

R40 Fixed Income Markets: Issuance Trading and Funding

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1. Introduction

This reading will cover:

- How the bond markets are classified.
- Who the major issuers of debt are and what types of bonds they issue.
- How new bond issues are introduced in primary markets and then traded in secondary markets.
- Sovereign bonds and non-sovereign bonds.
- Different types of corporate debt.
- The sources of short-term funding available to banks.

2. Classification of Fixed-Income Markets

2.1 Classification of Fixed-Income Markets

Fixed-income markets are often classified based on the following criteria:

Classification by Type of Issuer

Bond markets may be divided into four categories based on the type of issuers:

- 1) Households
- 2) Non-financial corporates
- 3) Government
- 4) Financial institutions

Classification by Credit Quality

Investors face credit risk, i.e., the risk of loss if the issuer fails to make timely payments of interest and principal as they come due. Rating agencies like Moody's, S&P, and Fitch assign credit ratings to bonds. Bonds with a rating of BBB or above are considered investment grade. Bonds below this rating are considered junk bonds.

This differentiation is important as certain investors such as banks and life insurance companies may not be allowed to invest in junk bonds but only in investment grade bonds.

Classification by Maturity

Fixed-income securities can also be classified by the original maturity of the bonds when they are issued:

- Money market securities: They are issued with a maturity at issuance that ranges from overnight to one year. For example, T-bills issued by the US government or commercial paper with short maturities issued by the corporate sector.
- Capital market securities: The original maturity is usually longer than a year.

Classification by Currency Denomination

Fixed-income securities can also be classified based on the currency in which they are

issued. The bond's price (and cash flows) is affected by the interest rates of the country whose currency the bond was issued in.

Classification by Type of Coupon

Bonds can be classified into the following based on the coupon rate:

- Fixed-rate: In a fixed-rate bond, the coupon rate and coupon payment are fixed.
- Floating-rate: In a floating-rate bond, the coupon payment is linked to a floating rate, which is usually a reference rate plus a spread.

There are two parts to a floating rate: a reference rate and a spread.

The reference rate is reset periodically at the coupon date. As a result, the coupon rate more or less reflects the market interest rates. The reference rate contributes to most of the coupon rate and is usually an interbank offered rate. The most commonly used interbank rate is Libor.

Interbank offered rates are the average interest rates at which banks may borrow unsecured funds from other banks. The rates differ for different periods ranging from overnight to one year. Examples of interbank offered rates include Libor, Euribor (Euro interbank offered rate), Mibor (Mumbai interbank offered rate), etc. The respective currencies for Euribor and Mibor are the Euro and Indian rupee.

The spread, on the other hand, is fixed at issuance and is a function of the issuer's credit quality or creditworthiness. The higher the quality, the lower the spread and vice versa. It is a small component of the coupon rate.

Classification by Geography

Fixed-income markets may be classified based on where the bonds are issued and sold (*we saw this in detail in the previous reading*):

- Domestic bonds: Bonds issued in a country in that country's currency. The issuer is domiciled in that country. For example, Ford issuing U.S. dollar denominated bonds in the U.S.
- Foreign bonds: Bonds issued by an entity domiciled in another country. For example, Toyota issuing dollar denominated bonds in the U.S.
- Eurobonds: International bonds sold outside the jurisdiction of any single country.
- Investors further classify bonds into those issued by developed economies and emerging economies.

Other classifications:

Among other classifications, we have tax-exempt bonds and inflation-linked bonds.

- Tax-exempt bonds: Bonds whose interest/coupon payments are not taxable. For example, munis or municipal bonds issued by local governments in the United States are tax-exempt bonds.
- Inflation-linked bonds: Bonds whose coupon and/or principal are indexed to

inflation. The objective is to give some protection (hedge) to investors against high inflation and offer real returns in a high inflation environment.

2.2 Fixed-Income Indices

Fixed-income indices are used by investors for two purposes: to evaluate the performance of investments and investment managers and to describe a given bond market or sector. The index construction - security selection and weight of each security in the index - varies from index to index.

The most popular fixed-income indices include Barclays Capital Global Aggregate Bond Index, J.P. Morgan Emerging Market Bond Index, and FTSE Global Bond Index.

2.3 Investors in Fixed-Income Securities

Major categories of fixed-income investors include:

- **Central banks:** They use fixed-income securities as a tool to implement monetary policy. Purchasing domestic bonds increases money supply. Similarly, selling bonds decreases money supply. Central banks also buy and sell bonds denominated in other currencies to manage the value of their currency and foreign reserves.
- **Institutional investors:** They are the largest group of investors in fixed-income securities. This includes pension funds, hedge funds, endowments, charitable foundation, insurance companies, and banks. Unlike equities that trade in primary and secondary markets, bonds primarily trade over-the-counter. Many issues are not liquid and tradable, making them out of reach for retail investors, but are preferred by institutional investors.
- **Retail investors:** Unlike central banks and institutional investors, retail investors primarily invest in bonds through mutual funds or ETFs. Many retail investors prefer to invest in bonds because of the certainty of income in the form of interest payments and principal payment at maturity. Also, fixed-income securities are not as volatile as their equity counterparts.

