided by clients as collateral (i.e. client FDRs and BGs) cannot be upstreamed to CCs, and they shall be ineligible to be accepted as collateral in any segment of securities market. The provisions of this framework shall not be applicable to bank-CMs (including Custodians that are banks), and for proprietary funds of SBs/CMs in any segment and SB's proprietary funds deposited with CM in the capacity of a client.

For additional details participants are requested to refer the relevant circulars.

6. Trading supported by Blocked Amount in Secondary Market[57]

In its continuing endeavour to provide protection to the investors from the default of member(s) ['trading member' (TM) / 'clearing member' (CM)] SEBI has decided to introduce a supplementary process for trading in secondary market based on blocked funds in investor's bank account, instead of transferring them upfront to the trading member, thereby providing enhanced protection of cash collateral. The said facility shall be provided by integrating Reserve Bank of India (RBI) approved Unified Payments Interface (UPI) mandate service of single-block-and-multiple-debits with the secondary market trading and settlement process and hereinafter referred as 'UPI block facility'.

Under the proposed framework, funds shall remain in the account of client but will be blocked in favour of the clearing corporation ('CC') till the expiry date of the block mandate or till block is released by the CC, or debit of the block towards obligations arising out of the trading activity of the client, whichever is earlier. Further, settlement for funds and securities will be done by the CC without the need for handling of client funds and securities by the member.

For additional details participants are requested to refer the relevant circulars.

7.12 Core Settlement Guarantee Fund

Securities Contracts (Regulation) (Stock Exchanges and Clearing Corporations) Regulations, 2018, inter-alia, state the following:

1) Every recognized clearing corporation shall establish and maintain a Fund by whatever name called, for each segment, to guarantee the settlement of trades executed in respective segment of a recognized stock exchange.

(2) In the event of a clearing member failing to honour his settlement obligations, the Fund shall be utilized to complete the settlement.

(3) The corpus of the Fund shall be adequate to meet the settlement obligations arising on account of failure of clearing member(s).

[57] https://www.sebi.gov.in/legal/circulars/jun-2023/trading-supported-by-blocked-amount-in-secondary-market_73071.html, https://www.sebi.gov.in/legal/circulars/nov-2024/trading-supported-by-blocked-amount-in-secondary-market_88339.html

(4) The sufficiency of the corpus of the Fund shall be tested by way of periodic stress tests, in the manner specified by SEBI.
(5) The utilization of the Fund shall be in accordance with the norms specified by SEBI.

Further, SEBI has directed clearing corporation to have a fund called Core SGF (Settlement Guarantee Fund) for each segment of each Recognized Stock Exchange (SE) to guarantee the settlement of trades executed in respective segment of the Stock Exchange.[58] In the event of a clearing member (member) failing to honour settlement commitments, the Core SGF shall be used to fulfil the obligations of that member and complete the settlement without affecting the normal settlement process.

7.12.1 Corpus of Core SGF

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. While deciding on the fair quantum of the corpus of the SGF, the CC should consider the following factors:

- Risk management system in force.
- Current and projected volume/turnover to be cleared and settled by the CC on a guaranteed basis.
- Track record of defaults of members (number of defaults, amount in default).

A Minimum Required Corpus (MRC) of the core SGF should be created subject to the following conditions:

i. The MRC shall be fixed for a month.
ii. By 15th of every month, CC shall review and determine the MRC for next month based on the results of daily stress tests of the preceding month.
iii. CC shall also review and determine by 15th of every month the adequacy of contributions made by various contributors and any further contributions to the Core SGF required to be made by various contributors for the next month.
iv. For every day of the preceding month, uncovered loss numbers shall be estimated by the various stress tests for credit risk conducted by the CC for the segment and the highest of such numbers shall be taken as worst-case loss number for the day.
v. Average of all the daily worst case loss numbers determined in (iv) above shall be calculated.
vi. The MRC for next month shall be higher of the average arrived at as (v) above and the segment MRC as per previous review.

7.12.2 Contribution to Core SGF

Contributions of various contributors to Core SGF of any segment shall be as follows:

[58] https://www.sebi.gov.in/sebi_data/attachdocs/1409136206919.pdf

a) *Clearing Corporation Contribution:* CC contribution to Core SGF shall be at least 50 percent of the MRC which should be from its own funds. CC contribution to core SGF shall be considered as part of its net worth.
b) *Stock Exchange Contribution:* Stock Exchange contribution to Core SGF shall be at least 25 percent of the MRC (can be against transfer of profits by Exchange as per Regulation 33 of SECC Regulations).
c) *Clearing Member Primary Contribution:* The total contribution from members to core SGF for each segment will not be more than 25% of MRC of the respective segment. No exposure shall be available to CMs on their contribution to core SGF. The required contributions of individual CMs shall be assessed pro-rata based on the risk they bring to the system. CC shall have the flexibility to collect CM primary contribution either upfront or staggered over a period of time. In case of staggered contribution, the remaining balance shall be met by CC to ensure adequacy of total Core SGF corpus at all times. Such CC contribution shall be available to CC for withdrawal as and when further contributions from CMs are received. As per SEBI circular number SEBI/HO/MRD/DRM/NP/CIR/P/2016/54 dated May 04, 2016, the clearing member contribution to core SGF shall be met to the extent available from the amount received from Exchange.
d) Any penalties levied by CC shall be credited to Core SGF corpus.
e) Interest on cash contribution to Core SGF shall also accrue to the Core SGF and pro-rata attributed to the contributors in proportion to their cash contribution.

SEs are allowed to transfer excess contribution made by them from Core SGF of one CC to the Core SGF of another CC, in inter-operable scenario.

Further contribution to / Recoupment of Core SGF[59]

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. The period of 30 calendar days shall commence from the date of notice of default by Clearing Corporation to market participants. In case there is failure on part of some contributor(s) to replenish its (their) contribution, same shall be immediately met, on a temporary basis during the month, in the following order: (i) By CC (ii) By SE
CC shall ordinarily accept cash collateral for Core SGF contribution. However, CC may accept CM contribution in the form of bank FDs, Central Government securities or as specified by SEBI from time to time in this regard.

[59] SEBI Circular Ref. No. SEBI/HO/MRD2/DCAP/CIR/P/2020/01 Dated January 03, 2020.

Access to Core SGF

The Regulatory Oversight Committee ("ROC") of the CC shall manage the Core SGF. CC may utilize the Core SGF in the event of a failure of member(s) to honour settlement commitment.

7.12.3 Default Waterfall

In the event of a default, the utilization of the Settlement Guarantee Fund shall generally follow the following order:

a) Monies of defaulting member (including defaulting member's primary contribution to Core SGF(s) and excess monies of defaulter in other segments).
b) Insurance, if any.
c) CC resources (equal to 5% of the segment MRC).
d) Core SGF of the segment in the following order:
    I. Penalties
    II. CC contribution to the extent of at least 25% of the segment MRC
    III. Remaining Core SGF: CC contribution, Stock Exchange contribution and non-defaulting members' primary contribution to Core SGF on pro-rata basis.
e) Proportion of remaining CC resources (excluding CC contribution to core SGFs of other segments and Rs. 100 Crore) equal to ratio of segment MRC to sum of MRCs of all segments. Rs. 100 Crore to be excluded only when remaining CC resources (excluding CC contribution to core SGFs of other segments) are more than Rs. 100 Crore.
f) CC/SE contribution to Core SGFs of other segments (after meeting obligations of those segments) and remaining CC resources to that extent as approved by SEBI.
g) Capped additional contribution by non-defaulting members of the segment.[60]
h) Any remaining loss to be covered by way of pro-rata haircut to pay-outs.

7.12.4 Stress testing and back testing

CC should effectively measure, monitor, and manage its credit exposures to its participants and those arising from its payment, clearing, and settlement processes by 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'

[60] For further details, refer SEBI Circular Ref. No. SEBI/HO/MRD2/DCAP/CIR/P/2020/01 Dated January 03, 2020. The maximum capped additional contribution by non-defaulting members shall be lower of 2 times of their primary contribution to Core SGF or 10% of the Core SGF of the segment on the date of default in case of equity/ debt segments. The maximum capped additional contribution by non-defaulting members shall be lower of 2 times of their primary contribution to Core SGF or 20% of the Core SGF of the segment on the date of default in case of derivatives segment.

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. Such scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons and a spectrum of forward looking stress scenarios in a variety of extreme but plausible market conditions.

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 (e.g., simultaneous default of top N members or N% movement in price of top 2 scrips by turnover or 20% movement in price of top N scrips by turnover etc.)

Back testing for adequacy of margins: CC shall daily conduct back testing of the margins collected vis-à-vis the actual price changes for the contracts being cleared and settled in every segment to assess appropriateness of its margining models

Adequacy of financial resources: CC shall continuously monitor the adequacy of financial resources (as available in its default waterfall) against the uncovered loss estimated by the various stress tests conducted by the CC and take steps to beef up the same in case of shortfall.

At least on a monthly basis, CC shall perform a comprehensive and thorough analysis of stress testing scenarios, models, and underlying parameters and assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. CC shall perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CC's participants increases significantly. A full validation of CC's risk-management model shall be performed at least annually. The results of tests carried out above shall be monitored by the Risk Management Committee of the CC and the same should be communicated for discussion and review by the Board of the CC.

Sample Questions

1. In the clearing corporation, clearing is carried out by a process called _____ netting.
    a. **Multilateral**
    b. Closed
    c. Open
    d. Gross

2. Interoperability of clearing corporation framework is allowed for all the products available in the Indian securities markets, EXCEPT: _____.
    a. **Commodity Derivatives**
    b. Interest rate derivatives
    c. Index Derivatives
    d. Index Options

3. Daily Mark to market settlement of Exchange traded interest rate future contract is _____.
    a. **Cash settled**
    b. Adjusted to liquid asset
    c. Both (a) & (b) above
    d. None of the above

4. _____ are the maximum exposure levels which the entire market can go up to and each trading member or investor can go up to.
    a. Open interest
    b. Value at Risk
    c. **Position limits**
    d. Price bands

5. As a Risk Reduction Measure, all unexecuted orders shall be cancelled once stock broker breaches _____ collateral utilization level.
    a. **90 percent**
    b. 75 percent
    c. 50 percent
    d. None of the above

CHAPTER 8: REGULATORY FRAMEWORK FOR EXCHANGE TRADED INTEREST RATE DERIVATIVES

LEARNING OBJECTIVES:

After studying this chapter, you should know about following:

- Role of RBI-SEBI Standing Technical Committee
- SEBI and RBI Regulations on ETIRD
- Regulatory Guideline on Participation of Various Entities
- Eligibility Criteria for Membership of ETIRD

Introduction

The regulators in the Indian securities market ensures that the market participants behave in a desired manner so that securities market continue to be a major trusted source of finance for corporate and Government and the interest of investors are protected. The different regulators who regulate the activities of the different sectors in the financial market are as given below:

- SEBI regulates the securities market and the commodity derivatives market.
- Reserve Bank of India (RBI) is the authority to regulate and monitor the banking sector.
- Insurance Regulatory and Development Authority of India (IRDAI) regulates the insurance sector.
- Pension Fund Regulatory and Development Authority (PFRDA) regulate the pension fund sector.
- International Financial Services Centres Authority (IFSCA) is a unified authority for the development and regulation of financial products, financial services and financial institutions in the IFSC in India.
- Ministry of Finance (MOF)
- Ministry of Corporate Affairs (MCA)

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. The following shows the summary of statutory regulations and operational rules.

Entity	Authority/Statute	Scope
RBI	Government Securities Act 2006	All dealings in government securities

Entity	Authority/Statute	Scope
	Reserve Bank of India Act 1934; and Banking Regulation Act 1949	All dealings by RBI-supervised entities; Dealing in rupee interest rate derivatives
SEBI	Securities Contract (Regulation) Act 1956; and SEBI Act 1992	All exchange-traded contracts
Exchanges/Clearing Corporation	Bye-laws of the Exchange and CCs	Operational rules and procedures for trading, clearing, settlement & risk management
Depositories	Depositories Act 1996	Demat accounts

RBI's role in regulation of government securities is primary and fundamental and covers all activities while that of SEBI is limited to the Exchange-traded contracts on them.

8.1 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. It gives Central Government the regulatory jurisdiction over-

(a) Stock Exchanges through a process of recognition and continued supervision

(b) Contracts in securities, and

(c) Listing of securities on Stock Exchanges

The term "**Securities**" as defined in the SCRA, 1956 includes the following:

i. Shares, scrips, stocks, bonds, debentures, debenture stock or other marketable securities of a like nature or of any incorporated company or a pooled investment vehicle other body corporate;
ii. Derivatives;
iii. Units or any other instrument issued by any Collective Investment Scheme;
iv. Security receipt as defined in the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002;
v. units or any other instrument issued by any pooled investment vehicle;
vi. Units or any other such instrument issued to the investors under any mutual fund scheme; [61]
vii. Any certificate or instrument, issued to an investor by any issuer being a special purpose distinct entity which possesses any debt or receivable, including mortgage debt, assigned to such entity, and acknowledging beneficial interest of such investor in such debt or receivable, including mortgage debt, as the case may be;

[61] "Securities" shall not include any unit linked insurance policy or scrips or any such instrument or unit, by whatever name called, which provides a combined benefit risk on the life of the persons and investment by such persons and issued by an insurer referred to in clause (9) of section 2 of the Insurance Act, 1938 (4 of 1938);

viii. Government Securities
ix. Such other instruments as may be declared by the Central Government to be securities, and
x. Rights or interest in securities.

xi. "Electronic Gold Receipt" means an electronic receipt issued on the basis of deposit of underlying physical gold in accordance with the regulations made by the Securities and Exchange Board of India under section 31 of the said Act.

xii. Zero Coupon Zero Principal Instruments

With Securities Laws (Second Amendment) Act, 1999, Derivatives has been included in the definition of Securities. The term Derivative has been defined in Securities Contracts (Regulations) Act, 1956 as:
Derivative includes:
a. a security derived from a debt instrument, share, loan, whether secured or unsecured, risk instrument or contract for differences or any other form of security;
b. a contract which derives its value from the prices, or index of prices, of underlying securities;
c. commodity derivatives; and
d. such other instruments as may be declared by the Central Government to be derivatives;

Section 18A provides that notwithstanding anything contained in any other law for the time being in force, contracts in derivative shall be legal and valid if such contracts are:

- Traded on a recognized stock exchange
- Settled on the clearing house of the recognized stock exchange, in accordance with the rules and bye–laws of such stock exchanges.

8.2 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 on April 20, 2007, 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. With the expected benefits of exchange traded interest rate 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. To begin with, the Committee would evolve norms and oversee the implementation of Exchange traded currency futures.
The Terms of Reference to the Committee were as under:

- To coordinate the regulatory roles of RBI and SEBI in regard to trading of Currency and Interest Rate Futures on the Exchanges.
- To suggest the eligibility norms for existing and new Exchanges for Currency and Interest Rate Futures trading.
- To suggest eligibility criteria for the members of such exchanges.
- To review product design, margin requirements and other risk mitigation measures on an on-going basis
- To suggest surveillance mechanism and dissemination of market information.
- To consider microstructure issues, in the overall interest of financial stability.

The committee has submitted its report on Interest Rate Futures on June 17, 2009. The Report of RBI-SEBI Standing Technical Committee on Interest Rate Futures[62] is available on SEBI's website. With a view to operationalizing the Interest Rate Futures products, the Committee deliberated upon the recommendations of the Technical Advisory Committee Report on Interest Rate Futures of August 2008[63]. The same is available on RBI website. The Report of RBI-SEBI Standing Technical Committee on Interest Rate Futures has provided product design, margins and position limits for 10-Year Notional Coupon bearing Government of India (GOI) Security Futures. The report also recommended that the Interest Rate Derivative contracts shall be traded on the Currency Derivative Segment of a recognized Stock Exchange. The members registered by SEBI for trading in Currency/Equity Derivative Segment shall be eligible to trade in Interest Rate Derivatives also, subject to meeting the Balance Sheet networth requirement of Rs 1 crore for a trading member and Rs 10 crores for a clearing member. This report became the important point for the introduction of Exchange Traded Interest Rate Derivatives.

