Fixed-Income Markets: Issuance, Trading and Funding

Abstract

Contents

12a	Calculate and interpret price, income and cross-price elasticities of demand and describe factors that affect each measure
12b	Compare substitution and income effects
12c	Distinguish between normal goods and inferior goods
12d	Describe the phenomenon of diminishing marginal returns
12e	Determine and interpret breakeven and shutdown points of production
12f	Describe how economies of scale and diseconomies of scale affect costs

- What are the key bond market sectors?
- How are bonds sold in primary markets and traded in secondary markets?
- What types of bonds are issued by governments, government-related entities, financial companies and non-financial companies?
- What additional sources of funds are available to banks?

1. Overview of Global Fixed-Income Markets

1.0.1 Classification by Type of Issuer

There are essentially four bond market sectors: **households**, **non-financial corporate**, **financial institutions** and **government**. Each sector can be broken down in emerging or mature markets.

% of GDP	Households	Non-Financial Corporates	Government	Financial Sector	Total
United States	76.4	72.3	101.0	80.0	329.7
Japan	54.7	98.8	223.8	149.2	526.5
United Kingdom	86.3	84.2	104.8	180.9	456.2
China	49.2	162.9	47.8	39.4	299.3
South Korea	95.6	99.2	37.9	82.6	315.3
Brazil	24.9	44.3	83.9	33.8	186.9
Mexico	16.5	27.4	35.4	16.8	96.1
Israel	42.3	69.7	60.3	9.6	181.9
Nigeria	3.9	13.6	24.3	3.0	44.8

Figure 1

1.0.2 Classification by Credit Quality

Bond markets are classified based on the issuers credit worthiness as judged by credit rating agencies. Credit ratings are either **investment grade** or **non-investment grade**, *high yield*, *speculative investment* or *junk*.

One of the reasons this distinction is so important is because some institutional investors are prohibited or restricted in exposure to lower-quality, high yield securities. For example, regulated banks and insurance companies are limited to very highly rated securities. This important notion makes investment-grade bonds more liquid than high yield bonds.

1.0.3 Classification by Maturity

This distinction is mainly implied in *money market securities*, ranging from overnight to one year and *capital market securities* which have longer maturities than 1 year.

1.0.4 Classification by Currency Denomination

The critical aspect about current denomination is the way interest rates affect bond prices, in addition to, in the case of sovereign securities, the ability to create money.

% of GDP	Households	Non-Financial Corporates	Government	Financial Sector	Total
United States	76.4	72.3	101.0	80.0	329.7
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Figure 2. Local Currency (LC) and Foreign Currency (FC)

1.0.5 Classification by Type of Coupon

Differentiation between fixed rate of interest, floating-rate (FRN's).

Banks profit from interest rates, that is, from the difference between the interest rate they raise funds and the interest rate at which they invest those funds. Therefore, banks are highly exposed to interest rate risk - the risk of a mismatch between borrowed and lent funds.

In order to minimize such risks, banks prefer floating-rate loans and invest in floating-rate bonds.

Reference rates The coupon rate of a floating rate bond is typically expressed as a reference rate plus a spread or margin. Different reference rates can be used depending on where the bonds are issued and their currency denomination. The **London interbank offered rate** (Libor) has been the reference rate for many floating-rate bonds, in particular for US and Eurobond markets. The libor is a collective name for multiple rates. It reflects the rate at which a panel of banks (used to be BBA - British Banker's Association) believe they could borrow unsecured funds from other banks in the London interbank money market for different currencies.

1.0.6 Classification by Geography

Distinction between domestic, foreign and Eurobonds markets.

1.1 Investors in Fixed-Income Securities

There are different types of investors in fixed-income securities such as *central banks, institutional investors* and *retail investors*. Both central banks and institutional investors invest directly in fixed-income securities while retail investors generally prefer to invest through mutual funds or ETF's.

Central banks use *open market operations* to implement monetary policies. OMO refer to the purchase or sale of bonds, usually high quality sovereign bonds in order to increase or decrease the monetary base in the economy. Central banks can also buy foreign currency denominated securities (bonds) in order to manage the relative currency value and foreign currency reserves.