3. Primary Bond Markets

Primary bond markets are markets in which bonds are sold for the first time by issuers to investors to raise capital. Bonds can be sold initially via a public offering or a private placement. Secondary bond markets are markets in which existing bonds are subsequently traded among investors. After the initial offering, bonds are bought and sold among investors in the secondary market.

3.1 Primary Bond Markets

A company/government/any entity issues bonds in two ways: public offering and private placement.

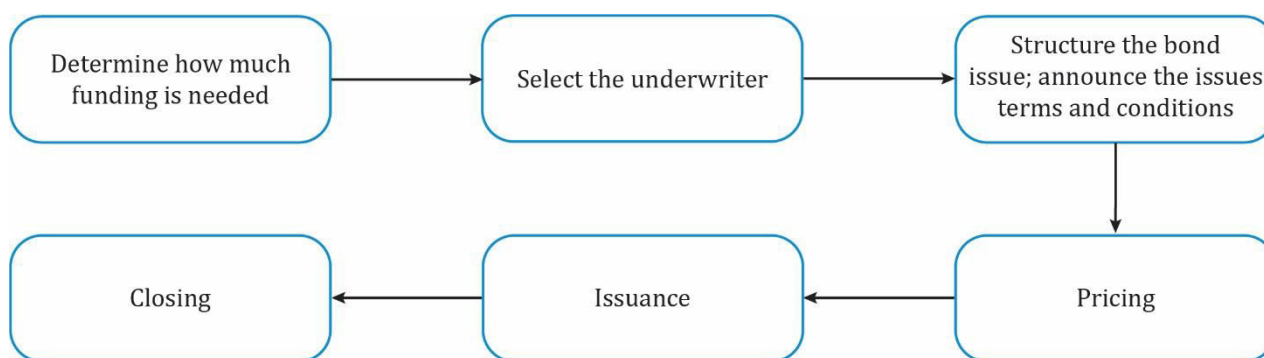
Public Offerings

As the name indicates, in a public offering, any member of the public may invest in a new bond issue. The issuer does not sell bonds directly to each investor. Instead, the issuer avails the services of an intermediary called the *underwriter* to facilitate the selling (placement) process. The underwriter is usually an investment bank because banks have a good understanding of how to market a new issue, can tap their networks to locate investors, and successfully place the issue.

The different bond issuing mechanisms are:

- Underwritten offering
- Best effort offering
- Shelf registration
- Auctions

Underwritten offerings: In an underwritten offering, an investment bank negotiates an offering price with the issuer; the offering price is the price at which the issue will be sold. It then buys the entire issue at the offering price and takes the risk of reselling it to investors or dealers. Underwritten offering is also known as a *firm commitment offering*. The underwriting process is graphically depicted below:



While small-size bond issue may be underwritten by a single investment bank, larger-size bond issues are often underwritten by a group (or syndicate) of investment banks. Such issues are called 'syndicated offerings.' A lead underwritten heads the syndicate and the group collectively establishes the pricing of the issue and takes the risk of reselling it to investors or dealers.

Best effort offering: Contrary to an underwritten offering, in a best effort offering issue, the investment bank acts as a broker and only sells as many securities as it can instead of committing to sell 100% of the issue. The unsold bonds are returned to the issuer. The investment bank gets a commission for bonds sold at the offering price, faces less risk and has less incentive to sell the issue than in an underwritten offering. Best effort offering is usually preferred for riskier issues and corporate bonds.

Shelf registration: Shelf registration is a type of public offering where the issuer is not required to sell the entire issue at once. The issuer files a single document with regulators that describe a range of future issuances. The advantage is that the issuer does not have to

prepare a new document for every bond issue provided there is no change in the issuer's business and financial terms stated in the prospectus. This allows the issuer to save on repeated administrative expenses and registration fees.

Auctions: Government bonds across the world are usually sold to investors via an auction. Governments finance public debt by borrowing money through the central bank. An auction is a public offering method that involves bidding, and is helpful in price discovery and allocating securities. The United States follows a single-price auction method for its sovereign securities such as T-bills, T-notes, TIPS, etc. In this method, all winning bids pay the same price for the security and receive the same coupon rate.

Private Placement

As the name implies, the securities are not sold to the public in this type of funding. Instead, they are sold only to a select group of investors such as institutional investors. Other characteristics are as follows:

- It is typically a non-underwritten, unregistered offering of bonds, i.e., a private issue need not comply with the registration requirements of a public offering such as preparing a prospectus.
- It is also exempt from securities laws that govern a public issue.
- It can be accomplished directly between the issuer and the investor(s) through an investment bank. Because privately placed bonds are unregistered and may be restricted securities that *can only be purchased by some types of investors*, there is usually no active secondary market to trade them.
- Institutional investors such as insurance companies and pension funds are typical investors of privately placed bonds.

4. Secondary Bond Markets

Securities are traded among investors in the secondary market. Large institutional investors and banks are the primary participants. Retail investors are limited here, unlike in the equities market.