8.3 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), regulation on participation in ETIRD etc. RBI vide its notification No. FMRD.DIRD.20/2019 dated June 26, 2019, has issued "Rupee Interest Rate Derivatives (Reserve Bank) Directions, 2019" (updated as on August 08, 2022). This direction has superseded various Directions issued by RBI on Rupee Interest Rate Derivatives. These Directions is applicable to Rupee interest rate derivatives transactions undertaken on recognized stock exchanges and Over-the-Counter (OTC) markets, including on electronic trading platforms (ETPs). Important points related to ETIRD are given below:

1. Important Definition

- 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.

[62]https://www.sebi.gov.in/reports/reports/jun-2009/report-of-the-rbi-sebi-standing-technical-committee-on-interest-rate-futures_4627.html

[63] https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/86253.pdf

- 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.
- Interest Rate Option (IRO) is an option contract whose value is based on Rupee interest rates or interest rate instruments.
- Recognized stock exchanges shall have the meaning assigned under Section 2 (f) of the Securities Contract Regulation Act, 1956.
- Regulated entity means any person, other than an individual or HUF, whose activities are regulated by any one of the financial regulators in India viz., Reserve Bank of India (RBI), Securities and Exchange Board of India (SEBI), Insurance Regulatory and Development Authority of India (IRDAI), Pension Fund Regulatory and Development Authority (PFRDA), National Housing Bank (NHB) and National Bank for Agriculture and Rural Development (NABARD).
- Non-resident is a person resident outside India as defined in section 2 (w) of Foreign Exchange Management Act, 1999 (42 of 1999).
- Non-retail users shall include (a) entities regulated by the Reserve Bank; (b) insurance companies; (c) mutual funds, pensions funds and other collective investment vehicles; (d) All India Financial Institutions (AIFIs), viz., Exim Bank, NABARD, NHB and Small Industries Development Bank of India (SIDBI); and (e) companies/entities with net-worth of ₹5 billion or above.

2. Eligible Participants

(1) Any person resident in India and any non-resident, to the extent specified in these Directions, is eligible to participate in IRDs. All regulated entities shall participate in IRDs with the permission of and subject to the terms and conditions, if any, fixed by their respective regulators.

(2) Indian or non-resident parent company or any group company or centralized treasury can transact in IRDs on behalf of their wholly owned subsidiaries or group companies provided they meet the criteria for non-retail users.

3. Trading Venues

IRD contracts can be transacted either (i) on Recognized Stock Exchanges, or (ii) Over-the-Counter (OTC). OTC transactions shall refer to all transactions done outside of recognized stock exchanges and shall include transactions on Electronic Trading Platforms (ETPs). The directions governing activities in IRDs in each of these trading venues, viz., exchanges or OTC markets, are laid down separately.

4. Interest Rate Derivatives on Recognized Stock Exchanges

IRD transactions carried out on exchanges shall be subject to the following directions:

(a) Exchanges are permitted to offer any standardized Interest Rate Derivatives product.

(b) The product design, eligible participants and other details of the IRD product may be finalized by the exchanges.

(c) Exchanges shall obtain prior approval of the Reserve Bank before introducing any new IRD product or before carrying out modifications to an existing product.

5. Transactions by non-residents for the purpose of hedging interest rate risk

(a) A non-resident may undertake Rupee interest rate derivatives transactions in India to hedge its interest rate risk using any product transacted on recognized stock exchanges.

6. Transactions by non-residents for purposes other than hedging interest rate risk

Foreign Portfolio Investors (FPIs), collectively, may also transact in interest rate futures (IRF) up to a limit of net long position of INR 50 billion in terms of RBI circular No. FMRD.DIRD.6/14.03.001/2017-18 dated March 01, 2018.

7. Conditions applicable to IRDs on both exchanges and in the OTC market

(a) Exchanges shall ensure that clients participating on exchanges are adequately made aware of the risks associated with the derivative instrument.

(b) Accounting, valuation and capital requirement for IRDs 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.

The Reserve Bank of India (RBI) vide press release dated June 16, 2025 has issued the **Draft** Master Direction – RBI (Rupee Interest Rate Derivatives) Directions, 2025[64] under Section 45W of the RBI Act, 1934. The draft seeks to update and streamline the regulatory framework governing Rupee Interest Rate Derivatives (IRDs) in India.

Background and Objective of new Rupee IRD Direction

The extant regulatory framework for Rupee Interest Rate Derivatives (IRD) was issued in June 2019. Since then, there have been several new developments in the market including, *inter alia*, the emergence of new products as well as the participation of the non-residents in the market. Accordingly, a comprehensive review of the IRD Directions was undertaken, and the draft Directions have been prepared to align it with the market and other related developments. The reporting requirements under the Directions have also been rationalised to reduce compliance burden. Separately, a requirement for reporting of IRD transactions undertaken globally is proposed to be introduced with a view to enhancing transparency in the Rupee IRD market.

[64] https://www.rbi.org.in/Scripts/bs_viewcontent.aspx?Id=4663

8.4 SEBI regulation and guideline

SEBI Act, 1992

SEBI Act, 1992 provides for establishment of Securities and Exchange Board of India (SEBI) with statutory powers for

(a) Protecting the interests of investors in securities,

(b) Promoting the development of the securities market, and

(c) Regulating the securities market.

Its regulatory jurisdiction extends over corporates (who list or propose to list their securities) in the issuance of capital and transfer of securities, in addition to all intermediaries and persons associated with securities (more specifically the capital market) market. It can conduct enquiries, audits and inspection of all concerned and adjudicate offences under the Act. It has powers to register and regulate all market intermediaries and to penalize them in case of violations of the provisions of the Act, Rules and Regulations made thereunder. SEBI has full autonomy and authority to regulate and develop an orderly securities market.

In particular, it has powers for:

- Regulating the business in stock exchanges and any other securities markets.
- Registering and regulating the working of stock brokers, authorised person etc.
- Promoting and regulating self-regulatory organizations associated with Securities Markets.
- Prohibiting fraudulent and unfair trade practices.
- Calling for information from, undertaking inspection, conducting inquiries and audits of the stock exchanges, mutual funds and other persons associated with the securities market and intermediaries and self–regulatory organizations in the securities market.
- Performing such functions and exercising according to Securities Contracts (Regulation) Act, 1956, as may be delegated to it by the Central Government.

SEBI issues various rules, regulations, guidelines, circulars etc. The details of the same is available on SEBI website. Given below details of few Regulations/Acts which are also of high importance in the regulation of Indian Securities Markets:

- The Securities Contracts (Regulations) Rules, 1957
- Securities Contracts (Regulation) (Stock Exchanges and Clearing Corporations) Regulations, 2018
- SEBI (Stock Brokers) Regulations, 1992
- SEBI (Prevention of Insider Trading) Regulations, 2015
- Prevention of Money laundering Act, 2002
- SEBI (Prohibition of Fraudulent and Unfair Trade Practices relating to the Securities Market) Regulations 2003
- SEBI (Custodians) Regulations, 1996
- SEBI (Substantial Acquisition of Shares and Takeovers) Regulations, 2011

- SEBI {KYC (Know Your Client) Registration Agency} Regulations, 2011
- SEBI (Intermediaries) Regulations, 2008
- SEBI (Depositories & Participants) Regulations, 2018.

Though RBI has provided broad level guideline for participation of interest rate derivatives on Exchanges, SEBI plays major role in regulating, development of Exchange traded interest rate derivatives. SEBI guideline related to trading, clearing and settlement, risk management, surveillance, investor grievance and protection, fraudulent and unfair trade practices, stock broker regulations, KRA regulations, anti-money laundering etc. will be applicable for ETIRD.

Brief points on SEBI guideline/regulation related to Trading:

- The Interest Rate Derivative contracts shall be traded on the Currency Derivative Segment of a recognized Stock Exchange.
- Exchange shall submit the proposal for approval of the ETIRD contract to SEBI
- The members registered by SEBI for trading in Currency/Equity Derivative Segment shall be eligible to trade in Interest Rate Derivatives also, subject to meeting certain criteria
- SEBI has also allowed Banks, primary dealers to take membership of ETIRD
- Provide guideline on contract specification which includes trading hours, underlying instrument, contract size, contract cycle, price band, expiry date etc.
- Provide guideline on position limits for trading members, institutional clients and non-institutional clients
- Provide guideline on surveillance system to effectively monitor trading in such contracts.
- Provide guideline to ensure market integrity, protection of investors and smooth and orderly trading etc.

Brief points on SEBI guideline/regulation related to Clearing Corporation:

- Clearing Corporation / Clearing House: The Clearing Corporation / Clearing House of Interest Rate Derivatives shall be the same as for currency derivatives segment.
- SEBI has allowed interoperability of clearing corporations for currency derivatives segment which includes ETIRD
- Provided guideline on clearing and settlement which includes mode of settlement, daily and final settlement price, settlement cycle, etc.
- Provided guideline on risk management which includes margining mechanism, liquid net worth, Liquid Assets, MTM settlement etc.
- Core Settlement Guarantee Fund (CSGF) requirement. As ETIRD is part of CDS, CSGF of CDS is available for ETIRD.

8.5 Regulatory guideline on participation of various entities in ETIRD

Interest rate risk affects not only the financial sector, but also the corporate and household sectors. Banks, insurance companies, primary dealers and provident funds

bear a major portion of the interest rate risk on account of their exposure to government securities. Today, with a large stock of household financial savings on the assets side and an increasing quantum of housing loans on the liabilities side, interest rate risk is becoming increasingly important for the household sector as well. Hence, it is important there should be participation from all categories of investor in ETIRD.

RBI in "Rupee Interest Rate Derivatives (Reserve Bank) Directions, 2019" has given certain basic guideline about participation based on resident and non-resident of India as well as retail and non-retail users. Further is also mentioned that "All regulated entities shall participate in IRDs with the permission of and subject to the terms and conditions, if any, fixed by their respective regulators".

8.5.1 Banks & Primary Dealers[65]:

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 vide circular no. DBOD.No.BP.BC.86/21.04.157/2006-07 dated April 20, 2007, on Comprehensive Guidelines on Derivatives (as amended from time to time).
Similarly, stand-alone Primary Dealers are allowed to deal in IRD for both hedging and trading on own account and not on client's account.[66]

8.5.2 Mutual Funds

Mutual funds are allowed to participate in ETIRD. SEBI has provided guideline for mutual funds participation in derivatives and specific to ETIRD, the brief of the same is given below[67]:

- Mutual Fund schemes are permitted to undertake transactions in Forward Rate Agreements and Interest Rate Swaps with banks, PDs & FIs as per applicable RBI Guidelines. Mutual funds can also trade in interest rate derivatives through the Stock Exchanges subject to requisite disclosures in the SID.
- Mutual funds adhere to the norms for investment and disclosure provided for derivatives as per master circular of mutual funds.
- To reduce interest rate risk in a debt portfolio, mutual funds 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). The maximum extent of short position that may be taken in IRFs to hedge interest rate risk of the portfolio or part of the portfolio, is as per the formula given below:

[65] In 1995, the Reserve Bank of India (RBI) introduced the system of Primary Dealers (PDs) in the Government Securities (G-Sec) Market. The objectives of the PD system are to strengthen the infrastructure in G-Sec market, development of underwriting and market making capabilities for G-Sec, improve secondary market trading system and to make PDs an effective conduit for open market operations (OMO).
[66] RBI/2013-14/410 IDMD.PCD.09 /14.03.01/2013-14 December 19, 2013

[67] For additional details participant can refer SEBI master circular for Mutual Funds dated June 27, 2024.

(Portfolio Modified Duration * Market Value of the Portfolio)
(Futures Modified Duration * Futures Price / PAR)

- In case the IRF used for hedging the interest rate risk has different underlying security(s) than the existing position being hedged, it would result in imperfect hedging.
- Imperfect hedging using IRFs may be considered to be exempted from the gross exposure, up to maximum of 20% of the net assets of the scheme, subject to the following:
    - Exposure to IRFs is created only for hedging the interest rate risk based on the weighted average modified duration of the bond portfolio or part of the portfolio.
    - The correlation between the portfolio or part of the portfolio (excluding the hedged portions, if any) and the IRF is at least 0.9 at the time of initiation of hedge. In case of any subsequent deviation from the correlation criteria, the same may be rebalanced within 5 working days and if not rebalanced within the timeline, the derivative positions created for hedging shall be considered under the gross exposure.
    - At no point of time, the net modified duration of part of the portfolio being hedged should be negative.
    - The portion of imperfect hedging in excess of 20% of the net assets of the scheme should be considered as creating exposure and shall be included in the computation of gross exposure.
    - The basic characteristics of the scheme should not be affected by hedging the portfolio or part of the portfolio (including one or more securities) based on the weighted average modified duration.
- Mutual Funds adhere to other norms for investment and disclosure in derivatives as specified by SEBI from time to time.

8.5.3 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. The brief of the same is given below:

Insurance companies are allowed to use IRF for hedging for forecasted transactions:

a. Reinvestment of maturity proceeds of existing fixed income investments;
b. Investment of interest income receivable;
c. Expected policy premium income receivable on the Insurance Contracts which are already underwritten in Life and Pension & Annuity business in case of Life Insurers and General Insurance business in case of General Insurers.

The overriding principle of any use of the above listed derivatives is that they must be used for hedging purposes only to reduce the interest rate risk in the company. The company must be able to demonstrate that this principle is adhered to.

8.5.4 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
  - For purposes other than hedging, to the extent stipulated by RBI.

- A non-resident may undertake Rupee interest rate derivatives transactions in India to hedge its interest rate risk using any product transacted on recognized stock exchanges subject to certain condition. Further, non-resident can undertake transaction for the purpose other than hedging to the extent stipulated by RBI and SEBI such as:
  - Foreign Portfolio Investors (FPIs), collectively, may also transact in interest rate futures (IRF) up to a limit of net long position of INR 50 billion in terms of RBI circular No. FMRD.DIRD.6/14.03.001/2017-18 dated March 01, 2018.
  - No Single FPI can acquire net long position in excess of INR 18 billion in interest rate futures at any point of time.
  - The total gross short (sold) position of any Foreign Portfolio Investor shall not exceed its consolidated long position in Government securities and Interest Rate Futures, at any point in time".

8.5.5 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. Current SEBI guideline /SCRR 1957 criteria does not permit NBFCs to registered as stock broker.

In addition to above, all the entities institutional as well as non-institutional can participate in ETIRD within the position limit (please refer section 7.6) specified by SEBI from time to time and any other restriction or guideline specified by respective regulators.

8.6 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.

As an industry association, FIMMDA addresses issues that affect the entire industry and is engaged in the development of Fixed Income and Derivatives market in India. FIMMDA performs the following roles:

- Functions as the principal interface with Regulators (like Reserve Bank of India, Securities and Exchange Board of India, Ministry of Finance - Government of India, International Monetary Fund, World Bank)
- Mandated by the Reserve Bank of India for valuation of Government Bonds, Corporate Bonds and Securitized Papers for valuation of investment portfolios of Banks and Primary Dealers
- Undertakes developmental activities such as introduction of benchmarks and new products
- Suggests Legal and Regulatory framework for the development of new products
- Training and Development Support to the Debt & Derivatives Market
- Standardization of market practices

One of the main objectives of FIMMDA is to recommend and implement healthy business practices, ethical code of conduct, standard principles and practices to be followed by the members in their dealing of securities. For this, FIMMDA has prepared a handbook ("FIMMDA Handbook of Market Practices") which can be accessed on FIMMDA's website (www.fimmda.org). FIMMDA has also prepared a code of conduct ("FIMMDA Code of Conduct for Derivatives Transactions") in respect of derivative transactions particularly those involving end users to ensure a minimum common standard of market practices. This code of conduct lays out guidelines to be followed by all FIMMDA members and other market participants while undertaking derivatives transactions. These guidelines would broadly address issues relating to (a) Suitability and Appropriateness standards and procedures, (b) standards for reasonability of rates, (c) guidelines to avoid transactions that could result in acceleration/deferment of gains or losses and (d) guidelines for introduction of new products in the market.

In case of ETIRD, regulators have advised Exchanges to decide underlying securities for the purpose of GOI bond derivatives in consultation with FIMMDA.

Additional role specified by RBI to FIMMDA in Rupee Interest Rate Derivatives (Reserve Bank) Directions, 2019:

- Any floating interest rate or price or index used in IRDs in the OTC market shall be a benchmark published by an FBA (Financial Benchmark Administrator) or approved by The Fixed Income Money Market and Derivatives Association of India (FIMMDA) for this purpose. FIMMDA shall ensure that the floating rate approved by them is determined transparently, objectively and in arm's length transactions.
- For Interest Rate Derivatives in the OTC Market, settlement basis and other market conventions for IRD transactions shall be specified by FIMMDA, in consultation with market participants.