Fixed-income markets are dominated by institutional investors partially because of the high information barrier and high minimum transaction sizes. Fixed-income securities are far more diverse than equity. However, unlike equity which is easily traded in organized markets, the issuance and trading of bonds is dominated by **over-the-counter markets** (OTC).

2. Primary and Secondary Bond Markets

2.1 Primary Bond Markets

Issuance in primary bond markets can be sold via public offering or private placements.

2.1.1 Public Offerings

The issuance of fixed-income securities is often if not always assisted by an investment by. The issuing mechanisms of PO are **underwritten offerings**, **best effort offerings** and **auctions**.

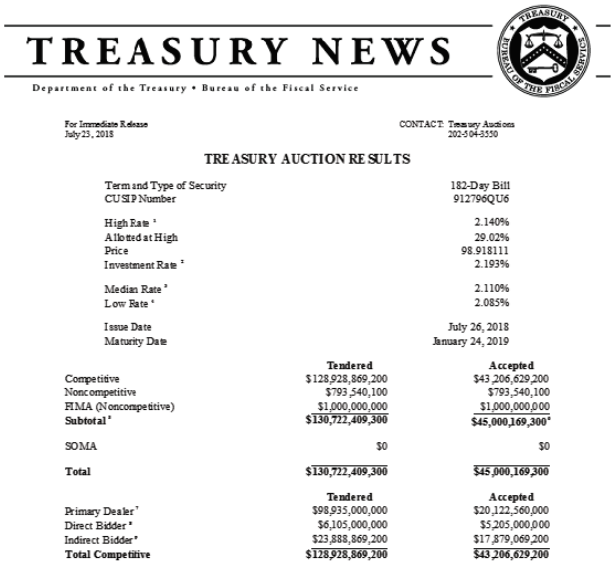
Underwritten Offerings include six phases:

- 1) Determination of the funding needs; how much money must be raised, the type of bond offering and whether if the issuance should be underwritten
- 2) Selection of the underwriter, typically an investment bank. **Underwriter's revenue** is the difference between the price at which they purchase the bond issue and the price of reselling to bank's investors. In some cases, for large bond issues, there can be a **syndicate offerings** - a group of banks organized by the *lead underwriter* which provide the underwriting services.
- 3) Structure the transaction, discussing terms of coupon rate, expected offering price, regulatory fillings. The issuer must also choose a *trustee*.
- 4) The announcement specifies the new bonds features, terms and conditions. The issuer also releases a offering circular or prospectus - which is a document that helps sell the bonds.
- 5) *Pricing day* - the last day when investors can commit to buy the bond issue and the final day the terms of the bond are agreed on. Then the next day is called the offering day and the underwriting process enter the *issuing phase*, where issuers start selling the bonds through its network.
- 6) About 14 days later the process comes to an end on the *closing day*, when bonds are delivered to investors.

Shelf Registration A shelf registration allows certain authorized issuers to offer additional bonds to the general public. Shelf registrations are subject to less requirements and lower level of scrutiny compared with standard public offerings so it is only an option for well-established issuers.
Shelf registration are usually restricted to qualified and institutional investors.

Auctions An auction is a method involving bidding and it's the most common way of selling sovereign bonds to the public.
The public action process can be **single-price auction** or **multiple-price auction**. A single-price auction uses the auction to find a unique price discovery, where all bidders price converge and thus they all get the same coupon rate. In a multiple-price auction, the process generates multiple prices and yields for the same bond issue.
Illustration of the US auction process.

- **Announcement phase** - the US Treasury announces the auction and provides information about the bond issue, such as the amount of securities to be sold, auction date, issue date, maturity date, etc.
- **Bidding phase** - after the auction announcement is made, dealers and institutionals (and individuals) enter in competitive or non-competitive bids. With competitive bids, a bidder specifies the yield that he is willing to accept: if the rate determined at auction is not within the acceptable range, investors will not be offered any securities.
  In contrast, non-competitive bids agree to accept the rate determined at auction so they will always receive their securities.
  The US Treasury accepts all non-bidding offers and competitive bids in ascending order (from lowest to highest) until the amount of bids equals the amount the issuer requires.
- **Issuing day** - in the issuing day, the US Treasury delivers the securities to the winning bidders and collects the proceeds from investors. After the auction process is complete, the securities are traded in secondary markets like other securities.