Secondary bond markets are structured as organized exchanges or as over-the-counter markets.

- Organized exchange: Where buyers and sellers meet to arrange trades and comply with the rules of the exchange.
- Over-the-counter (OTC) markets: Buy and sell orders are matched through a communications network. Most bond trading happens in the OTC market.

It is important to understand the liquidity of a bond market:

- Liquidity is a measure of how quickly an investor can sell the bond and turn it into cash. Similarly, it should also measure how quickly one can buy a bond to cover a short position.
- Bid-ask or bid-offer spread reflects the liquidity of a market. The lower the spread,

the better the liquidity.

- Most of the liquidity in the international bond market is supplied by Eurobond market makers.

Settlement is the process that occurs after a trade is made:

- It is usually T+1 (a day after the transaction date) for government and quasi-government bonds and T+3 for corporate bonds.
- Cash settlement is one in which cash is paid and bond is received on the same day. It is followed for some government and quasi-government bonds, and money market securities.

5. Sovereign Bonds

Sovereign bonds are issued by national governments primarily for fiscal reasons. Taxes are the primary source of revenue for a government. If tax revenue is insufficient, then a government raises money by issuing sovereign bonds.

Sovereign securities are classified into two categories based on when they were issued: **on-the-run** and **off-the-run**. On-the-run are recently issued sovereign securities that trade frequently. They are also called benchmark bonds because the yields of other bonds are determined relative to these bonds. Off-the-run refers to securities that were issued some time ago. They are less liquid compared to on-the-run securities.

Sovereign bonds are not backed by collateral. Instead, they depend on the taxing authority, i.e., the national government, to repay the debt. Rating agencies distinguish between a sovereign bond issued in local currency and one in foreign currency. Local currency bonds generally have a higher credit rating than foreign currency bonds, because if needed the national government can print local currency to repay the bond, however it cannot print the foreign currency.

Sovereign bonds can be fixed-rate, floating-rate or inflation-linked.

6. Non-Sovereign, Quasi-Government, and Supranational Bonds

6.1 Non-Sovereign Bonds

Non-sovereign bonds are bonds issued by the local governments such as states, provinces, and cities, and not by the national government. The characteristics of non-sovereign bonds are as follows:

- Credit rating is usually high as rate of default is low. However they have a higher credit risk than sovereign bonds and therefore demand a higher yield.
- The source of revenue for these bonds is the local taxing authority and the cash flows from the project once it is commissioned.
- Funds raised from non-sovereign bonds are used for public projects such as highways, bridges, dams, airports, metro, sewage systems, and schools.

6.2 Quasi-Government Bonds

Quasi-government bonds are bonds issued by non-government entities, but they are usually backed by the government. The characteristics of these bonds are as follows:

- The credit risk is low.
- Taxes are not a source of revenue. They fund specific projects and cash flows from the project/entity are used to service the debt.
- Examples are bonds issued by Federal National Mortgage Association (Fannie Mae), Federal Home Loan Mortgage Corporation (Freddie Mac) in the U.S.

6.3 Supranational Bonds

Supranational bonds are bonds issued by international organizations such as the World Bank, IMF, EIB, ADB, etc. They are usually plain-vanilla bonds. Sometimes callable or floaters are also issued.

7. Corporate Debt: Bank Loans, Syndicated Loans, and Commercial Paper

We now shift our focus from sovereign debt to corporate debt. Companies borrow primarily from banks and only 30% of their financing needs come from the financial markets.

7.1 Bank Loans and Syndicated Loans

There are two types of bank loans: bilateral and syndicated.

- A **bilateral loan** is a loan from a single lender to a single borrower.
- A **syndicated loan** is a loan from a group of lenders, called the syndicate, to a single borrower.

Most bilateral and syndicated loans are floating-rate loans, linked to a reference rate such as Libor. For highly rated companies, both bilateral and syndicated loans can be more expensive than bonds issued in financial markets.

7.2 Commercial Paper

A commercial paper is a flexible, readily available, and low-cost instrument issued by companies to meet their *short-term* needs. They are issued for a short period, typically between 15 days and one year.

A commercial paper may be regarded as the corporate equivalent of a T-bill because it is short-term in nature. In a CP, since companies may borrow directly from the market, the cost of borrowing is less than that of banks.

Companies use commercial paper:

- For working capital and seasonal demands for cash.
- As a source of bridge financing: CPs serve as an interim source of funding if market conditions are not temporarily favorable to arrange permanent funding.

The characteristics of a commercial paper are as follows:

- The yield on commercial paper is greater than the yield on short-term sovereign bonds because investors are exposed to credit risk. Credit risk varies from entity to entity.
- Historically, the rate of default of CP is very low as they are short-term in nature, and when CPs mature, they are usually rolled over into new CPs. It is called *rolling over the paper*. The old CP is paid with the proceeds from the new CP. But what if the issuer is unable to issue a new CP? This risk is called *rollover risk*. Rollover risk can be mitigated by what is called backup lines of credit. These are backup funds from the banks to ensure there is enough money to pay off a maturing CP.