8.6.1 Role of Financial Benchmarks India Private Ltd.

The FBIL, jointly owned by FIMMDA, FEDAI and IBA, was formed in December 2014 as a private limited company under the Companies Act 2013. Its aim is to develop and administer benchmarks relating to money market, government securities and foreign exchange in India. It is responsible for all the aspects relating to the benchmarks to be issued by it, namely, collection and submission of market data and information including polled data , formulation, adoption and periodic review of benchmark calculation methodologies, calculation, publication and administration of benchmarks confirming to the highest standards of integrity, transparency and precision.

Role in the Interest Rate Market

- Benchmark Administration: FBIL administers several significant interest rate benchmarks, including the Overnight Interbank Borrowing Rate, Treasury Bill (T-Bill) rates, and the Mumbai Interbank Offered Rate (MIBOR).
- Pricing Mechanism: These benchmarks are crucial for pricing various financial products like loans, bonds, and other instruments, promoting market stability and accuracy.
- Transparency and Integrity: FBIL ensures the benchmarks are based on actual market transactions and adhere to international standards, fostering transparency and integrity in the market.
- Government Securities Valuation: FBIL is responsible for the valuation of government securities (g-secs) and State Development Loans (SDLs) portfolios, which were previously valued by FIMMDA.

Role in the Interest Rate Derivatives Market

- Reference Rates: FBIL provides the reference rates used in pricing and settling interest rate derivative products such as interest rate swaps etc.
- Standardization and Liquidity: By providing robust benchmarks, FBIL promotes standardization and liquidity in these markets, potentially lowering transaction costs.
- Conforming to Global Standards: FBIL has introduced the **Secured Overnight Rupee Rate (SORR)**—a trade-based benchmark derived from actual repo transactions—to replace MIBOR for better transparency and global alignment.
- Risk Management: The benchmarks published by FBIL are essential for managing interest rate risk within derivative contracts.

8.7 Eligibility Criteria for Members

The members registered by SEBI for trading in Currency/Equity Derivative Segment shall be eligible to trade in Interest Rate Derivatives also, subject to meeting the balance sheet net worth requirement as may be specified by the SEBI/ stock exchange from time to time. The membership of the Currency Derivatives Segment shall be separate from the

membership of the Equity Derivative Segment or the Cash Segment of a recognized stock exchange.

The membership of each segment of the Exchange is separate from the membership of the other segments of the Exchange. As per the SEBI (Stock Brokers) Regulations, 1992:

- The stock broker shall have such net worth and shall deposit with the stock exchange such sum as may be specified by the SEBI/ stock exchange from time to time.
- The clearing member/ self-clearing member shall have the minimum net worth and shall deposit the minimum sum specified by SEBI or a higher amount with the clearing corporation promoted by the respective stock exchange in the manner specified from time to time.
- The quantum of net worth to be maintained by the stock broker/clearing member, as specified in said regulation, shall be reckoned for all segments/stock exchanges. The quantum of deposit to be maintained by the stock broker/clearing member shall be separately calculated segment wise.
- The quantum of net worth to be maintained by the stock broker/clearing member, shall be reckoned for all segments/stock exchanges.

As per SEBI (Stock Brokers) Regulations, 1992, if a new entity desires to register as a stock broker or clearing member with any stock exchange or clearing corporation, as the case may be, then the entity shall apply to SEBI through the respective stock exchange or clearing corporation in the manner prescribed in the Stock Broker Regulations. The entity shall be issued one certificate of registration by SEBI, irrespective of the stock exchange(s) / clearing corporation(s) or number of segment(s). Further, as per the SEBI (Stock Brokers) Regulations, 1992, the existing requirement of obtaining registration as stock broker/ clearing member for each stock exchange/ clearing corporation has been done away with and instead a single registration with any stock exchange/ clearing corporation shall be required. For operating in any other stock exchange(s)/ clearing corporation(s), approval will be required from the concerned stock exchange or clearing corporation.

Eligibility Criteria for a Trading Member

The admission as a trading member on the Stock Exchanges is based on the various criteria like age, capital adequacy, financial track record, education, experience and fulfillment of criteria of “fit & proper person” as laid down in the SEBI (Intermediaries) Regulations, 2008. The Exchanges may stipulate additional requirements over and above the SEBI prescribed rules.

A. Base Minimum Capital (BMC)

BMC is the deposit given by the member of the exchange against which no exposure for trades is allowed. The base minimum capital for trading members in cash, derivatives and debt segment is shown below:

Categories	BMC Deposit
Only Proprietary trading without Algorithmic trading (Algo)	Rs 10 Lacs
Trading only on behalf of Client (without proprietary trading) and without Algo	Rs 15 Lacs
Proprietary trading and trading on behalf of Client without Algo	Rs 25 Lacs
All Brokers with Algo	Rs 50 Lacs

- The BMC deposit is meant to meet contingencies in any segment of the Exchange.
- For members who are registered on more than one segment of the same Exchange, the highest BMC deposit across various segments is applicable.
- No exposure is granted against BMC deposit.
- The Stock Exchanges shall be permitted to prescribe suitable deposit requirements, over and above the SEBI prescribed norms, based on their perception and evaluation of risks involved.
- Minimum 50 percent of the deposit shall be in the form of cash and cash equivalents.
- For stock brokers of exchanges not having nation-wide trading terminals, the deposit requirement shall be 40% of the above said BMC deposit requirements.
- Stock Exchanges shall maintain the BMC at Rs. 1 lakh if the average daily turnover is less than Rs.1 crore for any three consecutive months.

B. Eligibility Criteria

Eligibility criteria for membership are subject to the regulatory norms and provisions of SEBI and as provided in the Rules, Regulations, Byelaws and Circulars of the Exchanges. Securities Contracts (Regulation) Rules, 1957 has provided details of qualifications for membership of a recognized stock exchange:

Individual trading membership	
Age	Minimum Age: 21 years
Status	Indian Citizen
Education	At least HSC or Equivalent qualification
Experience	Applicant should have an experience of not less than two years as a partner with, or an authorized assistant or authorized remisier or apprentice to a member.

Partnership Firms registered under the Indian Partnership Act, 1932	
Where the applicant is a partnership firm, the applicant shall identify a Dominant Promoter Group as per the norms of the Exchange at the time of making the application. Any change in the shareholding of the partnership firm including that of the said Dominant Promoter Group (DPG) or their sharing interest shall be effected only with the prior permission of Exchange/SEBI.	
Age	Minimum Age of designate partner: 21 years
Status	Registered Partnership firm under Indian Partnership Act, 1932

Designated Partners	Identify at least two partners as designated partners who would be taking care of the day-to-day management of the partnership
Education	Designated Partners should be at least HSC or equivalent qualification
Designated Partners Experience	Should have a minimum of 2 years' experience in an activity related to dealing in securities or as portfolio manager or as investment consultant or as a merchant banker or in financial services or treasury, broker, authorized agent or authorized clerk or authorized representative or remisier or apprentice to a member of a recognized stock exchange, dealer, jobber, market maker, or in any other manner in dealing in securities or clearing and settlement thereof.
Dominant Promoter Norms	Identify partner's sharing interest as per Exchange DPG norms

Limited Liability Partnership (LLP)

An LLP as defined in the Limited Liability Partnership Act, 2008 (6 of 2009), shall be eligible to be admitted as a member of a Stock Exchange if, such 'limited liability partnership' undertakes to comply with such financial requirements and norms as may be specified by the Securities and Exchange Board of India for the registration of such limited liability partnerships under sub-section (1) of section 12 of the SEBI Act, 1992 (15 of 1992);

The designated partners of the 'limited liability partnership' are not disqualified from being members of a stock exchange under sub-rule (1) of rule 8 [except sub-clauses (b) and (f) thereof] or sub-rule (3) of rule 8 [except sub-clauses (a) and (f) thereof] of the Securities Contracts (Regulation) Rules, 1957 and the designated partners of the 'limited liability partnership' had not held the offices of Directors in any company or body corporate or partner in any firm or 'limited liability partnership', which had been a member of the stock exchange and had been declared defaulter or expelled by the stock exchange.

Status	Registered Limited Liability Partnership under Limited Liability Partnership Act, 2008
Designated Partners	Identify at least two partners as designated partners who would be taking care of the day to day management of the limited liability partnership
Age	Minimum age of designated partner(s) : 21 years
Designated Partners Education	Designated Partners should be at least HSC or equivalent qualification
Designated Partners Experience	Should have a minimum of 2 years' experience in an activity related to dealing in securities or as portfolio managers or as investment consultants
Dominant Promoter Norms	Identify partner's sharing interest as per Exchange DPG norms

Corporations / Companies /Institutions

A Company as defined in the Companies Act, 2013 (1 of 2013), shall be eligible to be admitted as a member of a Stock Exchange provided: such company is formed in

compliance with the provisions of Section 12 of the said Act; it undertakes to comply with such other financial requirements and norms as may be specified by the Securities and Exchange Board of India for the registration of such company under sub-section (1) of section 12 of the SEBI Act, 1992 (15 of 1992); The directors of such company are not disqualified for being members of a stock exchange under clause (1) of rule 8 [except sub-clauses (b) and (f) thereof] or clause (3) of rule 8 [except sub-clauses (a) and (f) thereof] of the Securities Contracts (Regulation) Rules, 1957 and the directors of the company had not held the offices of the directors in any company which had been a member of the stock exchange and had been declared defaulter or expelled by the stock exchange.	
Status	Corporate registered under The Companies Act, 2013 (Indian)
Minimum Paid up Equity Capital	As specified from time to time (Currently 30 lakhs)
Designated Directors	Identification of at least two directors as designated directors who would be managing the day to day trading operations
Age	Minimum age of designated director(s) : 21 years
Education	Each of the Designated Directors should be at least HSC or equivalent qualification
Designated Directors Experience	Should have a minimum of 2 years' experience in an activity related to dealing in securities or as portfolio manager or as investment consultant or as a merchant banker or in financial services or treasury, broker, authorised agent or authorised clerk or authorised representative or remisier or apprentice to a member of a recognised stock exchange, dealer, jobber, market maker, or in any other manner in dealing in securities or clearing and settlement thereof.
Dominant Promoter Norms	Identify dominant group as per Exchange DPG norms

Banks authorized by the Reserve Bank of India under section 10 of the Foreign Exchange Management Act, 1999 as AD Category - I bank are permitted to become trading and clearing members of the currency derivatives segment of the recognized stock exchanges, on their own account and on behalf of their clients, subject to fulfilling the following minimum prudential requirements:

- Minimum net worth of ₹ 500 crores.
- Minimum CRAR of 10 per cent.
- Net NPA should not exceed 3 per cent.
- Made net profit for last 3 years.

However, banks are allowed to participate in ETIRD only on their own account and not on behalf of their clients.

Similar to banks, Primary Dealers are also permitted to become trading and clearing members of the currency derivatives segment of the recognized stock exchanges.

C. Other Criteria:

At any point of time the applicant has to ensure that either the proprietor/one designated director/partner or the Compliance Officer of the applicant entity should be meeting the certification requirements as specified by SEBI or the Stock Exchanges. The certification requirements mandated by SEBI or by the exchanges make the members eligible for continued admittance norm for membership of the Exchange. Further, member should satisfy the minimum net worth and deposit requirement as specified by SEBI/Exchanges/Clearing Corporation from time to time.

The Exchange may also specify such standards for investor service and infrastructure with regards to any category of applicants as it may deem necessary, from time to time.

Who is not eligible to become a member:

Further to the capital and networth requirements, no entity shall be admitted as a member/partner or director of the member if:

- it has been adjudged bankrupt or a receiver order in bankruptcy has been made against him or he has been proved to be insolvent even though he has obtained his final discharge;
- it has compounded with his creditors for less than full discharge of debts;
- it has been convicted of an offence involving a fraud or dishonesty;
- it is engaged as a principal or employee in any business other than that of securities, or commodity derivatives except as a broker or agent not involving any personal financial liability unless he undertakes on admission to sever his connection with such business;
- it has been at any time expelled or declared a defaulter by any other Stock Exchange or he has been debarred from trading in securities by a Regulatory Authorities like SEBI, RBI etc.;
- it incurs such disqualification under the provisions of the Securities Contract (Regulations) Act, 1956 or Rules made there-under so as to disentitle such persons from seeking membership of a stock exchange;
- it incurs such disqualification consequent to which Exchange determines it to be not in public interest to admit him as a member on the Exchange, provided that in case of registered firms, body corporates and companies, the condition from (will apply to, all partners in case of partnership firms, all directors in case of companies); Exchange may from time to time modify / expand the scope of activities that could be considered as relevant experience for the above purpose.

For additional details participants are requested to refer Section 8 of Securities Contract (Regulation) Rules, 1957.

Fit and Proper Person[68]

For the purpose of determining whether an applicant or the stock broker, authorised persons trading member and clearing member is a fit and proper person, the SEBI Board may take into account of any consideration as it deems fit including but not limited to the following criteria in relation to the applicant or the intermediary, the principal officer [the director, the promoter] and the key management persons by whatever name called:
(a) Integrity, reputation and character
(b) Absence of convictions and restraints order
(c) Competence including financial solvency and net worth of the applicant
(d) Absence of categorisation as a wilful defaulter.

Authorized person

Trading members and participants are entitled to appoint authorized person to operate the trading workstations of Currency Derivatives Segment, with the approval of the exchange. Authorized person is not a member of a Stock Exchange but is 'Any person, individual, partnership firm, LLP or body corporate, who is appointed as such by a Stock Broker (including Trading Member) and who provides access to trading platform of a Stock Exchange as an agent of the Stock Broker'[69]. Authorized Person (AP) should satisfy the criteria as specified by SEBI/stock exchanges from time to time. The AP should have the necessary infrastructure like adequate office space, equipment and manpower to effectively discharge the activities on behalf of the stock broker. The Trading Member and Authorised Person shall enter into written agreement(s) in the form(s) prescribed by the Exchange. The agreement shall inter-alia cover scope of the activities, responsibilities, confidentiality of information, commission sharing, termination clause etc. The Trading Member shall be responsible for all acts of omission and commission of the Authorised Person as it shall be deemed to be that of the Trading Member.

[68] Schedule II, SEBI (Intermediaries) Regulations, 2008.
[69] https://www.sebi.gov.in/legal/circulars/aug-2018/role-of-sub-broker-sb-vis-a-vis-authorized-person-ap-39825.html (Discontinuation of Sub-broker category)

Sample Questions

1. In terms of jurisdiction of regulator, the regulation of interest rate derivatives is similar to that of _____.
    a. Equity Derivatives
    b. Cash Market
    c. Commodity Derivatives
    d. **Currency Derivatives**

2. RBI guideline on Rupee Interest Rate Derivatives (Reserve Bank) Directions, 2019 permit _____ to participate in interest rate derivatives contract.
    a. Non-Residents
    b. Non-Retail
    c. Retail
    d. **All of the above**

3. Position limits guideline for Exchange traded interest rate derivatives is provided by _____.
    a. RBI
    b. **SEBI**
    c. Ministry of Finance
    d. None of the above

4. Insurance companies are allowed to participate in interest rate futures only for _____.
    a. **Long Hedge**
    b. Short Hedge
    c. Both A and B
    d. None of the above

5. What is the Base Minimum Capital requirement specified by the SEBI for only Proprietary trading without Algorithmic trading (Algo)?
    a. Rs. 25 Lakhs
    b. Rs. 20 Lakhs
    c. Rs. 50 Lakhs
    d. Rs. **10 Lakhs**

CHAPTER 9: ACCOUNTING AND TAXATION

LEARNING OBJECTIVES:

After studying this chapter, you should know about following:

- Accounting Treatment of Derivatives
- Disclosure Requirement
- Taxation of ETIRD

9.1 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".

9.1.1 ICAI Guidance Notes on Accounting for Derivatives Contract (Revised 2021)[70]

The Institute of Chartered Accountants of India (ICAI) has issued guidance notes on Accounting for Derivatives Contract (Revised 2021). Brief points of the guidance note are given below:

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. In case the concerned regulator has not prescribed any accounting treatment for derivative contracts, the recommendations contained herein should be followed.