TREASURY NEWS

Department of the Treasury • Bureau of the Fiscal Service

For Immediate Release
July 25, 2018

CONTACT: Treasury Auctions
202-504-3550

TREASURY AUCTION RESULTS

Term and Type of Security	182-Day Bill
CUSIP Number	912796QU6
High Rate [1]	2.140%
Allotted at High	29.02%
Price	98.918111
Investment Rate [2]	2.193%
Median Rate [3]	2.110%
Low Rate [4]	2.085%
Issue Date	July 26, 2018
Maturity Date	January 24, 2019

	Tendered	Accepted
Competitive	$128,928,869,200	$43,206,629,200
Noncompetitive	$793,540,100	$793,540,100
FIMA (Noncompetitive)	$1,000,000,000	$1,000,000,000
Subtotal [5]	**$130,722,409,300**	**$45,000,169,300 [6]**
SOMA	$0	$0
Total	**$130,722,409,300**	**$45,000,169,300**

	Tendered	Accepted
Primary Dealer [7]	$98,935,000,000	$20,122,560,000
Direct Bidder [8]	$6,105,000,000	$5,205,000,000
Indirect Bidder [9]	$23,888,869,200	$17,879,069,200
Total Competitive	**$128,928,869,200**	**$43,206,629,200**

Figure 3. Results of a US Treasury Auction

The rate determined at auction was 2,140% although the median rate was 2.110%. Because T-bills are pure discount bonds, they are issued at discount to par value and redeemed at par. Investors paid 98.9181% of par. The US Treasury received 130 billion in bids but only raised 45 billion.

2.1.2 Private Placements

A private placement is an unregistered offering of bonds only sold to an investor or a small group of investors. Typically investors in privately placed bonds are large institutional investors. A private placement can be accomplished directly between the issuer and the investors.

There are usually no secondary markets for private placement securities, but these securities can be traded among qualified institutional investors.

2.2 Secondary Bond Markets

Secondary markets also called *aftermarkets* are where existing securities are traded among investors.There are two fundamental structures of secondary markets: organized exchanges and over-the-counter markets.

An organized exchange provides a place where buyers and sellers can meet to arrange their orders subject to the restrictions of the exchange, not only regarding the trading and rules of trade but the securities itself, whereas in OTC markets securities are unregulated and are operated through dealers.

Settlement occurs in a T+1 basis for government and quasi-government bonds or on a T+0 (cash basis). Corporate bonds usually take settle on a T + 2 or T + 3 basis.

3. Sovereign Bonds

3.1 Characteristerics of Sovereign Bonds

Sovereign bonds denominated in local currency have different names: US Treasuries in US, Japanese government bonds (JPG), gilts in UK, bunds in Germany and obligations assimilables du Trésor (OAT's) in France.

Names also vary depending on the maturity of the bonds: T-bills have maturities of 1 year or shorter, T-notes have maturities of 1-10 years and Treasury bonds (T-bonds) have maturities longer than 10 years. The latest sovereign bond issue for a give maturity also called **on-the-run** are referred as the **benchmark issue** because it servers as a benchmark against which to compare bonds that have the same features.

3.2 Credit Quality of Sovereign Bonds

Sovereign bonds are usually unsecured obligations - they are not backed by collateral of the issuer but by the taxing authority of the national government, at least in the short term. The main source of payments for the funds borrowed are either from tax revenues or from rolling over (refinancing) existing debt.

Credit quality is rated by credit rating agencies, making distinction between bonds issued in the sovereign's local or foreign currency as it affects credit quality. A national government can have the ability to print its currency to finance domestic currency denominated debt or financing foreign currency denominated debt by having a positive net trade balance or trading in financial markets.

4. Non-sovereign Government, Quasi-Government and Supranational Bonds

4.1 Non-Sovereign Bonds

Non-sovereign bonds are those bonds issue by organizations below national level, such as provinces, regions, states and cities. These bonds are typically used to finance public projects such as schools, motorways, hospitals, etc. The sources of payments can be cash flows from the projects or special taxes os fees established for that specific purpose. Non-sovereign bonds can or cannot be guaranteed by the national government.

4.2 Quasi-Government Bonds

Quasi-government organizations (government sponsored entities) have both public and private sector characteristics, but they are not actually government entities. The main difference between non-sovereign and quasi-government bonds is that quasi-government bonds do not offer an explicit guarantee by the national government.