US Commercial Paper vs. Eurocommercial Paper

The US commercial paper (USCP) market is the largest commercial paper market in the world. Commercial paper issued in the international market is known as Eurocommercial paper (ECP). The differences between the two are summarized in the table below:

| USCP vs. ECP | | |
|--------------|------------------------------|--------------------------------|
| Feature | US Commercial Paper | Eurocommercial Paper |
| Currency | U.S. dollar | Any currency |
| Maturity | Overnight to 270 days | Overnight to 364 days |
| Interest | Discount basis | Interest-bearing basis |
| Settlement | T+0 (trade date) | T+2 (trade date plus two days) |
| Negotiable | Can be sold to another party | Can be sold to another party |

The key difference between a USCP and ECP is in the way interest is paid. USCP, like a zero bond, is sold at a discount. The par value is paid on maturity. ECP, on the other hand, is sold at par and the interest is paid along with the par value at maturity. The example below illustrates this difference for a \$100 million CP issued at 4% for 90 days.

| \$100 million, 90-day at 4% commercial paper | | |
|--|---|--|
| | USCP: issued by U.S. Bank | ECP: issued by a French company |
| Interest: | $100,000,000 \times 0.04 \times 90/360$ = \$1,000,000 | $100,000,000 \times 0.04 \times 90/360$ = \$1,000,000 |
| At issuance, money received by bank/company | Interest discounted from par: $100,000,000 - 1,000,000 = \$99,000,000$ | Par value: \$100,000,000 |

| | | |
|----------------------------------|---------------------------------|---|
| Bank/company pays at maturity: | Par value = \$100,000,000 | Par value + interest = 10,000,000 + 1,000,000 = \$101,000,000 |
| Return on investment for 90 days | $1,000,000/99,000,000 = 1.01\%$ | $1,000,000/100,000,000 = 1.00\%$ |

8. Corporate Debt: Notes and Bonds

Corporate bonds may be categorized based on several characteristics such as maturities, coupon payment structures, and contingency provisions that we will discuss in this section.

Maturities

Short-term, medium-term, long-term: There is no formal categorization of what constitutes a short-term, medium-term, and long-term security. But we will go with the classification below based on common practice.

| Classification of Corporate Bonds Based on Maturity | | |
|---|-------------|-----------------------|
| Original maturity | Term | What are they called? |
| Five years or less than five years (≤ 5) | Short-term | Notes |
| Greater than 5 and less than 12 years (> 5 and ≤ 12) | Medium-term | |
| Greater than 12 years (> 12) | Long-term | Bonds |

Medium-term note (MTN): The term 'medium' in an MTN is a misnomer because the maturities range from 2 years to greater than 30 years.

- MTNs are continuously offered through dealers or agents.
- MTNs can be broadly classified into short-term, medium to long-term, and structured notes.
- Yield on an MTN is higher than a comparable bond, but liquidity is lesser.
- They primarily serve to bridge the funding gap between commercial papers (short-term) and long-term bonds.

Coupon Payment Structures

Coupon payments for corporate notes and bonds vary based on the type of bond:

Note: We have seen most of these in the previous reading, so we will just skim through them

- Conventional coupon bond/plain vanilla bond: pays fixed-rate coupon periodically.
- Floating-rate note: Coupon payment linked to a reference rate.
- Credit-linked coupon bond: Coupon payment linked to issuer's credit quality.
- Zero-coupon bonds: Pays no coupon; one payment equivalent to par value at maturity.
- Deferred coupon bonds: Pays no coupon initially and a higher coupon later.
- Payment-in-kind coupon bond: Pays coupon in the form of securities, not cash.

Principal Repayment Structures

Broadly speaking there are three types of principal repayment structures. These are outlined below:

1. Serial maturity structure: The bond matures in parts on several dates throughout the bond's life. The principal is repaid in parts instead of paying a lump sum at maturity. For example, if a company issues \$50 million for 5 years, then traditionally it repays the principal of \$50 million at once on maturity date. But in the case of a serial bond issue, assume \$20 million matures after two years, \$10 million in the third year, and so on. Which bonds will be retired at what date, is defined at issuance.
2. Term maturity structure: The bond's entire principal is paid at once on maturity. It carries more credit risk.
3. Sinking fund arrangement: The issuer sets aside funds so that it can retire specific amounts of the principal each year. This is done in two ways: by repaying principal to a certain percentage of bondholders each year, or the issuer may deliver bonds to the trustee equal to the amount that must be retired that year.

Asset or Collateral Backing

Unlike highly-rated sovereign bonds that carry almost no default risk, all corporate bonds have varying amounts of default risk. The objective of asset or collateral backing is to protect investors in the event of a default. Secured debt, i.e., debt backed by collateral, is not completely insulated from losses, but it is considered better than unsecured debt.

Contingency Provisions

Contingency provisions are clauses defined in a bond's indenture to protect the bondholders. These provisions specify under what conditions a bond may be redeemed or paid-off before maturity. Some provisions benefit the issuer while some benefit the investor. The three contingency provisions are call provision, put provision, and a convertible bond.