The accounting for derivatives covered by this Guidance Note is based on the following key principles:
(i) All derivative contracts should be recognised on the balance sheet and measured at fair value.
(ii) If any entity decides not to use hedge accounting as described in this Guidance Note, it should account for its derivatives at fair value with changes in fair value being recognised in the statement of profit and loss.
(iii) If an entity decides to apply hedge accounting as described in this Guidance Note, it should be able to clearly identify its risk management objective, the risk that it is hedging,

[70] https://resource.cdn.icai.org/65422asb060421.pdf

how it will measure the derivative instrument if its risk management objective is being met and document this adequately at the inception of the hedge relationship and on an on-going basis.
(iv) An entity may decide to use hedge accounting for certain derivative contracts and for derivatives not included as part of hedge accounting, it will apply the principles at (i) and (ii) above.
(v) Adequate disclosures of accounting policies, risk management objectives and hedging activities should be made in its financial statements.

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. Fair value in the context of derivative contracts represents the 'exit price' i.e., the price that would be paid to transfer a liability or the price that would be received when transferring an asset to a knowledgeable, willing counterparty. The fair value would also incorporate the effect of credit risk associated with the fulfilment of future obligations. The extent and availability of collateral should be factored in while arriving at the fair value of a derivative contract.

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:
(i) identify its risk management objective;
(ii) demonstrate how the derivative contract helps meet that risk management objective;
(iii) specify how it plans to measure the fair value of the derivative instrument if the derivative contract is effective in meeting its risk management objective (including the relevant hedge ratio);
(iv) document this assessment (of points (i), (ii), (v), (vi) and (vii) of this paragraph) at inception of the hedging relationship and subsequently at every reporting period;
(v) demonstrate in cases of hedging a future cash flow that the cash flows are highly probable of occurring.
(vi) conclude that the risk that is being hedged could impact the statement of profit and loss; and
(vii) adequately disclose its accounting policies, risk management objectives and hedging activities (as required by this Guidance Note) in its financial statements.

Certain derivative instruments that are traded on stock exchanges such as foreign exchange futures contracts or equity options / equity futures do not have such requirements and in those cases, in particular, it will be important to demonstrate compliance with the above criteria before hedge accounting can be applied.

In case a derivative contract is not classified as a hedging instrument because it does not meet the required criteria or an entity decides against such designation, it will be

measured at fair value and changes in fair value will be recognised immediately in the statement of profit and loss.

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.

Fair value hedge accounting model

A fair value hedge seeks to offset the risk of changes in the fair value of an existing asset or liability or an unrecognised firm commitment that may give rise to a gain or loss being recognised in the statement of profit and loss. A fair value hedge is a hedge of the exposure to changes in fair value of a recognised asset or liability or an unrecognised firm commitment, or an identified portion of such an asset, liability or firm commitment, that is attributable to a particular risk and could affect the statement of profit and loss.

An example of a fair value hedge is the hedge of a fixed rate bond with an interest rate swap, changing the interest rate from fixed to floating. Another example is the hedge of the changes in value of inventory using commodity futures contracts.

Cash flow hedge accounting model

A cash flow hedge seeks to offset certain risks of the variability of cash flows in respect of an existing asset or liability or a highly probable forecast transaction that may be reflected in the statement of profit and loss in a future period. Under the cash flow hedge, the hedging instrument is measured at fair value, but any gain or loss that is determined to be an effective hedge is recognized in equity, for e.g. cash flow hedge reserves. This is intended to avoid volatility in the statement of profit and loss in a period when the gains and losses on the hedge item are not recognized therein.

Net Investment Hedging

An investor in a non-integral operation is exposed to changes in the carrying amount of the net assets of the foreign operation arising from the translation of those assets into the reporting currency of the investor.

Principles relating to the hedge of a net investment in a foreign operation are:

- Foreign exchange gains and losses on a net investment in a non-integral foreign operation are recognised directly in equity. This occurs through the translation of the non-integral foreign operation's net assets for purposes of consolidation
- Gains and losses of foreign currency derivatives use as hedging instruments are recognised directly in equity to the extent that the hedge is considered to be effective

- The ineffective portion of the gains and losses on the hedging instruments is recognised in the statement of profit and loss immediately
- Any net deferred foreign currency gain and losses i.e. arising from both the net investment and hedging instruments are recognised in the statement of profit and loss at the time of disposal of the 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 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 bi-furcate 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.

This Guidance Note does not permit any netting off of assets and liabilities except where basis adjustment is applied under cash flow hedges and hence all the amounts presented in the financial statements should be gross amounts. Amounts recognised in the statement of profit and loss for derivatives not designated as hedges may be presented on a net basis.

Disclosures in financial statements

An entity should satisfy the broader disclosure requirements by describing its overall financial risk management objectives, including its approach towards managing financial risks. Disclosures should explain what the financial risks are, how the entity manages the risk and why the entity enters into various derivative contracts to hedge the risks. An entity should disclose the methodology used to arrive at the fair value of derivative contracts (whether used for hedging or not) and the extent of fair value gains/losses recognized in the statement of profit and loss and in equity. The entity should disclose its risk management policies. An entity is also required to make specific disclosures about its outstanding hedge accounting relationships. Insofar as disclosure of derivatives designated for hedging foreign currency risks are concerned, the same should be disclosed in the format specified under this Guidance Note, which also requires disclosure of all foreign exchange assets and liabilities including contingent liabilities, both hedged and unhedged.

Hedge Effectiveness:

Hedge effectiveness is the degree to which changes in the fair value or cash flows of the hedged item that are attributable to a hedged risk are offset by changes in the fair value or cash flows of the hedging instrument. Hedge ineffectiveness is the extent to which the changes in the fair value or the cash flows of the hedging instrument are greater or less than those on the hedged item. This Guidance Note does not prescribe one single method for how hedge effectiveness testing and ineffectiveness measurement should be conducted. The appropriate method for each entity will depend on the facts and circumstances relevant to each hedging programme and be driven by the risk management objective of the entity. Entities may apply commonly used measures such as critical terms match, dollar offset or regression methods as appropriate to assess hedge effectiveness.

9.1.2 Accounting Standard (AS) 30

Accounting Standard (AS) 30, "Financial Instruments: Recognition and Measurement", issued by the Council of the Institute of Chartered Accountants of India, specify about the accounting of derivatives contract. The objective of this Standard is to establish principles for recognising and measuring financial assets, financial liabilities and some contracts to buy or sell non-financial items. Accounting Standard (AS) 30 has defined Derivatives as:

A derivative is a financial instrument or other contract within the scope of this Standard with all three of the following characteristics:

(a) its value changes in response to the change in a specified interest rate, financial instrument price, commodity price, foreign exchange rate, index of prices or rates, credit rating or credit index, or other variable, provided in the case of a non-financial variable that the variable is not specific to a party to the contract (sometimes called the 'underlying');

(b) it requires no initial net investment or an initial net investment that is smaller than would be required for other types of contracts that would be expected to have a similar response to changes in market factors; and

(c) it is settled at a future date.

Accounting Standard 30 was eventually withdrawn and replaced by Ind AS 109 when India adopted the Indian Accounting Standards (Ind AS) framework. For companies in India following the Ind AS framework, Ind AS 109, Financial Instruments, now governs the accounting for derivatives. For entities not following Ind AS, the Guidance Note on Accounting for Derivative Contracts (latest revised edition is from 2021) is the applicable guidance for derivatives not covered by other specific Accounting Standards like AS 11.

9.1.3 Indian Accounting Standard (Ind AS) 109 – Financial Instruments

Ind AS 109, which is based on IFRS 9, is now the relevant and mandatory standard for companies that fall under the Ind AS roadmap. Ind AS 109 fully replaces the need for AS 30 in applicable entities. Ind AS 109 governs:

- Classification and measurement of financial instruments (including derivatives)
- Impairment of financial assets
- Hedge accounting
- Derecognition of financial assets and liabilities

This includes contracts like: Forwards, Futures, Options, Swaps, Embedded derivatives.

Key principles for derivatives under Ind AS 109

- Recognition and initial measurement: Derivatives are recognized on the balance sheet at fair value when the entity enters the contract. Fair value is defined as the price in an orderly transaction between market participants.
- Default measurement (Fair Value Through Profit or Loss—FVTPL): Derivatives, unless in a hedging relationship, are measured at FVTPL, with gains or losses recognized immediately in the profit and loss.
- Hedge accounting: Ind AS 109 provides criteria to apply hedge accounting, which aligns gain and loss recognition on hedging instruments and hedged items to reduce income statement volatility. This requires formal documentation, an economic relationship, confirmation that credit risk is not dominant, and a consistent hedge ratio.
- Types of hedge accounting: Ind AS 109 outlines three types:
    - Fair Value Hedge: Hedges changes in the fair value of recognized items or unrecognised firm commitments, with gains/losses recognized in profit and loss.
    - Cash Flow Hedge: Hedges variability in cash flows of recognized items or forecast transactions. Effective portions of gains/losses go to Other Comprehensive Income (OCI), ineffective portions to profit or loss.
    - Net Investment Hedge: Hedges foreign currency risk of a net investment in a foreign operation, similar to cash flow hedges.
- Embedded derivatives: Ind AS 109 requires that derivative components embedded in non-derivative contracts be separated and accounted for as standalone derivatives if they are not "closely related" to the host contract. If the embedded derivative cannot be measured reliably, the entire hybrid contract is designated as FVTPL

9.2 Taxation of Exchange Traded Interest Rate Derivatives

The gains or losses arising from trading in derivatives are taxable under the head 'Profits and Gains from Business or Profession' (PGBP). Any expenditure relating to administration is considered to be deductible. The Income-tax Act classifies the business income into 'speculative' and 'non-speculative'. Though Income arising from speculative transactions are taxable under the head PGBP, yet they are treated differently and rigorously from

non-speculative business income. Any loss arising from speculative transaction could be set off only from speculative income.
A transaction is deemed as speculative if it is periodically or ultimately settled otherwise than through actual delivery or transfer. However, Section 43(5) has specifically excluded certain derivative transactions from the meaning of speculative transaction as these instruments are used for hedging underlying assets. Further, an eligible transaction in respect of trading in derivatives referred to in clause (*ac*) of section 2 of the Securities Contracts (Regulation) Act, 1956 (42 of 1956) carried out in a recognised stock exchange shall not be deemed to be a speculative transaction. Thus, income or loss from dealing in exchange traded interest rate derivatives shall be deemed as normal business income (non-speculative business) even though delivery is not effected in such transactions. Since it is treated as business income, you can claim deductions for expenses incurred for trading. Further, any loss arising from Exchange traded derivatives can be set off against any normal business income. The business income of an assessee is charged to tax at normal rates as applicable in case of an assessee. A taxpayer whose tax liability on the total taxable income from all the sources during the financial year exceeds INR 10,000 is liable to pay Advance Tax. Income for ETIRD is a non-speculative business income taxable at slab rates, hence are liable to pay Advance Tax.

However, securities held by FPIs are always treated as capital asset. Therefore, any profit and gains arising to FPI from derivative transactions shall always be taxable under the head capital gain. Generally, the derivatives positions are held for less than 12 months, any gain or loss arising to an FPI from dealing in derivatives shall be chargeable to tax as short-term capital gain or loss.

9.2.1 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.

Example: XYZ buys 20 lots of 7.26% GOI 2033 Futures at Rs.100 on 05/05/2023. XYZ sells these contracts at Rs.99 on 10/05/2023. XYZ buys 15 lots of 7.54% GOI 2036 Futures at Rs.100.50 on 07/05/2023. XYZ sells these contracts at Rs.101 on 12/05/2023.

- Loss from Trade 1 = (99-100) * 20*2000 = Rs. - 40000
- Profit from Trade 2 = (101-100.50) * 15*2000 = Rs. 15000
- Total Turnover = 40000+15000 = Rs.55000

Applicability of Tax Audit under Section 44

The computation of turnover is a very important factor as the applicability of tax audit is determined on the basis of turnover. The details of the same are given below:

1. Trading Turnover up to Rs. 2 Cr
    a. If the taxpayer has incurred a loss or the profit is less than 6% of Trading Turnover, has opted out of the presumptive taxation scheme in any of the immediate 5 previous years and his total income is more than the basic exemption limit in any of the previous years, then Tax Audit under section 44AB(e) is applicable.
    b. If the taxpayer has a profit of more than or equal to 6% of Trading Turnover, then Tax Audit is not applicable.
2. Trading Turnover between Rs. 2 Cr and Rs. 10 Cr
    a. If the Trading turnover is between INR 2 Cr and INR 10 Cr then provisions of Section 44AB are not applicable as all transactions (which is more than 95%) are executed digitally. Hence, Tax Audit is not applicable irrespective of the profit or loss.
3. Trading Turnover more than Rs. 10 Cr
    a. Tax Audit under section 44AB(a) is applicable irrespective of the profit or loss

Note: In the case of Exchange traded derivative since all these trading transactions are digital, the prescribed rate under Sec 44AD would be 6% instead of 8% in normal cases.

9.2.2 Scheme of Taxation

The income from Exchange traded derivatives trading can be offered to tax under the normal scheme of taxation or the presumptive scheme of taxation under Section 44AD (subject to total turnover not exceeding Rs. 2 crores). Under the presumptive scheme, the investor can choose to declare the profits at the rate of 6% of turnover as the payment is always received through banking channels. The presumptive income computed as per the prescribed rate is the final income and no further expenses will be allowed or disallowed. Also, the person opting for this scheme is not required to maintain the books of accounts prescribed under section 44AA and get them audited. Further, he can pay 100% of the advance tax in a single instalment up to 15th March of the relevant financial year.

Person having income from Exchange Traded Currency Derivatives can opt for the new tax regime under Section 115BAC of the Income Tax Act. If the person opts for the new tax regime, he/she cannot claim Chapter VI-A deductions, cannot set off any brought forward business loss, cannot carry forward the business loss to future years etc.

9.2.3 Set-off and Carry Forward of Losses

The losses from the trading of Exchange traded derivatives, if treated as a normal business loss, can be set off against the income from the other heads. However, the business loss cannot be set off against the income from salary.

The unabsorbed loss can be carried forward up to 8 Assessment years. It can be set off only against the business income in the subsequent years. It is important to note that the assessee is entitled to carry forward the business loss provided the return of income is filed on or before the due date. If such return is not filed within the prescribed due date, the right to carry forward and set-off is lost.

If entity have opted for the new tax regime, they cannot set off the brought forward business loss against business incomes. Further, they cannot carry forward the business loss to future years.

Sample Questions

1. Guidance Notes on Accounting for Derivatives Contract recognise following type of hedging for hedge accounting: _____.
    a. fair value hedge accounting model
    b. The cash flow hedge accounting model
    c. The hedge of a net investment in a foreign operation
    d. **All of the above**

2. Which of the following Indian Accounting Standards provides guidelines on accounting of derivatives?
    a. IAS 6
    b. IAS 30
    c. IAS 104
    d. **IAS 109**

3. Usually, income from Exchange traded derivatives is treated as _____.
    a. **Business income**
    b. Income from other sources
    c. Professional income
    d. None of the above

4. Loss on derivative transactions which are carried out in a "recognized stock exchange" can be set off against any other income during the year, except _____.
    a. Business income
    b. Income from other sources
    c. **Salary income**
    d. None of the above

5. Loss on derivative transactions which are carried out in a "recognized stock exchange" can be carried forward for a period of _____ assessment years.
    a. 5
    b. 6
    c. 7
    d. **8**

CHAPTER 10: CODE OF CONDUCT AND INVESTOR PROTECTION MEASURE

LEARNING OBJECTIVES:

After studying this chapter, you should know about following:

- Code of Conduct for Broker
- Investor Grievance Redressal Mechanism
- Online Resolution of Disputes in the Indian Securities Market
- Arbitration Mechanism
- Risk Disclosure to Client and KYC

10.1 SEBI's Code of Conduct for Brokers

Schedule II of the SEBI (Stock Brokers) Regulations, 1992 prescribes a code of conduct for securities brokers, which is discussed below:

A. General

1. Integrity: Shall maintain high standards of integrity, promptitude and fairness in the conduct of all its business.
2. Exercise of Due Skill and Care: Shall act with due skill, care and diligence in the conduct of all its business.
3. Manipulation: Shall not indulge in manipulative, fraudulent or deceptive transactions or schemes or spread rumours with a view to distorting market equilibrium or making personal gains.
4. Malpractices: Shall not create false market either singly or in concert with others or indulge in any act detrimental to the investors' interest or which leads to interference with the fair and smooth functioning of the market.
5. Compliance with Statutory Requirements: Shall abide by all the provisions of the Act and the rules, regulations issued by the Government, the Board and the stock exchange from time to time as applicable.