4.3 Supranational Bonds

Supranational bonds are issued by supranational agencies also referred as multilateral agencies. The most well-known agencies are the World Bank Group (and International Bank for Reconstruction and Development), IMF and European Investment Bank (EIB).

5. Corporate Debt

The ways to finance corporate debt vary among countries and regions. European companies meet 75% of their borrowing needs from banks and only 25% from financial markets, however, in the US debt capital is 80% sponsored by financial markets and 20% from bank lending.

5.1 Bank Loans and Syndicated Loans

A **bilateral loan** is a loan from a single lender to a single borrower. Bank loans are the primary source of debt financing for small and medium-size companies as well as for large companies in countries where bond markets are underdeveloped.

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

5.2 Commercial Paper

Commercial paper is a short-term, unsecured promissory note issued in the public market or via a private placement.

5.2.1 Characteristerics of Commercial Paper

Commercial paper is a valuable source of flexible, ready available and relatively low cost short term financing. The maturity of commercial paper ranges between overnight and 1 year. It is mainly used as the funding for working capital and seasonal demands for cash. It is also a source of *bridge financing* - temporary funds that can be arranged until permanent financing can be arranged.

For example, if the market conditions for long-term debt issuing is unfavorable, the company may opt to raise funds with commercial paper and wait out a more favorable environment.

Credit Quality	Moody's	S&P	Fitch
Superior	P1	A1+/A1	F1+/F1
Satisfactory	P2	A2	F2
Adequate	P3	A3	F3
Speculative	NP	B/C	F4
Defaulted	NP	D	F5

Figure 4. Commercial Paper Ratings

In most cases, maturing commercial paper is paid with the proceeds of new issuances of commercial paper (*rolling over the paper*). As a safeguard against rollover risk, credit rating agencies often require commercial paper issues to secure backup lines of credit from banks, in order to ensure sufficient liquidity to repay maturing commercial paper if rolling over isn't an option.

Commercial paper is less risky because it has a short maturity and thus, the market adapts quicker to a change in an issuer's credit quality than do the markets for longer securities.

5.2.2 US Commercial Paper and Eurocommercial Paper

US Commercial Paper (USCP) is the largest commercial paper market in the world. The **Eurocommercial paper** (ECP) is the international market of commercial paper.

Feature	US Commercial Paper	Eurocommercial Paper
Currency	US dollar	Any currency
Maturity	Overnight to 270 days[a]	Overnight to 364 days
Interest	Discount basis	Interest-bearing or discount 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

[a] In the United States, securities with an original maturity greater than 270 days must be registered with the Securities and Exchange Commission (SEC). To avoid the time and expense associated with a SEC registration, issuers of US commercial paper rarely offer maturities longer than 270 days.

Figure 5. USCP and ECP

A difference between USCP and ECP is related to the interest provision. USCP issues on a discount basis (issues at discount to par) while ECP may be issued at yields basis or discount basis.

5.3 Corporate Notes and Bonds

5.3.1 Principal Repayment Schedules

Corporate note or bond issues have either a serial or a term maturity structure. With a **serial maturity structure**, maturity dates are spread out during the bond's life - a stated number of bonds mature and are paid off before the final maturity. The **term maturity structure**, the bond's principal is paid off in a lump sum at maturity.

Because of the regular payment schedule before maturity, serial maturity bonds are safer than term maturity bonds.

6. Structured Financial Instruments

Structured financial instruments represent a broad sector of financial instruments, including asset-backed securities (ABS) and collateralized debt obligations (CDO's). Structured financial instruments have usually a combination of bonds and at least one derivative. In short, the bond's payment features are replaced from the traditional issuer's cash flows but from the performance of the underlying asset.

6.1 Capital Protect Instruments

Suppose an investors hast 100k to invest. The investor buys zero coupon bonds issued by a sovereign issuer that will pay off 100k. Lets supposed it costs 99k. The investor can then used the additional 1k left to buy a call option in some underlying asset.

The zero coupon provides an hedge (capital protection): that is, even if the call option expires worthless, the investor will retain its 100k at the end of the period.

The combination of the zero-coupon bond and the call option can be prepackaged as a structured financial instrument called **guarantee certificate**.