Issuance, Trading, and Settlement

Major points with respect to issuance, trading, and settlement are given below:

- New bond issues are sold by investment banks who act as underwriters/brokers.
- They are settled through the local settlement system, which in turn is connected to the two primary Eurobond clearing systems: Euroclear and Clearstream.
- Bonds are traded through dealers who make a market. Dealers interact with bondholders and with other dealers. So, it is essentially an over-the-counter market.
- The settlement now happens electronically. For a secondary bond, settlement could take anywhere between $T + 3$ to $T + 7$ days while issuance of a new bond takes several days.
- Bond prices are quoted in basis points.

9. Structured Financial Instruments

Structured financial instruments represent a broad sector of financial instruments including asset-backed securities and collateralized debt obligations. A common characteristic of these instruments is that they repackage and redistribute risks. In this section, we focus on the following four categories of instruments:

9.1 Capital Protected Instruments

Capital protected instruments offer different levels of capital protection, and are only as good as the issuer of the instrument. One example of a capital protected instrument is a guarantee certificate that offers full capital protection. This is achieved by combining a bond and a call option.

For example, consider an investor who has \$100,000 to invest. The investor buys zero-coupon bonds that will pay off \$100,000 after one year. The investor pays \$99,000 for the bond and invests the remaining \$1,000 from the purchase of the bond to buy a call option on some asset that expires one year from now. Now, let us see what happens one year from now when the bond matures. If the price of the underlying asset on the call option increases, the call expires in the money. The investor gets \$100,000 when the bond matures and profits from the call option. If the price of the underlying asset on the call option falls, the call expires worthless. The investor's capital is still protected as he gets \$100,000 when the bond matures and loses the premium paid for the call option. The downside is limited to the \$1,000 premium paid for the call option.

9.2 Yield Enhancement Instruments

Yield enhancement refers to higher risk exposure and possibly a higher expected return. A credit-linked note is an example of a yield enhancement instrument.

The characteristics of a CLN are as follows:

- It pays regular coupons but its redemption value depends on a well-defined credit event such as a ratings downgrade of an underlying reference asset.
- If the event does not occur, then the investor will receive par value at maturity. However, if the event occurs, then the investor receives the par value of the CLN minus the nominal value of the underlying reference asset.
- A CLN therefore allows the issuer to transfer the credit risk to investors. Investors are willing to buy CLNs because they offer higher coupons as compared to otherwise similar bonds.

9.3 Participation Instruments

A participation instrument is a type of instrument that allows investors to participate in the return of an underlying instrument. They give investors indirect exposure to a particular index or asset price. A floating-rate bond is an example of a participation instrument whose coupon rate adjusts periodically to a pre-defined formula. Thus, floaters allow investors to

participate in the movements of interest rates.

Most participation instruments are designed to give investors indirect exposure to an equity index, a specific stock, or to the price of another asset. Unlike capital-protected instruments that offer equity exposure, participation instruments typically do not offer capital protection.

9.4 Leveraged Instruments

Leveraged instruments are structured financial instruments that offer higher returns for small investments. An example of a leveraged instrument is an inverse floater. Unlike a traditional floater, the cash flows are inversely related to changes in the reference rate. When the reference rate decreases, the coupon payment of an inverse floater increases.

$$\text{Inverse floater coupon rate} = C - (L * R)$$

where:

C = the maximum coupon rate reached if the reference rate is equal to zero

L = the coupon leverage. This indicates the multiple the coupon rate will change for a 100 basis points change in the reference rate

R = the reference rate on the reset date

Inverse floaters with a coupon leverage rate greater than 0 but lower than 1 are known as deleveraged inverse floaters. Inverse floaters with a coupon leverage rate greater than 1 are known as leveraged inverse floaters.

10. Short-Term Bank Funding Alternatives

This section looks at where banks get their funds from in the short-term.

10.1 Retail Deposits

One of the primary sources of funds for a bank is the money deposited by retail (like you and me) and commercial investors in their accounts. It is the lowest possible source of funding for a bank. The three types of retail accounts and characteristics of each of these accounts are discussed below:

Demand deposits or checking accounts

- Depositors have access to funds anytime.
- The funds may be used to pay for transactions.
- Little or no interest is paid.

Savings accounts

- Depositors have access to funds.
- Unlike checking account, savings accounts pay an interest. But they do not offer the same transactional convenience.

Money market accounts

- Funds are available at short or no notice.
- Offer money market rates of return.

10.2 Short-Term Wholesale Funds**Central Bank Funds**

- When a bank receives deposits from customers, a certain percentage of this money must be kept as a reserve with the national central bank. The amount a bank keeps as reserves varies based on its financial position: some have a deficit and some have a surplus.
- The funds stashed in the central bank by all banks are collectively known as the central bank funds market.
- Assume a bank is running low on cash and a customer wants to withdraw money from this bank. The bank has two choices. It may withdraw cash from its reserve account in the central bank to pay the customer, if it has sufficient funds. Or it may borrow money from banks that have a surplus in their accounts at the central bank. The funds, known as central bank funds, may be borrowed for a period up to one year at rates known as central bank funds rates.
- If the borrowing is for one day, it is called overnight funds. If it is for more than one day, then it is called term funds.