Duty towards the Investor

1. A stock-broker, in his dealings with the clients and the general investing public, shall faithfully execute the orders for buying and selling of securities at the best available market price and not refuse to deal with a small Investor merely on the ground of the volume of business involved.
2. A stock-broker shall promptly inform his client about the execution or non-execution of an order and make on time payment in respect of securities sold and arrange for on time delivery of securities purchased by clients.
3. A stock-broker shall issue without delay to his client a contract note for all transactions in the form specified by the stock exchange.

4. A stock-broker shall not disclose or discuss with any other person or make improper use of the details of personal investments and other information of a confidential nature of the client which he comes to know in his business relationship.
5. A stock-broker shall not encourage sales or purchases of securities with the sole object of generating brokerage or commission. He shall not furnish false or misleading quotations or give any other false or misleading advice or information to the clients with a view of inducing him to do business in particular securities and enabling himself to earn brokerage or commission thereby.
6. A stock-broker shall not deal or transact business knowingly, directly or indirectly or execute an order for a client who has failed to carry out his commitments in relation to securities with another stock-broker.
7. A stock-broker, when dealing with a client, shall disclose whether he is acting as a principal or as an agent and shall ensure at the same time that no conflict of interest arises between him and the client. In the event of a conflict of interest, he shall inform the client accordingly and shall not seek to gain a direct or indirect personal advantage from the situation and shall not consider clients' interest inferior to his own.
8. A stock-broker shall not make a recommendation to any client who might be expected to rely thereon to acquire, dispose of, retain any securities unless he has reasonable grounds for believing that the recommendation is suitable for such a client upon the basis of the facts, if disclosed by such a client as to his own security holdings, financial situation and objectives of such investment.
9. A stock broker or any of his employees shall not render, directly or indirectly, any investment advice about any security in the publicly accessible media, whether real-time or non-real-time, unless a disclosure of his interest including the interest of his dependent family members and the employer including their long or short position in the said security has been made, while rendering such advice. In case an employee of the stock broker is rendering such advice, he shall also disclose the interest of his dependent family members and the employer including their long or short position in the said security, while rendering such advice.
10. A stock-broker should have adequately trained staff and arrangements to render fair, prompt and competence services to his clients.

Duty towards Other Stock-Brokers

1. A stock-broker shall co-operate with the other contracting party in comparing unmatched transactions. A stock-broker shall not knowingly and wilfully deliver documents which constitute bad delivery and shall co-operate with other contracting party for prompt replacement of documents which are declared as bad delivery.
2. A stock-broker shall extend fullest co-operation to other stock-brokers in protecting the interests of his clients regarding their rights to dividends, bonus shares, right shares and any other right related to such securities.
3. A stock-broker shall carry out his transactions with other stock-brokers and shall comply with his obligations in completing the settlement of transactions with them.
4. A stock-broker shall not advertise his business publicly unless permitted by the stock exchange.

5. A stock-broker shall not resort to unfair means of inducing clients from other stock-brokers.
6. A stock-broker shall not neglect or fail or refuse to submit the required returns and not make any false or misleading statement on any returns required to be submitted to the SEBI and the stock exchange.

10.2 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. However, there may be occasions when the investors have grievances against a) intermediary/broking firm through which it is carrying out the transactions or/and (b) against the company of which it is a shareholder. In the event of any grievance(s), the investor is first required to approach the concerned intermediary/trading firm/company for settling his/her grievance.

10.2.1 Investor Grievance Handling at the Trading Member Level

All the trading firms have a designated cell/person for redressing investor grievances. When a complaint is filed by the investor, matter has to be resolved at the branch level or the firm level depending upon the nature of the complaint. All the registered brokers shall designate an e-mail ID of the grievance redressal division/compliance officer exclusively for the purpose of registering complaints by investors. The broker shall also display the email ID and other relevant details prominently on their websites and in the various materials/pamphlets/advertisement campaigns initiated by them for creating investor awareness. Further, for information of all investors who deal/ invest/ transact in the market, the offices of all stock brokers (its registered authorized person(s)) shall prominently display basic information about the grievance redressal mechanism. The stock broker shall endeavour to redress investor grievances promptly within the time specified by the SEBI/Exchanges from time to time. The stock broker shall maintain records regarding investor grievances received by it and redressal of such grievances.

SEBI has issued circular[71] for "Publishing Investor Charter and disclosure of Investor Complaints by Stock Brokers on their websites". SEBI has prepared an Investor Charter for Stock Brokers inter-alia detailing the services provided to Investors, Rights of Investors, various activities of Stock Brokers with timelines, DOs and DON'Ts for Investors and Grievance Redressal Mechanism. The stock broker shall endeavor to redress investor grievances promptly within the time specified (currently within 21 days from the receipt of compliant) by the SEBI/Exchanges from time to time. The stock broker shall maintain records regarding investor grievances received by it and redressal of such grievances. Stock Exchanges are directed to advise Stock Brokers to bring the Investor Charter to the notice of their clients (existing as well as new clients) through disclosing the Investor

[71]https://www.sebi.gov.in/legal/circulars/dec-2021/publishing-investor-charter-and-disclosure-of-investor-complaints-by-stock-brokers-on-their-websites_54402.html

Charter on their respective websites, making them available at prominent places in the office, provide a copy of Investor Charter as a part of account opening kit to the clients, through e-mails/ letters etc. Further, in order to bring about transparency in the Investor Grievance Redressal Mechanism, it has been decided that all the Stock Brokers shall disclose on their respective websites, the data on complaints received against them or against issues dealt by them and redressal thereof, latest by 7th of succeeding month, as per the format provided in the above circular. According to SEBI (Intermediaries) Regulations 2008, The stock broker shall at the end of each quarter of a financial year ending on 31st March upload information about the number of investor grievances received, redressed and those remaining unresolved beyond three months of the receipt thereof by the stock broker on the website.

10.2.2 Investor Grievance handling at the SEBI and Stock Exchanges

In case the complainant or the aggrieved investor is unsatisfied with the redressal process of the trading member then the investor can take his grievance to the stock exchange or SEBI.

10.2.2.1 SEBI Complaints Redressal System (SCORES)

SEBI handles the investor grievances through a system called SEBI Complaints Redressal System (SCORES). SCORES is a web based centralized system to capture investor complaints against listed companies and registered intermediaries and is available 24x7. Salient features of SCORES are:

- Centralized database of all complaints.
- Online movement of complaints to the concerned entities.
- Online upload of Action Taken Reports (ATRs) by the concerned entities.
- Online tracking of status of complaints by investors.

It allows the investors to lodge their complaints and track the status online. Investors who wish to lodge a complaint on SCORES are requested to register themselves on www.scores.gov.in.[72] When a complaint is lodged on SCORES, an email acknowledgement is generated for reference and tracking. 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. However, if an investor submits a manual complaint, the same is digitized by SEBI and uploaded on SCORES. Thereafter, follow-up actions of the complaint are done in electronic form only i.e., through SCORES. Investors can easily access, retrieve and preserve the complaints lodged by them in electronic mode. Further, it enhances the turnaround time and speed of redressal of a complaint.

[72] https://www.sebi.gov.in/legal/circulars/mar-2018/investor-grievance-redress-mechanism-new-policy-measures_38481.html and https://www.sebi.gov.in/legal/circulars/feb-2025/investor-charter-for-stock-brokers_92099.html

Investors may contact the Investor Associations (IAs) recognized by SEBI for any assistance in filing complaints on SCORES. The lists of Investor Associations are available on SEBI website (www.sebi.gov.in). Investors may also seek assistance in filing complaints on SCORES from SEBIs toll free helpline numbers. SEBI has received inputs from listed companies and intermediaries that investor grievances can be resolved faster if the grievance been taken up directly with the entity at the first instance. Accordingly, it appears to be prudent and time saving if the investors approach the concerned listed company or registered intermediary first with all the requisite details to redress the complaints. In case, the listed company or registered intermediary fails to redress the complaint to the investor's satisfaction, the investor may file a complaint in SCORES.

SEBI vide circular SEBI/HO/OIAE/IGRD/CIR/P/2023/156 dated September 20, 2023, provided revised framework for Redressal of investor grievances through the SEBI Complaint Redressal (SCORES) Platform and linking it to Online Dispute Resolution platform. Few details of the revised framework are given below. For more details, participants are requested to refer the SEBI circular.

Submission of the Complaint and handling of the Complaint by the Entity:

- All Entities who are in receipt of the complaints of the investors ("Complaint") through SCORES, shall resolve the complaint within 21 calendar days of receipt of such Complaint.
- The Complaints lodged on SCORES against any Entity shall be automatically forwarded to the concerned Entity through SCORES for resolution and submission of Action Taken Report (ATR). Entities shall resolve the Complaint and upload the ATR on SCORES within 21 calendar days of receipt of the Complaint. The ATR of the entity will be automatically routed to the complainant.
- The Designated Body (for Stock broker, Stock Exchange is Designated Body) shall ensure that the concerned Entity submits the ATRs within the stipulated time of 21 calendar days.
- If the complainant is not satisfied, the complainant may request for a review of the resolution provided by the entity within 15 calendar days from the date of the ATR.
- The Designated Body may seek clarification on the ATR submitted by the Entity for the first review. The concerned Entity shall provide clarification to the respective Designated Body, wherever sought and within such timeline, as the Designated Body may stipulate. The Designated Body shall stipulate the timeline in such as manner to ensure that the Designated Body submits the revised ATR to the complainant on SCORES within 10 calendar days of the review sought
- The complainant may seek a second review of the Complaint within 15 calendar days from the date of the submission of the ATR by the Designated Body. In case the complainant is satisfied with the ATR provided by the concerned Designated Body or complainant does not choose to review the Complaint within the period of 15 calendar days, the Complaint shall be disposed on SCORES. In case the

complainant is not satisfied with the ATR provided by the Designated Body or the concerned Designated Body has not submitted the ATR within 10 calendar days, SEBI may take cognizance of the Complaint for second review through SCORES.

- The second review Complaint shall be treated as 'resolved' or 'disposed' or 'closed' only when SEBI 'disposes' or 'closes' the Complaint in SCORES. Hence, mere filing of ATR with respect to SEBI review complaint will not mean that the SEBI review complaint is disposed.

Presently, the limitation period for filing an arbitration reference with stock exchanges is three years. In order to enhance ease, speed & accuracy in redressal of investor grievance, the investor may lodge a complaint on SCORES within one year from the date of cause of complaint;

- where Investor has approached the listed company or registered intermediary for redressal of the complaint **and**,
- The concerned listed company or registered intermediary rejected the complaint **or**,
- The complainant does not receive any communication from the listed company or intermediary concerned **or**,
- The complainant is not satisfied with the reply given to him or redressal action taken by the listed company or an intermediary.

An investor who has lodged the complaint can verify the status by logging in using unique complaint registration number. Every complaint has an audit trail and saves in a central database. If the complaint is successfully resolved the entity is advised to send reply to complainant.

It is pertinent to note here that at present following types of complaints are not dealt through SCORES

i. Complaints against the companies which are unlisted/delisted, in dissemination board of Stock Exchanges,
ii. Complaints those are sub-judice i.e., relating to cases which are under consideration by court of law, quasi-judicial proceedings, etc.
iii. Complaints falling under the purview of other regulatory bodies viz. RBI, IRDAI, PFRDA, CCI, etc., or under the purview of other ministries viz., MCA, etc.
iv. Complaints against a sick company or a company where a moratorium order is passed in winding up / insolvency proceedings.
v. Complaints against the companies where the name of company is struck off from RoC or a vanishing company as per list published by MCA.
vi. Companies under liquidation / BIFR / etc.

Following matters cannot be considered as complaints under SCORES:

a. Complaint not pertaining to investment in securities market

b. Anonymous Complaints (except whistle-blower complaints)

c. Incomplete or un-specific complaints

d. Allegations without supporting documents

e. Suggestions or seeking guidance/explanation

f. Not satisfied with trading price of the shares of the companies

g. Non-listing of shares of private offer

h. Disputes arising out of private agreement with companies/intermediaries

i. Matter involving fake/forged documents

j. Complaints on matters not in SEBI purview

k. Complaints about any unregistered/ un-regulated activity

To enhance investor satisfaction on complaint redressal, SEBI has put in place a 'Complaint Review facility' under SCORES wherein an investor if unsatisfied with the redressal may within 15 days from the date of closure of his complaint in SCORES opt for review of the complaint and the complaint shall be escalated.

In order to increases the awareness regarding online grievance redressal mechanisms, all Recognized Stock Exchanges / Depositories / Clearing Corporations are advised to display the following on the home page of their websites and mobile apps.

- Link / option to lodge complaint with them directly.
- Link to SCORES website/ link to download SCORES mobile app.

In its continuous pursuit of protection of interests of investors in the securities market, SEBI has launched the new version of the SEBI Complaint Redressal System (SCORES 2.0) w.e.f. April 01, 2024. The new version of SCORES strengthens the investor complaint redress mechanism in the securities market by making the process more efficient through auto-routing, auto-escalation, monitoring by the 'Designated Bodies and reduction of timelines. The new SCORES system has also been made more user friendly. The website URL for SCORES 2.0 from April 01, 2024 is https://scores.sebi.gov.in.
The salient features of SCORES 2.0 are as follows:

- Reduced and uniform timelines for redressal of investor complaints across the Securities Market i.e. 21 Calendar days from date of receipt of complaint.
- Introduction of auto-routing of complaints to the concerned regulated entity so as to eliminate time lapses, if any, in the flow of complaints.
- Monitoring of the timely redressal of the investors' complaints by the 'Designated Bodies'.
- Providing two levels of review: First review by the 'Designated Body' if the investor is dissatisfied with the resolution provided by the concerned regulated entity. Second review by SEBI if the investor is still dissatisfied after the first review.
- Introduction of auto-escalation of complaint to the next level in case of non-adherence to the prescribed timelines by the regulated entity or the Designated Body as the case may be.

- Integration with KYC Registration Agency database for easy registration of the investor on to SCORES.

Investors can lodge complaints only through new version of SCORES i.e. https://scores.sebi.gov.infrom April 01, 2024.

10.2.2.2 Investor Service Centres (ISCs) of Stock Exchanges

SEBI vide Circular No. SMD/POLICY/CIR-32/97 dated December 03, 1997 advised all stock exchanges to open or maintain at least one Investor Service Centre (ISC) for the benefit of the investors. Such centres are required to, inter alia, provide counseling service and provide certain basic minimum facilities to the investors. Subsequently, SEBI has mandated Exchanges to open ISCs in metro cities (viz., New Delhi, Mumbai, Chennai and Kolkata), and stock exchanges having nationwide terminals shall open ISCs additionally in Ahmedabad, Hyderabad, Kanpur, Indore, Bangalore, Pune, Jaipur, Ghaziabad, Lucknow, Gurgaon, Patna and Vadodara. SEBI has advised Exchanges to provide certain minimum facilities in ISCs centres. Some of the facilities are given below:

- Four financial daily newspapers with at least one in the regional language of the place where the ISC is situated.
- A dedicated desktop or laptop with internet connectivity to enable the investors to access various relevant information available in public domain and also to access SEBI's and stock exchange's grievance redressal portals
- Facilities for receiving investor complaints in both physical and electronic form.
- Facilitation desks at all ISCs to assist the investors in the dispute resolution process.
- Arbitration and appellate arbitration facility at all ISCs including video-calling facility to investors for attending their online arbitration (including appellate arbitration) or Grievance Redressal meetings, if any.
- A meeting room for at least 5 to 6 persons and additional sitting space for at least 5 to 6 persons.

With the recent developments in the securities market including introduction of Online Dispute Resolution (ODR) platform and SCORES 2.0, it SEBI has modified the Investor Charter for Stock Exchanges inter-alia detailing the services provided to Investors, Rights of Investors, various activities of stock exchanges with timelines, DOs and DON'T's for Investors, Responsibilities of Investors, Code of Conduct for Stock Exchanges and Grievance Redressal Mechanism.[73]

Mode of filing the complaints –Complaints can be lodged on the Exchange in the following ways:

(i) Through SCORES 2.0

Two Level Review: a) First review done by Exchange. b) Second review done by SEBI.