6.2 Yield Enhancement Instruments

A **credit-linked note** (CLN) is an example of a type of bond which depends on a well defined credit event, such a credit downgrade or default of the underlying asset, called the *reference asset*.

6.3 Participation Instruments

A **participation instrument** is one that allows investors to participate in the return of an underlying asset - just like floating-rate notes where the reference asset is the Libor.

6.4 Leveraged Instruments

Leveraged instruments are structured financial instruments designed to magnify returns and risk, offering the possibility of an higher payroll. Inverse floater is an example of a leveraged instrument.

7. Short-term Funding Alternatives Available to Banks

7.1 Retail Deposits

One of the primary sources of funding for deposit banks is their retail deposit base which includes both funds from individual and commercial depositors. There are several types of retail deposit accounts, however. *Demand deposits* also known as *checking accounts* are available to customers on demand and therefore, deposit accounts typically pay no interest.

In contrast, *savings accounts* allow depositors to accumulate wealth in a very liquid form but do not offer the same convenience and liquidity as checking accounts. *Money market accounts* are an intermediate account between demand deposit and savings accounts.

7.2 Short-term Wholesale Funds

These include reserve funds, interbank funds and certificates of deposit.

7.2.1 Reserve Funds

Many countries require deposit banks to place a reserve balance with the national bank in order to ensure sufficient liquidity should depositors require withdrawal of funds.

The treatment on reserve funds varies among countries. It can offer low interest rates, no interest or even negative rates (charges for keeping the funds). In addition, banks incur an economical cost - the opportunity cost that these funds can't be invested in higher interest rate activities, like loans to consumers or enterprises.

Banks with deficit or surplus of reserve funds can loan/borrow those funds in the **central bank funds market** at the **central bank funds rate** - Fed funds rate in the US.

7.2.2 Interbank Funds

The interbank market is the market of loan and deposits between banks. The term to maturity from these operations range from overnight to one year. The rate on an interbank loan or deposit can be quoted relative to a reference rate, such as the interbank offered rate - large banks will make a two-way price, indicating the rate at which it will lend funds and the rate at which it will borrow funds.

7.2.3 Certificates of Deposit

A **certificate of deposit** (CD) is an instrument that represents a specified amount of funds on deposit for a specific maturity and interest rate. CF's can take one of two forms: *non-negotiable CD's* and *negotiable*.

In a non-negotiable CD the deposit plus interest are paid at maturity and a withdrawal penalty is imposed if the depositor withdraws funds prior to maturity. Alternatively, a negotiable CF allows any depositor to sell the CD in the open market prior to the maturity date.

There are two types of negotiable CD's: *large denomination CD's* and *small denomination CD's*.

7.2.4 Repurchase and Reverse Repurchase Agreements

A repurchase agreement or repo is the sale of a security with simultaneous agreement by the seller to buy the same security back from the purchaser at an agreed-on price and future date. In practical terms, a repurchase agreement can be viewed as a collateralized loan in which the security sold and subsequently repurchased represents the collateral posted.

Structure of Repos and Reverse Repos A repurchase agreement is constructed as follows: the dealer sells 2.25% US Treasury securities to a counterparty for cash. At the same time, the dealer makes a promise to buy the same securities the next business day for an agreed on price - the **repurchase price** or **repo rate**. The following date, in the scenario, is the **repurchase date**. The dealer who gets cash (borrower) for the securities is doing a **repurchase agreement** while the institution which borrows the cash is doing a **reverse repurchase agreement**. The repurchase or inverse repo depends only on the lens of transaction parties.

When the maturity of repos is one they they are called *overnight repo*; when the maturity is more than one day it is a *term repo*. Several factors can affect the repo rate:

- Risks associated with the collateral - repo rates are lower for highly liquid and highly rated collateral such as sovereign bonds AAA
- The term of the repurchase agreement. Repo rates generally increase with maturity.
- Supply and demand of collateral. The more in demand a specific piece of collateral, the lower the repo rate against it. The demand for desired collaterals are called *on special*, while other collateral is called *general collateral*
- Interest rates of alternative financing in the money market

To reduce credit risk, the amount lent is lower than the collateral market value and this difference between the market value of the securities used as collateral and the value of the loan is know as **repo margin** or **haircut**.

References

[cfa, 2019] 2019. *CFA program curriculum*. CFA Institute.