Interbank Funds

- Banks lend to and borrow from each other in the interbank market.
- It is an unsecured system of lending.
- The term may vary from overnight to one year.
- The reference rate at which they borrow is called the interbank offered rate. Or, they may borrow at a fixed interest rate.
- Often large banks publish two rates: one at which they borrow and one at which they lend.

Certificates of Deposit

- A certificate of deposit is a savings instrument with a maturity date, a fixed interest rate, and can be issued in any denomination. The investor or bearer of the certificate receives an interest at the end of the deposit period. CDs can be issued to individuals, companies, trusts, funds, etc.
- There are two forms of CD: negotiable and non-negotiable CD.
- In a non-negotiable CD, the interest and deposit are paid at maturity. There is a penalty if the depositor withdraws funds before maturity.
- In a negotiable CD, depositors are allowed to sell the deposits before maturity.
- There are two types of negotiable CDs:
 - Large-denomination CDs: CDs of denomination of \$1 million or more; often

- traded among institutional investors.
- Small-denomination CDs: of lower denominations and meant for retail investors.

11. Repurchase and Reverse Repurchase Agreements

A repurchase agreement or repo is a sale and repurchase agreement. It is an agreement between two parties where the seller sells a security with a commitment to buy the same security back from the purchaser at an agreed-upon price at a future date. It is similar to borrowing funds against collateral. Assume there are two parties: banks A and B. A has a 90-day T-bill that it sells to B for \$99.50. It agrees to buy the same T-bill the next day for \$99.51. This was a means of borrowing \$99.50 overnight for A. The 1¢ can be considered as the interest for the borrowed amount.

Structure of Repurchase and Reverse Repurchase Agreements: We will look at some terms related to repo with the help of the A and B example we saw earlier.

- Reverse repo: It was a repo arrangement from bank A's (seller of security) perspective. But from bank B's perspective (purchaser of security), it is a reverse repo.
- Repurchase price: The price at which A will buy back the security from B the next day is called the repurchase price. The price at which the dealer repurchases the security is called the repurchase price.
- Repurchase date: The date on which the dealer (A) repurchases the security (from B) is called the repurchase date. In our example, it was the next day.
 - *Overnight repo*: If the repurchase happens the next day, i.e., if the agreement is for one day, it is called overnight repo.
 - *Term repo*: If the repurchase happens after more than a day, it is called term repo.
 - *Repo to maturity*: If the agreement is honored until maturity, then it is called repo to maturity.
- Repo rate: The interest rate negotiated between both the parties is called the repo rate. In our example, 1¢ was the interest paid.

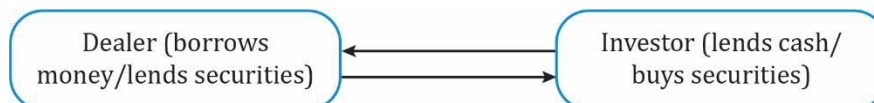
The factors that affect the repo rate include:

- *The risk of the collateral*: Highly rated collateral such as sovereign bonds exhibit low risk and lower repo rates.
- *Term of the repurchase agreement*: The longer the term, the higher the rates.
- *Delivery requirement*: If the collateral is delivered to the lender, the rates are lower. If the underlying collateral is not delivered to the counterparty, then the risk is higher and so is the repo rate.
- *Supply and demand*: Collateral in high demand has lower repo rate. If the collateral is scarce/low supply, the repo rate is lower.

- Interest rates of alternative financing.

Credit Risk Associated with Repurchase Agreements

Both the parties in a repo agreement face the risk of default from the counterparty. There is credit risk even if the collateral is a highly rated sovereign bond. Let us analyze what happens when each party defaults.



If the dealer defaults and cannot repurchase the collateral:

- The investor keeps the collateral and retains any income from the same.
- The investor is at a disadvantage if the price of the collateral falls below the repurchase price (owed by the dealer).

If the investor defaults and cannot deliver the collateral:

- The dealer keeps the cash.
- The dealer is at a disadvantage if the price of the collateral rises above the price quoted in the repurchase agreement. The dealer now holds less cash than the collateral's current value.
- The lender of funds carries a greater credit risk than the dealer. In order to protect the investor, usually the amount lent is lower than the market value of the collateral.
- Haircut or repo margin = market value of security (collateral) – amount lent to dealer
- The amount of difference or repo margin depends on:
 - *Length* of the repo. The longer the duration of the repo, the higher the risk and greater the margin.
 - *Quality* of the security used as collateral: The higher the quality, the lower the margin.
 - *Creditworthiness* of the dealer: The higher the creditworthiness, the lower the margin.
 - *Supply and demand*: If the collateral is in high demand / low supply then the repo margin is lower.

Summary

LO.a: Describe classifications of global fixed-income markets.