[73] https://www.sebi.gov.in/legal/circulars/may-2024/investor-charter-for-stock-exchanges_83653.html

(ii) Respective Exchange's web portal dedicated for the filing of compliant [link to be provided by Exchange]
(iii) Emails to designated email IDs of Exchange [link to be provided by Exchange]
(iv) Through SMARTODR (https://smartodr.in/login) dedicated for the filing of complaint.

10.3 Online Resolution of Disputes in the Indian Securities Market[74]

After extensive public consultations and in furtherance of the interests of investors and consequent to the gazette notification (dated July 3, 2023) of the SEBI (Alternative Dispute Resolution Mechanism) (Amendment) Regulations, 2023 the existing dispute resolution mechanism in the Indian securities market is being streamlined under the aegis of Stock Exchanges and Depositories (collectively referred to as Market Infrastructure Institutions(MIIs)), by expanding their scope and by establishing a common Online Dispute Resolution Portal ("ODR Portal") which harnesses online conciliation and online arbitration for resolution of disputes arising in the Indian Securities Market**.**

10.3.1 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. Listed companies / specified intermediaries / regulated entities OR their clients/investors (or holders on account of nominations or transmission being given effect to) may also refer any unresolved issue of any service requests / service-related complaints[75] for due resolution by harnessing online conciliation and/or online arbitration as specified in SEBI circular.

Disputes between institutional or corporate clients and specified intermediaries / regulated entities in securities market can be resolved, at the option of the institutional or corporate clients:
a. in accordance with this circular and by harnessing online conciliation and/or online arbitration as specified in this circular, OR
b. by harnessing any independent institutional mediation, conciliation and/or online arbitration institution in India.

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[74] https://www.sebi.gov.in/legal/circulars/jul-2023/online-resolution-of-disputes-in-the-indian-securities-market_74794.html & https://www.sebi.gov.in/legal/circulars/aug-2023/corrigendum-cum-amendment-to-circular-dated-july-31-2023-on-online-resolution-of-disputes-in-the-indian-securities-market_74976.html

[75] Service-related complaints shall include non-receipt/ delay of account statement, non-receipt/ delay of bills, closure of account/branch, technological issues, shifting/closure of branch without intimation, improper service by staff, freezing of account, alleged debit in trading account, contact person not available, demat account transferred without permission etc.

For existing and continuing contractual arrangements between institutional or corporate clients and specified intermediaries / regulated entities in the securities market, such option should be exercised within a period of six months, failing which option as specified in (a) above will be deemed to have been exercised. For all new contractual arrangements, such choice should be exercised at the time of entering into such arrangements.

Disputes between MII and its constituents which are contractual in nature shall be included in the framework at a future date as may be specified while expressly excluding disputes/appeals/reviews/challenges pertaining to the regulatory, enforcement role and roles of similar nature played by MIIs.

10.3.2 Empanelment of ODR Institution

An MII shall empanel one or more ODR Institutions as a service provider and enter into relevant agreements with such ODR Institution(s) in accordance with guidelines issued by the SEBI. MIIs should ensure that the primary/first ODR Institution to be empaneled with it, is not empaneled as the primary/first ODR Institution with any other MIIs. An MII shall collect requisite information of an ODR Institution desirous of being empaneled for providing ODR services for the Indian Securities Market. Such information shall include: copies of registration certificate, memorandum of association and articles of association/ constitutional documents, rules governing conciliation and arbitration, PAN, Legal Entity Identifier number, composition of its board of directors, governing bodies and advisory councils, if any, and details of its shareholders and investors, and list of its authorized officials / signatories. An ODR Institution empaneled by an MII should be/become a member of association/trade body having as its members MII empaneled ODR Institutions for the Indian Securities Market.

10.3.3 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
- 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 and for inspection and/or audit of the ODR Platform.
- SEBI shall from time to time, undertake inspection in order to ensure proper functioning of ODR Portal and MIIs shall provide complete cooperation to SEBI in this regard.
- Each MIIs will identify and empanel one or more independent ODR Institutions which are capable of undertaking time-bound online conciliation and/or online arbitration (in accordance with the Arbitration and Conciliation Act, 1996 and any other applicable laws) that harness online/audio-video technologies and have duly

qualified conciliators and arbitrators. ODR Portal shall establish due connectivity with the SEBI SCORES portal / SEBI Intermediary portal.

- All the MIIs shall participate on the ODR Portal and provide investors/clients and listed companies, their specified intermediaries access to the ODR portal for resolution of disputes between an investor/client and listed companies and the specified intermediaries / regulated entities in the securities market, through time bound online conciliation and/or online arbitration**.**

All Market participants in the securities market shall enroll on the ODR Portal within the timelines specified in SEBI circular and shall be deemed to have been enrolled on the ODR Portal at the end such specified timeline.

10.3.4 Initiation of the dispute resolution process

An investor/client shall first take up his/her/their grievance with the Market Participant by lodging a complaint directly with the concerned Market Participant. If the grievance is not redressed satisfactorily, the investor/client may, in accordance with the SCORES guidelines, escalate the same through the SCORES Portal in accordance with the process laid out therein. After exhausting these options for resolution of the grievance, if the investor/client is still not satisfied with the outcome, he/she/they can initiate dispute resolution through the ODR Portal.

Alternatively, the investor/client can initiate dispute resolution through the ODR Portal if the grievance lodged with the concerned Market Participant was not satisfactorily resolved or at any stage of the subsequent escalations mentioned in the above paragraph (prior to or at the end of such escalation/s).

Upon receipt of complaint on SMARTODR portal, the relevant MII will review the matter and endeavour to resolve the matter between the Market Participant and investor within 21 days. If the matter could not be amicably resolved, then to the matter shall be referred for conciliation.

The concerned Market Participant may also initiate dispute resolution through the ODR Portal after having given due notice of at least 15 calendar days to the investor/client for resolution of the dispute which has not been satisfactorily resolved between them.

10.3.5 ODR Portal and Allocation System

The ODR Portal shall have the necessary features and facilities to, inter alia, enrol the investor/client and the Market Participant, and to file the complaint/dispute and to upload any documents or papers pertaining thereto. It shall also have a facility to provide status updates on the complaint/dispute which would be obtained from the ODR Institutions. The features and facilities shall be periodically reviewed and upgraded by the MIIs as well as new features and facilities added from time to time as required by the

SEBI. The ODR Portal shall be subject to inspection and/or audit for, inter alia, verifying the adherence to these norms and applicable SEBI regulations, circulars and advisories.

A complaint/dispute initiated through the ODR Portal will be referred to an ODR Institution empanelled by a MII and the allocation system on a market-wide basis will be a round-robin system to govern the allocation of each such dispute among all such empanelled ODR Institution/s subject that for an initial period. References to ODR Institutions shall be made after a review of such complaint/dispute by the relevant MII with the aim of amicable resolution and such review shall be concluded within 21 calendar days.

10.3.6 Conciliation

The ODR Institution that receives the reference of the complaint/dispute shall appoint a sole independent and neutral conciliator from its panel of conciliators. Such conciliator shall have relevant qualifications or expertise and should not be connected with or linked to any disputing party. MIIs shall ensure that appropriate measures are put in place regarding appointment of conciliators by the ODR Institutions.
Such conciliator shall conduct one or more meeting/s for the disputing parties to reach an amicable and consensual resolution within 21 calendar days (unless extended for a maximum period of 10 calendar days by consent of the disputing parties to be recorded in writing/electronically) from the date of appointment of conciliator by the ODR Institution, which shall do so within 5 days of receipt of reference of the complaint/dispute by the ODR Institution. Apart from attempting to actively facilitate consensual resolution of the complaint/dispute, the conciliator may consider advising the Market Participant to render required service in case of service-related complaints/disputes and/or consider issuance of findings on admissibility of the complaint/dispute or otherwise in case of trade related complaints/dispute (as the case may be).

If the process of conciliation is successful, the same shall be concluded by a duly executed settlement agreement between the disputing parties. Such an agreement shall be executed and stamped through an online mode, as permissible in law. When such agreement requires the Market Participant to pay the admissible claim value to the investor/client, the MII shall monitor the due payment/adherence to the terms of the settlement agreement until due receipt by the investor/client and/or performance of the required terms of settlement agreement.

In case the matter is not resolved through the conciliation process within the 21 calendar days (or within the extended period of 10 calendar days, extended by consent of the disputing parties):

a. the conciliator should ascertain the admissible claim value of the complaint/dispute that the conciliator determines is payable to the investor/client and notify the

disputing parties as well as the ODR Institution and the MII of the same. Such determination should also be made in all claims/complaints/disputes where the monetary value has not been ascribed by the person initiating the dispute;

b. An investor/client may pursue online arbitration (which will be administered by the ODR Institution which also facilitated the conduct of conciliation) on or after the conclusion of a conciliation process when the matter has not been resolved through such process, subject to payment of fees as applicable for online arbitration;

c. In case the Market Participant wishes to pursue online arbitration (which will be administered by the ODR Institution which facilitated the conduct of conciliation), then the Market Participant must deposit 100% of the admissible claim value with the relevant MII prior to initiation of the online arbitration and make the payment of fees as applicable for online arbitration. In case the Market Participant fails to deposit the amount then they may not initiate online arbitration and they may also face consequences as determined necessary or appropriate by the Stock Exchange. On an application made by the investor/client in this behalf to the relevant MII, the MII may, from the deposit received, release such amount to the investor/client not exceeding Rs 5,00,000/- (Rupees Five lakhs) or such sum as may be specified from time to time. On or before release of the said amount to the investor/client, the MII shall obtain appropriate undertaking/ indemnity / security in such form, manner and substance from the investor/client to ensure return of the amount so released, in case the arbitration proceedings are decided against the investor/client.

10.3.7 Fees and Charges

The costs of the dispute resolution mechanism on the ODR Portal will be borne in the following manner:

a) There shall be no fees for registration of a complaint/dispute on the ODR Portal.

b) Fees for conciliation process (irrespective of claim or counter-claim value) will be as under:

	Amount in Rupees
Conciliator's fee (to be collected by ODR Institution and paid to Conciliator) - for successful conciliation - for unsuccessful conciliation	 Rs. 4800/- Rs. 3240/-
ODR Institution's fees, in addition to the conciliator's fees (to be collected by ODR Institution)	Rs. 600
Applicable GST, Stamp Duty, etc. on actual outgoings shall be borne by the concerned Market Participant	

Such fees may be borne by the MIIs and will be recoverable by them from the concerned Market Participant against whom the complaint/dispute is raised. Such fees shall be

borne directly by the concerned Market Participant if it is initiating the dispute process. The Market Participant shall not shift the incidence of such fees to the investor/client at any time.
Unsuccessful Conciliation: In the event the disputing parties are not able to arrive at a settlement within the stipulated time (or such extended period as agreed to by them) it shall be said to be unsuccessful conciliation.
Late Fees: Initiation of conciliation process after six months from the date of transaction/dispute arising will require payment of Rs 1000/- by the initiator of the complaint/dispute (whether such initiator be the investor/client or the Market Participant) and shall be collected by the MIIs and applied as specified by the Board from time to time.

10.3.8 Arbitration

Arbitration, which is a quasi-judicial process, is an alternate dispute resolution mechanism prescribed under the Arbitration and Conciliation Act, 1996. When the investor/client and/or the Market Participant pursue online arbitration, the ODR Institution shall appoint a sole independent and neutral arbitrator from its panel of arbitrators within 5 calendar days of reference and receipt of fees, cost and charges as applicable. Such arbitrator shall have relevant qualifications or expertise and should not be connected with or linked to any disputing party. In the event that the aggregate of the claim and/or counter-claim amount exceeds Rs 30,00,000/- (Rupees Thirty Lakhs) or such amount as the Board may specify from time to time, the matter shall be referred to an Arbitral Tribunal consisting of three Arbitrators (within 5 calendar days of reference) and receipt of fees, cost and charges as applicable. MIIs shall ensure that measures are put in place regarding appointment of arbitrators by the ODR Institutions. In the instance where the parties wish to withdraw from arbitration before the arbitrator has been appointed then the fees shall be refunded after deducting the applicable expenses not exceeding Rs 100/- (Rupees One Hundred). However, withdrawal shall not be permitted after appointment of an arbitrator.

Subject to value of claim and/or counter-claim being in excess of Rs 1,00,000/- (Rupees One Lakh), the Sole Arbitrator or Arbitral Tribunal shall conduct one or more hearing/s and pass the arbitral award within 30 calendar days (or such other period as the Board may specify) of the appointment in the matter. When the value of claim and/or counter-claim is Rs 1,00,000/- (Rupees One Lakh) or below (or such other sum as the SEBI may specify from time to time), the Sole Arbitrator shall conduct a document-only arbitration process and pass the arbitral award within 30 calendar days (or such other period as the SEBI may specify) of the appointment in the matter[76].However, the arbitrator, for reasons to be recorded in writing/electronically , may grant a hearing to the parties to the dispute. The Sole Arbitrator or Arbitral Tribunal shall be at liberty to extend such time for disputes

[76] If parties to the dispute do not provide any representation in the arbitral proceedings, the arbitrator may pass an ex-parte order after giving a notice of 7 calendar days to the concerned non-cooperative party(ies).

exceeding claims and/or counterclaims of Rs 1,00,000/- (Rupees One Lakh) (or such other sum as the Board may specify from time to time), up to a further period of 30 calendar days (or such other period as the Board may specify) and for reasons to be recorded in writing/electronically, when the matter requires detailed consideration. The Sole Arbitrator or Arbitral Tribunal may, having regard to the nature of the claim and/or counterclaim, provide interim relief as may be required for reasons to be recorded after affording hearing to the parties to the dispute. The parties may make an application under the relevant section of the Arbitration and Conciliation Act, 1996 for correction/rectification of the award.

Upon the conclusion of the arbitration proceedings and issuance of the arbitral award, subject to the terms of the arbitral award, when such arbitral award requires payment of any amount by the Market Participant or performance by it of a certain nature, then such payment shall be made by the Market Participant within a period of 15 calendar days from the date of the arbitral award (unless such award requires payment sooner), and/or performance within such period as specified by the arbitral award. The MII shall monitor the due payment/adherence to the terms of the arbitral award until due receipt by the investor/client and/or performance of the terms of arbitral award. In the event, the parties do not comply with the arbitral award, the relevant MII shall inform the Board regarding such non-compliance on a periodic basis. Furthermore, the relevant MII shall provide necessary assistance to the investor/client for enforcement of the arbitral award.

Upon the issuance/pronouncement of the arbitral award, the party against whom order has been passed, will be required to submit its intention to challenge the award under Section 34 of the Arbitration Act within 7 calendar days in the ODR Portal for onward notification to the party/ies in whose favour the arbitral award has been passed and the relevant MII. Further, in the course of such a challenge, if a stay is not granted within 3 months from the date of the receipt of award, complete adherence to the terms of the arbitral award must be done.

If the Market Participant wishes to challenge such an arbitral award, then the Market Participant must deposit 100% of the amounts payable in terms of the arbitral award with the relevant MII prior to initiation of the challenge. In case the specified intermediary/regulated entity fails to deposit the amount then they may also face consequences as determined necessary or appropriate by the Stock Exchange and could also be liable to be declared as not 'Fit and Proper' in terms of the SEBI (Intermediaries) Regulations, 2008 and would be inter-alia, liable to have their registration cancelled or their business activities suspended. A listed company that fails to deposit the amount may also face consequences as determined necessary or appropriate by the Stock Exchange. On an application made by the investor/client in this behalf to the relevant MII, the MII may, from the deposit received, release such amount to the investor/client not exceeding Rs 5,00,000/- (Rupees five lakhs) or such sum as may be specified from time to time. On or before release of the said amount to the investor/client, the MII shall obtain appropriate undertaking/ indemnity / security from the investor/client to ensure return

of the amount so released, in case the challenge is decided against the investor/client. If the challenge is decided against the investor/client, subject to the judgement of the appellate forum, such investor/client should return the released amounts. If the investor/client fails to return the amount released, then the investor/client (based on PAN of the investor/client) shall not be allowed to trade on any of the Stock Exchanges or participate in the Indian Securities Market till such time the investor/client returns the amount to the Market Participant. Further, the securities lying in the demat account(s) or the mutual fund holdings of the investor/client shall be frozen till such time as the investor/client returns the amount to the Market Participant. If security had been obtained, the same could be enforced/realised and adjusted towards the amount required to be returned. In the event, the challenge is decided in favour of the investor/client, subject to the terms of the judgement of the appellate forum, the MII shall release the balance deposit held by it (as deposited by the Market Participant) to the investor/client. The MII shall also monitor the due compliance by the Market Participant with the terms of the arbitral award/judgement of the appellate forum.