Fixed-income markets are often classified based on the following criteria:

- The type of issuer: This can be further divided into four categories based on the type of issuers: households, non-financial corporates, government, and financial institutions.
- The bond's credit quality. The bonds must be classified based on their creditworthiness such as investment-grade, high-yield, or junk bonds.
- Maturity: Long term, medium term, short term.
- Currency denomination.
- Type of coupon: Bonds pay either a fixed rate or a floating rate of interest.
- Geography: Based on where the bonds are issued and sold.
- Other classifications: Among other classifications, we have inflation-linked bonds and tax-exempt bonds.

LO.b: Describe the use of interbank offered rates as reference rates in floating-rate debt.

Interbank offered rates are the average interest rates at which banks may borrow unsecured funds from other banks. The rates differ for different periods ranging from overnight to one year. Examples of interbank offered rates include Libor, Euribor (Euro interbank offered rate), Mibor (Mumbai interbank offered rate), etc. In a floating-rate bond, the coupon payment is linked to a floating rate that is usually a reference rate plus a spread. The reference rate contributes to most of the coupon rate and is usually an interbank offered rate.

LO.c: Describe mechanisms available for issuing bonds in primary markets.

Primary markets are markets in which bonds are sold for the first time by an issuer to raise capital. Bonds may be issued in the primary market through a public offering or a private placement.

Public offering: Any member of the public may buy the bonds.

Four types are:

- Underwritten offerings: The investment bank buys the entire issue and takes the risk of reselling it to investors or dealers.
- Best effort offerings: The investment bank serves only as a broker and sells the bond issue only if it is able to do so.
(Underwritten and best effort offerings are frequently used in the issuance of corporate bonds).
- Shelf registrations: The issuer files a single document with regulators that allows for additional future issuances.

- **Auction:** Price discovery through bidding. It is frequently used in the issuance of sovereign bonds.

Private placement: Securities are not sold to the public directly, instead the entire issue is sold to a qualified investor or to a group of investors (typically, large institutions).

LO.d: Describe secondary markets for bonds.

Secondary markets are markets in which existing bonds are subsequently traded among investors. Most bonds are traded in over-the-counter (OTC) dealer markets. Some bonds are traded on public exchanges. Institutional investors are the major buyers and sellers of bonds in secondary markets.

LO.e: Describe securities issued by sovereign governments

Sovereign bonds are issued by national governments, primarily for fiscal reasons. Recently issued sovereign securities are called on-the-run. Off-the-run refers to securities that were issued some time ago. Sovereign bonds are not backed by collateral. Instead, they depend on the taxing authority to repay the debt. The types of sovereign bonds include fixed-rate bonds, floating-rate bonds and inflation-linked bonds.

LO.f: Describe securities issued by non-sovereign governments, quasi-government entities, and supranational agencies.

Non-sovereign bonds are issued by local government instead of national government. They have a higher credit risk than sovereign bonds and therefore demand a higher yield.

Quasi-government bonds or agency bonds are issued by quasi-government entities. These are not government entities, but they are usually backed by the government. The credit risk is low. They fund specific projects, and cash flows from the project are used to service the debt.

Supranational bonds are issued by international organizations such as the World Bank, IMF, EIB, ADB, etc. They are usually plain-vanilla bonds. Sometimes callable or floaters are also issued.

LO.g: Describe types of debt issued by corporations.

Debt issued by companies includes the following types:

Bank loans and syndicated paper: A bilateral loan is a loan from a single lender to a single borrower. A syndicated loan is a loan from a group of lenders, called the syndicate, to a single borrower.

Commercial paper: It is a flexible, readily available, and low-cost instrument issued by companies to meet their *short-term* needs.

Corporate notes and bonds: Corporate bonds can be categorized as short-term, medium-term, and long-term security. Coupon payments for corporate notes and bonds vary based on the type of bond. Principal repayment can be based on serial maturity structure, term

maturity structure, and sinking fund arrangement. Corporate bonds have a varying amount of risk so they are backed by collateral to protect the investors. These bonds can have a call provision, a put provision, or can be convertible bonds.

LO.h: Describe structured financial instruments

Structured financial instruments include:

- Capital Protected Instruments
- Yield Enhancement Instruments
- Participation Instruments
- Leveraged Instruments

LO.i: Describe the short-term funding alternatives available to banks.

Retail Deposits: One of the primary sources of funds for a bank is the money deposited by retail investors in their accounts. The three types of retail accounts are demand deposits, saving accounts, and money market accounts.

Central bank funds: When a bank receives deposits from customers, a certain percentage of this money must be kept as a reserve with the national central bank. The funds stashed in the central bank by all banks are collectively known as central bank funds market.

Interbank Funds: Banks lend to and borrow from each other in the interbank market. It is an unsecured system of lending and the term may vary from overnight to one year.

Certificate of deposit: It is a savings instrument with a maturity date, a fixed interest rate, and can be issued in any denomination. The investor or bearer of the certificate receives an interest at the end of the deposit period. There are two forms of CD: negotiable and non-negotiable CD.

LO.j: Describe repurchase agreements (repos) and the risks associated with them.

A repurchase agreement or repo is a sale and repurchase agreement. It is an agreement between two parties where the seller sells a security with a commitment to buy the same security back from the purchaser at an agreed-upon price at a future date. The interest rate negotiated between both the parties is called the repo rate.

A haircut or repo margin is the difference between the market value of security (collateral) and the amount lent to the dealer. Repurchase agreements are a common source of funding for dealer firms and are also used to borrow securities to implement short positions. If you look at the agreement from a lender's perspective, it is a reverse repo agreement.

Practice Questions

1. Which of the following *best* describes a bond issued internationally, outside the jurisdiction of any one country?
 - A. Eurobond.
 - B. Foreign bond.
 - C. Dual currency bond.
 2. An appropriate reference rate for a floating rate note should *least likely* match the note's:
 - A. maturity.
 - B. currency.
 - C. reset frequency.
 3. In which of the following principal repayment structures bond's entire principal is paid at once on maturity?
 - A. Serial maturity structure.
 - B. Sinking fund arrangement.
 - C. Term maturity structure.
 4. In which type of primary market transaction does an investment bank buy and resell the newly issued bonds to investors or dealers?
 - A. Single-price auction.
 - B. Best effort offering.
 - C. Underwritten offering.
 5. Transactions in the secondary bond market *most likely* take place through:
 - A. dealer markets.
 - B. brokered markets.
 - C. organized exchanges.
 6. Which of the following *best* describes sovereign bonds?
 - A. Bonds backed by the revenues of a specific project of a local government.
 - B. Bonds backed by the collateral of a national government.
 - C. Bonds backed by the taxing authority of a national government.
 7. A bond issued by a multilateral agency such as the International Monetary Fund (IMF) is *best* described as:
 - A. non-sovereign government bond.
 - B. supranational bond.
 - C. quasi-government bond.
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8. A bond issue where the specific bonds that will mature and be paid off each year before final maturity is not known, *most likely* has a:
 - A. term maturity
 - B. serial maturity
 - C. sinking fund arrangement.
9. Compared to sovereign bonds, non-sovereign bonds with similar characteristics *most likely* trade at:
 - A. a higher yield
 - B. a higher price.
 - C. a lower yield.
10. Which of the following statements about negotiable certificates of deposits is *most* accurate?
 - A. They are typically available in small denominations.
 - B. They can be sold in the open market prior to maturity.
 - C. A significant penalty is imposed if the depositor withdraws funds prior to maturity.
11. The repo margin on a repurchase agreement is *most likely* to be higher when:
 - A. the underlying collateral is in short supply.
 - B. the maturity of the repurchase agreement is short.
 - C. the credit risk associated with the underlying collateral is high.
12. Short term wholesale funds are *most likely* to include:
 - A. reserve funds.
 - B. checking accounts.
 - C. money market accounts.

Solutions

1. A is correct. Eurobonds are issued internationally, outside the jurisdiction of any single country. B is incorrect because foreign bonds are considered international bonds, but they are issued in a specific country, in the currency of that country, by an issuer domiciled in another country. C is incorrect because dual currency bonds make coupon interest payments in one currency and the principal repayment at maturity in another currency.
2. A is correct. An appropriate reference rate for a floating-rate note should match its currency and the frequency of rate resets, such as 6-month U.S. dollar Libor for a semiannual floating rate note issued in U.S. dollars.
3. C is correct. In a term maturity, bond's entire principal is paid at once on maturity. It carries more credit risk. In a serial maturity structure, the bond matures in parts on several dates throughout the bond's life. The principal is repaid in parts instead of paying a lump sum at maturity. A sinking fund arrangement allows for the retirement of bond on an annual basis based on a random drawing.
4. C is correct. In an underwritten offering the investment bank purchases all of the bond issue and resells it to the investors or dealers.
5. A is correct. Transactions in the secondary bond market primarily take place through dealers.
6. C is correct. Sovereign bonds are usually unsecured obligations of the national government. They are not backed by collateral, but by the taxing authority of the national government.
7. B is correct. Bonds issued by multilateral agencies that operate across national borders are called supranational bonds.
8. C is correct. In a serial maturity structure, the bondholders know in advance which bonds will be retired. In contrast, the bonds retired annually with a sinking fund arrangement are designated by a random drawing. A is incorrect because a bond issue with a term maturity structure is paid off in one lump sum at maturity.
9. A is correct. Non-sovereign bonds usually trade at a higher yield and lower price than sovereign bonds with similar characteristics.
10. B is correct. A negotiable certificate of deposit (CD) allows any depositor (initial or subsequent) to sell the CD in the open market prior to maturity. A is incorrect because negotiable CDs are mostly available in large (not small) denominations. C is incorrect because a penalty is imposed if the depositor withdraws funds prior to maturity for non-

negotiable (instead of negotiable) CDs

11. C is correct. The repo margin is the difference between the market value of the underlying collateral and the value of the loan. The repo margin is typically higher when the credit risk associated with the underlying collateral is high. The repo margin is typically lower if the underlying collateral is in short supply (or if there is a high demand for it) and when the maturity of the repurchase agreement is short.
12. A is correct. Wholesale funds available for banks include reserve funds, interbank funds, and certificates of deposit. Retail funds include Demand deposits or checking accounts, Savings accounts, Money market accounts.