Form of Proceedings for Conciliation and Arbitration

The ODR Institutions shall conduct conciliation and arbitration in the online mode, enabling online/audio-video participation by the investor/client, the Market Participant and the conciliator or the arbitrator as the case may be. The investor/client may also participate in such online conciliation and arbitration by accessing/utilizing the facilities of Investor Service Centers (ISCs) operated by any of the MIIs. The venue and seat of the online proceedings shall be deemed to be the place:

a) In case of disputes between investor/client and listed companies (including their registrar and share transfer agents) or any of the specified intermediaries / regulated entities in securities market: where the investor resides permanently or, where the investor is not an individual, the place where it is registered in India or has its principal place of business in India, as provided in the relevant KYC documents

b) In case of disputes between institutional or corporate clients and specified intermediaries / regulated entities in securities market:

(i) where the institutional or corporate clients has its registered in India or has its principal place of business in India, as provided in the relevant KYC documents, and

(ii) if in case the the institutional or corporate client is not registered in India or does not have its principal place of business in India, then the place where the specified intermediaries / regulated entities in securities market as specified in Schedule B has its registered in India or has its principal place of business in India or

(iii) such court of competent jurisdiction in India as the institutional or corporate clients and specified intermediaries / regulated entities in securities market may agree upon.

10.3.9 Arbitration Fees

The fees for the arbitration process will be as under:

	Rs 0 –1 lakh *	**above Rs 1 lakh – 10 lakhs**	**above Rs 10 lakhs – 20 lakhs**	**above Rs 20 lakhs – 30 lakhs**	**above Rs 30 lakhs – 50 lakhs**	**Above Rs 50 lakhs – 1 Crore*** **
Arbitrator's fee (to be collected by ODR Institution and paid to Arbitrator)	4800	8000	12000	16000	60000**	120000**
ODR Institution's fees, in addition to the arbitrator's fees (to be collected by ODR Institution)	600	1000	1500	2000	7500	15000
Applicable GST, Stamp Duty, etc. on actual outgoings						

* This slab will be applicable for service request related disputes also

** Fee for panel of arbitrators shall be split into a ratio of 40:30:30 with the higher proportion being payable to the arbitrator writing the arbitral award

*** For 1 crore & above ad valorem fees @ 1% of the claim value towards arbitration fees and Rs. 35000 towards ODR institution's fees

Late Fees: Arbitration initiated after one month of failure of conciliation and up to six months, the fees payable would be double of the non-refundable fees specified in the table above. Arbitration initiated after six months by a Market Participant will require payment of, additional fee of 50% of the fees, specified in the table above applicable per additional month of delay and which shall be on non-refundable basis. Such late fees shall be collected by the MIIs and applied in relation to operationalization and effective functioning of the ODR Platform. The concerned ODR institution will collect the fees on behalf of MIIs.

10.3.10 Responsibilities of Market Participants – Under ODR

All agreements, contractual frameworks or relationships entered into by Market Participants with investors/clients in the Indian Securities market presently existing or

entered into hereafter shall stand amended or be deemed to incorporate provision to the effect that the parties agree to undertake online conciliation and/or online arbitration by participating in the ODR Portal and/or undertaking dispute resolution in the manner specified in this Circular.

The Market Participants shall promptly attend to all complaints or disputes raised by its investors or clients in accordance with applicable SEBI rules, regulations and circulars. The communications shall clearly specify, the availability of the SCOREs portal and the ODR Portal to the investor/client and that the same could be accessed by such investor/client if unsatisfied with the response (or the lack thereof) of the Market Participant.

The Market Participants shall duly train their staff in attending to complaints/disputes and in handling the references arising from the SCOREs portal or the ODR Portal, and in participating in online conciliation and arbitration. Due cooperation and coordination with the MIIs and with the ODR Institutions shall be ensured by the Market Participants.

The Board may require the Market Participants to maintain such level of interest-free deposit with the MIIs or with the concerned designated body identified vide the revised SCOREs guidelines and shall be such sums that it considers necessary and appropriate for honouring of any arbitral awards or amounts payable pending initiation of arbitration or challenge to an arbitral award. The amount of such deposit may vary depending on the category of Market Participant and may factor in the extent and nature of complaints or disputes against any specified Market Participant that are observable.
The circular also provides the details of Empanelment and Training of the Panel of Conciliator and Arbitrators & Roles and Responsibilities of MIIs.

Handling of Investor's claims / complaints in case of default of a Trading Member / Clearing Member (TM/CM)

Default of TM/CM

Following steps are carried out by Stock Exchange for benefit of investor, in case stock broker defaults:
• Circular is issued to inform about declaration of Stock Broker as Defaulter.
• Information of defaulter stock broker is disseminated on Stock Exchange website.
• Public Notice is issued informing declaration of a stock broker as defaulter and inviting claims within specified period.
• Intimation to clients of defaulter stock brokers via emails and SMS for facilitating lodging of claims within the specified period.

Following information is available on Stock Exchange website for information of investors:
- Norms for eligibility of claims for compensation from IPF.
- Claim form for lodging claim against defaulter stock broker.

- FAQ on processing of investors' claims against Defaulter stock broker.
- Provision to check online status of client's claim.
- Standard Operating Procedure (SOP) for handling of Claims of Investors in the cases of default by TMs
- Claim processing policy against Defaulter/Expelled TMs.
- List of Defaulter/Expelled TMs and public notice issued

In order to bring about transparency in the Investor Grievance Redressal Mechanism, it has been decided that all the Stock Exchanges / Depositories / Clearing Corporations shall disclose on their websites, the data on complaints received against them and redressal thereof, latest by 7thof succeeding month, as per the format specified by SEBI.

10.4 Investor Protection Fund

The Central Government, vide notification No. F. No. 14/4/SE/85 dated August 22, 1985, has stipulated the setting up of the Investor Protection Fund (IPF) by Stock Exchanges. This fund should take care of legitimate investment claims which are not of speculative nature of the clients of defaulting member(s). The Investor's Protection Fund is a fund established and maintained by the Exchanges with an aim to protect the interests of the clients of the trading members of the Exchange, who may have been declared defaulters or who may have been expelled, under the provisions of the Rules, Bye-laws and Regulations of the Exchange. The Investor Protection Fund/Customer Protection Fund (hereinafter referred to as IPF/CPF) shall be administered by way of a Trust created for the purpose.

Based on the feedback received from various market participants, discussions with Stock Exchanges, Depositories and deliberations in Secondary Market Advisory Committee (SMAC), SEBI has provided Comprehensive guidelines for Investor Protection Fund and Investor Services Fund at Stock Exchanges and Depositories[77]. Salient features of the circular are given below. For additional information, participant may refer the SEBI circular.

1. All stock exchanges and depositories shall establish an IPF. The IPF of the stock exchange and depository shall be administered through separate trusts created for the purpose.
2. The following contributions shall be made by the Stock Exchange to the IPF:

   a) 1% of the listing fees received, on a quarterly basis.

   b) 100% of the interest earned on the 1% security deposit kept by the issuer companies at the time of the offering of securities for subscription to the public, immediately on refund of the deposit.

[77] https://www.sebi.gov.in/legal/circulars/may-2023/comprehensive-guidelines-for-investor-protection-fund-and-investor-services-fund-at-stock-exchanges-and-depositories_71925.html

c) Penalty collected by stock exchanges from Trading Members (TMs) for deficiency in modification of client code, if any, pursuant to SEBI Circular No. CIR/DNPD/6/2011 dated July 05, 2011.

d) Penalty collected by stock exchanges from TMs for default in pay-in for certain trades during periodic call auction for Illiquid scrips, if any, pursuant to SEBI Circular No. CIR/MRD/DP/ 6/2013 dated February 14, 2013.

e) Penalties collected by stock exchanges from their listed companies for non-compliance with various requirements of the SEBI (Listing Obligation and Disclosure Requirements) Regulations 2015 pursuant to SEBI Circular no. SEBI/HO/CFD/CMD/CIR/P/2020/12 dated January 22, 2020.

f) Penalty collected from TMs for default in pay-in by an investor in an Offer For Sale (OFS)transaction –10% of the order value pursuant to SEBI Circular No. SEBI/HO/MRD/MRD-PoD-3/P/CIR/2023/10 dated January 10, 2023.

g) Contribution towards the IPF based on the transaction charges collected from the members of the exchange, as per policy of the respective stock exchange.

h) At least 70% of interest or income received out of any investments made from the IPF.

i) Any other contribution as may be specified by SEBI from time to time.

3. The amount in IPF and any interest or income generated from the IPF of the stock exchanges shall be utilized to meet the legitimate investment claims of the clients of the defaulting TMs and to pay interim relief to investors, if any, in terms of paragraph-2(D) of circular No. SEBI/HO/MRD1/ICC1/CIR/P/2021/625 dated September 02, 2021, if any.
4. Interest or income received out of any investments made from the IPF : At least 70% of interest or income from IPF received every year shall be ploughed back to IPF; 25% can be utilised for promotion of investor education and investor awareness.
5. The stock exchanges and depositories shall conduct half-yearly review (by end of March and September every year) to ascertain the adequacy of the IPF corpus. In case the IPF corpus is found to be inadequate, the same shall be enhanced appropriately.
6. The claims received against the defaulter TMs during the specified period shall be eligible for compensation from the IPF. Where the clients have dealt through the authorized persons of the defaulting TM, registered with the stock exchange, such clients will also be eligible for claims against the defaulting TM for compensation from the IPF. The claims of the investors or clients arising out of speculative transactions shall not be eligible for compensation from the IPF.

7. Any claim received after three years from the date of expiry of the specified period may be dealt with as a civil dispute.
8. The stock exchanges shall fix suitable per investor compensation limits, in consultation with the IPF Trust and SEBI.
9. The Stock Exchanges shall ensure that once a TM has been declared defaulter, the claim(s)shall be placed before the Member Core Settlement Guarantee Fund Committee (MCSGFC) for sanction and ratification. MCSGFC's 325dvice.r.t. legitimate claims shall be sent to the IPF Trust for immediate disbursement of the amount.
10. The IPF Trust shall disburse the amount of compensation from the IPF to the investor and such a compensation shall not be more than the maximum amount fixed for a single claim of an investor.
11. The Stock Exchange will disclose the corpus of the IPF on its website and update the same on a monthly basis. Also disseminate the policy on processing investor claims from IPF.
12. In order to prevent the possibility of identical claims of clients of defaulter trading members being paid by multiple exchanges, stock exchanges shall share amongst themselves relevant data w.r.t. clients of defaulter/disabled members within 10 days from the date of disablement in order to identify common clients of such members. Further, stock exchanges shall also at the time of disbursing the claims of the clients of defaulting members share the details of the client viz. PAN, UCC, amount disbursed with the other exchanges.

10.5 Execution of Power of Attorney (PoA) by the Client in favour of the Stock Broker / Stock Broker and Depository Participant

SEBI vide circular no. CIR/MRD/DMS/13/2010 dated April 23, 2010, and circular no. CIR/MRD/DMS/28/2010 dated August 31, 2010, has issued guidelines and clarification for execution of Power of Attorney (PoA) by the client favouring Stock Broker / Stock Broker and Depository Participant to standardize the norms to be followed by stock brokers/ stock broker and depository participants while obtaining PoA from the clients. However, it has been observed that PoA is invariably obtained from the investor as part of the KYC and account opening process. Such PoA executed by clients has further found to have been misused by the stock brokers by taking authorization even for activities other than activities specified in SEBI circular. SEBI vide circular "Execution of Power of Attorney (PoA) by the Client in favour of the Stock Broker / Stock Broker and Depository Participant" dated August 27, 2020, has reiterated the following:

I. PoA is optional and should not be insisted upon by the stock broker / stock broker depository participant for opening of the client account.
II. PoA executed in favour of stock broker / stock broker depository participant by the client shall be utilized

a. For transfer of securities held in the beneficial owner accounts of the client towards Stock Exchange related deliveries / settlement obligations arising out of trades executed by clients on the Stock Exchange through the same stock broker.
b. For pledging / re-pledging of securities in favour of trading member (TM) / clearing member (CM) for the purpose of meeting margin requirements of the clients in connection with the trades executed by the clients on the Stock Exchange.
c. For limited purpose to apply for various products like Mutual Funds, Public Issues (shares as well as debentures), rights, offer of shares, tendering shares in open offers etc.

III. For limited purpose to transfer of funds from the bank account(s) of the clients for the following:
a. For meeting the settlement obligations of the client(s)/ margin requirements of the client(s) in connection with the trades executed by the clients on the stock exchange through the same Stock Broker.
b. For recovering any outstanding amount due from the client(s) arising out of clients trading activities on the stock exchanges through the same Stock Broker.
c. For meeting obligations arising out of the client subscribing to such other products/facilities/services through the Stock Broker like Mutual Funds, Public Issues (shares as well as debentures), rights, offer of shares etc.
d. Towards monies/fees/charges, etc. due to the Stock Broker/Depository Participant/ Principal payable by virtue of the client using/subscribing to any of the facilities/services availed by the client at his/her instance.

IV. All off-market transfer of securities shall be permitted by the Depositories only by execution of Physical Delivery Instruction Slip (DIS) duly signed by the client himself or by way of electronic DIS.

10.6 Execution of 'Demat Debit and Pledge Instruction' (DDPI) for transfer of securities towards deliveries / settlement obligations and pledging / re-pledging of securities[78]

In order to make the process more transparent and simpler, the two conditions as specified in paragraphs II (a) & (b) of section 10.5, is made part of a separate document viz. 'Demat Debit and Pledge Instruction'(DDPI), under which the clients shall explicitly agree to authorize the stock broker/stock broker and depository participant to access their BO account for the limited purpose of meeting pay-in obligations for settlement of trades executed by them. The DDPI shall serve the same purpose of PoA and significantly mitigate the misuse of PoA. The use of DDPI shall be limited only for the two purposes as mentioned in paragraph II (a) & (b) of section 10.5. The client may use the DDPI or opt to

[78] https://www.sebi.gov.in/legal/circulars/apr-2022/execution-of-demat-debit-and-pledge-instruction-ddpi-for-transfer-of-securities-towards-deliveries-settlement-obligations-and-pledging-re-pledging-of-securities_57546.html

complete the settlement by issuing physical Delivery Instruction Slip (DIS) or electronic Delivery Instruction Slip (eDIS) themselves. Hence, with the implementation of this circular, PoA shall no longer be executed for the conditions specified in paragraph II (a) & (b) of section 10.5. For further information participants may refer SEBI circular.

10.7 Risk Disclosure to Client and KYC

10.7.1 Client Onboarding and KYC

This refers only to the opening of accounts for new clients. There are certain procedures to be followed before the account can be opened and the broker can execute the orders of the client. The standard documents which form a part of the account opening kit are:

1) **Client Account Opening Form** which is in two parts. a) Know Your Client (KYC) form capturing the basic information about the client and instruction/check list to fill up the form and b) Additional Document capturing additional information about the client related to trading account.
2) Document stating the **Rights & Obligations of stock broker** and clients for trading on Exchanges (including additional rights & obligations in case of internet/wireless technology based trading).
3) Uniform Risk Disclosure Documents (RDD) for all segments/Exchanges detailing risk associated with dealing in the securities market.
4) Guidance Note detailing Do's and Don'ts for trading on Exchanges for the education of the investor.
5) Document describing the Policies and Procedures of the stock broker
6) A tariff sheet specifying various charges, including brokerage, payable by the client to avoid any disputes at a later date.

In addition to the above documents, the clients should also be provided with the contact details of senior officials (compliance officer in particular) within the stock broking firm and investor grievance cell in the stock Exchange, so that the client can approach them in case of any grievance. Few Documents like Rights and Obligations, RDD and Guidance Note for Do's and Don'ts are provided by the Exchanges in Vernacular languages too.

KYC is an acronym for "Know your Client", a term commonly used for Customer Identification Process. SEBI has prescribed certain requirements relating to KYC norms for Financial Institutions and Financial Intermediaries including Mutual Funds and Stock Brokers to 'know' their clients. This entails verification of identity and address, financial status, occupation and such other personal information as may be prescribed by guidelines, rules and regulation.

SEBI in consultation with Unique Identification Authority of India (UIDAI) also allows brokers to accept e-KYC service provided by UIDAI as a valid process for KYC verification. The information containing relevant client details and photograph made available from UIDAI as a result of e-KYC process shall be treated as sufficient Proof of Identity and Address of the client. However, the client shall have to authorize the intermediary to

access his data through UIDAI system. The intermediary shall perform verification of the client with UIDAI through biometric authentication (fingerprint or iris scanning).

Know Your Customer (KYC) and Customer Due Diligence (CDD) policies as part of KYC are the foundation of an effective Anti-Money Laundering process. The KYC process requires every SEBI registered intermediary to collect and verify the Proof of Identity (PoI) and Proof of Address (PoA) from the investor. The provisions as laid down under the Prevention of Money-Laundering Act, 2002, Prevention of Money-Laundering (Maintenance of Records) Rules, 2005, SEBI Master Circular on Anti Money Laundering (AML) dated February 03, 2023, and relevant KYC / AML circulars issued from time to time shall continue to remain applicable. Further, the SEBI registered intermediary shall continue to ensure to obtain the express consent of the investor before undertaking online KYC. SEBI has also issued circulars/guideline on using of technology innovations which can facilitate online KYC.[79] The broker must ensure that the clients fill-up the KYC form and submit it to them. There are separate forms for individuals and non-individuals. Brokers must also ensure that the documents like PAN, proof of address document, proof of identity, bank account details, authority letter to settle account etc. are submitted along with the KYC forms by the clients. The Broker while onboarding a client should satisfy himself about Know your Customer (KYC) norms and KYC documents of the client.

The stock broker shall have documentary evidence of financial details provided by the clients who opt to deal in the derivative segment. In respect of other clients, the stock broker shall obtain the documents in accordance with its risk management system.
List of Illustrative documents

- Copy of ITR Acknowledgement
- Copy of Annual Accounts
- In case of salary income - Salary Slip, Copy of Form 16
- Net-worth certificate
- Bank account statement for last 6 months
- Copy of Holding statement of de-mat account
- Any other relevant documents substantiating ownership of assets
- Self-declaration along with relevant supporting

SEBI Master Circular on Anti Money Laundering (AML) dated February 03, 2023, has advised member to categorized client as Low Risk, Medium Risk and High Risk based on the due diligence or KYC documents. By classifying the clients under various risk categories, effective monitoring and due diligence can be applied to thwart any illegal/unlawful transactions. The risk category of the client is based on several parameters such as location of client, nature of business activity, volume and value of turnover, nature of transaction, manner of payments, etc. Clients of special category like

[79]https://www.sebi.gov.in/legal/circulars/apr-2020/clarification-on-know-your-client-kyc-process-and-use-of-technology-for-kyc_46565.html

politically exposed person, clients from high risk countries etc. may, if necessary, be classified with an even higher degree of risk.

Unique Client Code (UCC)

In 2001, SEBI made it mandatory for brokers to use unique client codes for all clients.[80] Once the formalities of KYC and other details thereon are complete, each client is assigned a unique client code (UCC) by the broker. This acts as an identity for the client with respect to the broker. SEBI has made it mandatory for all the brokers to use unique client codes for all clients while entering orders on their behalf. It is also mandated by SEBI, that the unique client code should be mapped with the PAN number of the client.

The broker has to provide the Stock Exchange(s) with the UCC and the PAN details of the client(s) before entering into any trade for the client. The Stock Exchanges provide an upload facility to the brokers through which the UCC and other client details are uploaded on the stock exchange platform on a regular basis. Stock Exchanges validate UCC and PAN for all orders in all markets (PRO and CLI) at the time of order entry with the details uploaded by members on Exchange. UCC allotted by the trading member (TM) to the client shall be mapped with the demat account of the client. For mapping Stock Exchanges shall share the UCC data with the Depositories which shall include the PAN, segment, TM/CM code and UCC allotted.

SEBI has advised Stock Exchanges to provide a platform to stock brokers to upload the details of their clients, preferably, in sync with the UCC updation module. Stock Brokers shall upload the details of clients, such as, name, mobile number, address for correspondence and E-mail address. Stock Exchanges shall send details of the transactions to the investors, by the end of trading day, through SMS and E-mail alerts uploaded by the stock-brokers. Stock Brokers shall ensure that the mobile numbers/E-mail addresses of their employees /remisiers/authorized persons are not uploaded on behalf of clients. Stock Brokers shall ensure that separate mobile number/E-mail address is uploaded for each client. However, under exceptional circumstances, the stock broker may, at the specific written request of a client, upload the same mobile number/E-mail address for more than one client provided such clients belong to one family (in case of individual clients) or such client is the authorized person of an HUF, Corporate, Partnership or Trust (in case of non-individual clients).

Following are the additional requirements as per current regulatory framework of SEBI (KYC Registration Agency) Regulations, 2011:

- All members have to be registered with any one or more KRAs registered by SEBI as per the SEBI KRA Regulations 2011.
- KYC for New Clients: a) The Member is to perform the initial due diligence of the new client whose KYC data are not available with the KRAs, upload the KYC information for both individuals and non-individuals with proper authentication on the system of the

[80] SEBI Circular no: SMDRP/Policy/CIR-39/2001 dated July 18, 2001 and Circular SEBI/MRD/SE/CIR-34/2003/29/09 dated September 29, 2003

KRA, furnish the scanned images of the KYC documents to the KRA, and retain the physical KYC documents.

- The Member is to furnish the physical KYC documents or authenticated copies thereof to the KRA, whenever so desired by the KRA.
- A new client can be allowed to start trading / dealing on the exchange platforms through the member as soon as the client is registered by completing the necessary KYC documentation process. However, the Member shall be under obligation to upload KYC details with proper authentication on the system of the KRA, within 10 days of receipt of the KYC documents from the client.
- KYC for existing Clients: (a) With respect to the existing clients, who are presently registered with the members but whose KYC data are not available with any of the KRAs, the member shall upload the KYC information with proper authentication on the system of the KRA, furnish the scanned images of the KYC documents to the KRA and retain the physical KYC documents.
- The members shall also upload the KYC details about their existing clients which are missing/not available with them by calling for the same from their clients.
- The member shall not use the KYC data of a client obtained from the KRA for purposes other than it is meant for; nor shall it make any commercial gain by sharing the same with any third party including its affiliates or associates.
- The Member shall have the ultimate responsibility for the KYC of its clients, by undertaking enhanced KYC measures commensurate with the risk profile of its clients.
- The member shall, at all times, have adequate internal controls to ensure the security and authenticity of data uploaded.

Digital KYC to Persons with Disabilities[81]

The Hon'ble Supreme Court of India in a judgement dated April 30, 2025, emphasized the need for easy access to financial services for persons with disabilities. Accordingly, intermediaries dealing in derivatives must ensure that the process of digital KYC is accessible to persons with disabilities.

Intermediaries shall ensure that:

- An account can be opened with the signature of a guardian;
- eKYC is available for persons with disabilities.
- eKYC requires the applicant to blink his / her eyes as proof of liveliness. A blind person who cannot perform this "proof of liveliness test" should not be denied benefits of eKYC. For such investors, intermediaries may use alternate parameters such as facial expressions, nodding of head, client showing OTP while being clearly visible on screen, real time video recording and displaying copies of documents on the screen etc.

[81] https://www.sebi.gov.in/sebi_data/faqfiles/may-2025/1747995205392.pdf

Trading Preferences by Clients[82]

All stock brokers are mandated to register their new clients on all the active stock exchanges after obtaining the trading preferences as per the format specified in SEBI circular. For existing clients, the stock brokers are mandated to offer them access on all the active stock exchanges for the segments already opted by them, as a default mode, within three months from the effective date of the SEBI circular and inform their respective clients through email / SMS. Clients shall be given a choice to opt out of such access by providing negative consent in this regard. Further, the stockbrokers shall activate / deactivate the segments based on the preference of the clients.

10.7.2 Risk Disclosure

There are many risks involved while trading in Exchange traded derivatives market. It is very important that client should undertake transactions only if understand the nature of the relationship into which you are entering and the extent of their exposure to risk. Client should make aware that trading in Equity shares, derivatives contracts have varying element of risk and is generally not an appropriate avenue for someone of limited resources/limited investment and/or trading experience and low risk tolerance. Client needs to carefully consider whether such trading is suitable for him in the light of his financial condition. Further, client is solely responsible for adverse consequences or loss while trading on stock Exchanges. Client should aware that there can be no guarantee of profits or no exception from losses while executing orders for purchase and/or sale of a derivative contract being traded on stock exchanges. Hence, it is very important that before onboarding client, member should ensure that the client signs a Risk Disclosure Document. By signing, client agrees that he is aware of all the risks involved in derivatives trading.

The Risk Disclosure Document should specify broadly all the key risks while dealing / trading in derivatives markets, specifically mentioning about the following:

a. Price Fluctuation / Market Risk in Spot, Futures, Options or any other derivatives markets
b. Macroeconomic scenarios leading to unexpected price movement arising out of foreign exchange movement, government / central bank policy, global scenario's, etc.
c. Sudden liquidity dries down on any contract leading to adverse movement in prices or higher transaction costs or inability to unwind the position
d. Basis risk vis-à-vis spot prices/rates
e. Risks of position remaining unhedged
f. Risk in short positions in options
g. Broker's credit risk i.e., Counterparty risk
h. Risks arising out of technical snags, operational issues or technology related issues at the brokers' end, Exchange's servers or connectivity related issues in web trade

[82] https://www.sebi.gov.in/legal/circulars/jun-2023/trading-preferences-by-clients_72892.html

i. Other penalties which may arise due to open position limit breaches or margin short fall arising out of sharp fluctuation in market prices

10.7.3 Risks faced by investors trading in Exchange Traded Interest Rate Derivatives markets

- Market Risk: Market risk is the risk of losses on financial investments caused by adverse movement of interest rate or prices of interest rate instruments.
- Liquidity Risk: Liquidity refers to the ability of market participants to buy and/or sell securities / derivatives contracts expeditiously at a competitive price and with minimal price difference. There may be a risk of lower liquidity in some derivatives contracts as a result, client order may only be partially executed, or may be executed with relatively greater price difference or may not be executed at all.
- Leverage Risk: In Exchange Traded Interest Rate Derivatives (ETIRD), the amount of margin is small relative to the value of the derivatives contract, so the transactions are 'leveraged'. ETIRD, which is conducted with a relatively small amount of margin, provides the possibility of great profit or loss in comparison with the margin amount. Due to which transactions in derivatives carry a high degree of risk.
- Execution Risk: There is risk that the buy or sell order placed in ETIRD may not get executed at the desired price due to higher price volatility or due to type of order place. This may result in slippages.
- Basis risk: Basis risk is the potential risk that arises from mismatches in a hedged position. Basis risk occurs when a hedge is imperfect, so that losses in an investment are not exactly offset by the hedge. Basis risk can arise from standardization of derivatives contract for amount and expiry date. For example, you need to hedge an exposure of 900,000, which requires the futures/option contracts of 900,000 / 200,000 = 4.5. Since we can buy or sell only in integral multiples, we need to buy or sell either four or five contracts. The former leads to under-hedging and the latter, to over-hedging. Second, the derivatives contract expires on the last Thursday day of contract month. If the exposure to be hedged has maturity of some other day in the month, there will be mismatch in the maturity. The discrepancy in the amount and maturity of exposure and the futures contract leaves a residual risk called basis risk. There is a third source of basis risk, which is the differential price change in the exposure and futures contract due to mismatch in underlying instrument. For example, in the attempt to hedge against a two-year GOI bond with the purchase of 91 Day Treasury bill futures, there is a risk the Treasury bill and the bond will not fluctuate identically. Basis risk can also arise when the change in future prices and the spot prices of the underlying instrument are not the same. For example, the change in the price of 91-Day Treasury Bills and 91-Day Treasury Bill futures are not the same.
- Risk due to cash settlement: Current ETIRD contracts are mainly cash settled, leads to imperfect hedging or arbitrage.

The list is not exhaustive. It is upon member / client to have a robust framework to identify various risk which may need to go through enhanced due diligence.

10.7.4 Suspicious Transaction Reporting (STR) to Financial Intelligence Unit (FIU)

SEBI Intermediaries including brokers shall monitor transactions of the client to ensure that those are not suspicious from money laundering or tax evasion point of view. The trades like reversal trade, profit transfer trades or trades associated with dabba trades are some of the examples of suspicious trades. FIU is a separate intelligence arm under finance ministry. The brokers are expected to report such transactions to FIU through online mechanism provided by FIU. Though, the Exchange through its surveillance mechanism raise a suspicion about a client's transactions, it is the duty of concerned broker to identify those suspicious transactions through its regular monitoring and report them to FIU. The brokers are not supposed to inform the client about this reporting, as it will lead to tipping-off information to client, which is illegal and not allowed. At the same time, members should not depend solely upon the direction from Exchanges' surveillance mechanism but are required to have their own robust controls and procedures.

Intermediaries shall carefully go through all the reporting requirements and formats that are available on the website of FIU – IND under the Section Obligation of Reporting Entity – furnishing information – reporting format.
(https://fiuindia.gov.in/files/downloads/Filing_Information.html). These documents contain detailed directives on the compilation and manner/procedure of submission of the reports to FIU-IND. The Suspicious Transaction Report (STR) shall be submitted within 7 days of arriving at a conclusion that any transaction, whether cash or non-cash, or a series of transactions integrally connected are of suspicious nature. The Principal Officer shall record his reasons for treating any transaction or a series of transactions as suspicious. It shall be ensured that there is no undue delay in arriving at such a conclusion. The Non-Profit Organization Transaction Reports (NTRs) for each month shall be submitted to FIU-IND by 15th of the succeeding month.

10.7.5 Ease of Doing Investments by Investors-Facility of voluntary freezing/ blocking of Trading Accounts by Clients[83]

To enhance ease of doing business and ease of investment, it has been decided that the framework for Trading Members to provide the facility of voluntary freezing/blocking the online access of the trading account to their clients on account of suspicious activities shall be laid down on or before April 01, 2024, by the ISF, under the aegis of stock exchanges, in consultation with SEBI and the same shall, inter-alia, contain necessary guidelines with respect to the following:

- Detailed policy for voluntary freezing/ blocking the online access of the trading account of the client including the following:
    - modes through which a client can request/communicate to the Trading Member for voluntarily blocking the trading accounts;
    - issuing of acknowledgement to the clients on receipt of message;

[83] Circular SEBI/HO/MIRSD/POD-1/P/CIR/2024/4 dated January 12, 2024

- time period within which the request shall be processed and the trading account shall be frozen/blocked.

- Action to be taken by the Trading Member pursuant to the receipt of request for freezing/blocking of the trading account;
- Process for re-enabling the client for trading/transfers; Intimation to be provided by the trading member to the clients w.r.t. introduction of the facility to block the trading accounts.

Sample Questions

1. Investors can have grievances against _____.
    a. Brokers
    b. Intermediaries
    c. Company
    d. **All of the above**

2. _____ is the fund created to take care of legitimate investment claims, which are not of speculative nature of the clients of defaulting member.
    a. **Investor protection fund**
    b. Investor grievance fund
    c. member default fund
    d. Core settlement guarantee fund

3. Arbitration is a _____ judicial process.
    a. **Quasi**
    b. Fully
    c. Non
    d. None of the above

4. Execution of Power of attorney by the client in favour of stock broker is _____.
    a. Mandatory at the time of placing an order
    b. Mandatory at the time of KYC
    c. **Optional**

5. Subsequent to KYC, broker has to upload the KYC information in _____ system.
    a. Depository
    b. **KRA**
    c. Clearing Bank
    d. SEBI

PLEASE NOTE THAT THESE ARE ONLY SAMPLE QUESTIONS PROVIDED AS A GUIDE TO CANDIDATES AND MAY NOT BEAR ANY RESEMBLANCE TO QUESTIONS IN THE CERTIFICATION EXAMINATION.

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