SS13 Fixed-Income

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# READING 42. FIXED INCOME SECURITIES: DEFINATION

* 1. Describe basic features of a fixed-income security
  2. Bond price, yields, ratings:
     + Issuers of bonds
       - Original maturity longer than 1yr is **capital market security**.
       - Surety bond: reimbues investors for any loss incurred if default.
       - Consol: no stated maturity date.
       - Covered bond: debt obligation backed by a segregated pool of assets(cover pool), so when collateral non-performing, issuer must replace it.
       - Equipment trust certificate: bonds secured by specific types of equipment or physical assets, such as shipping containers.
     + Bond maturity: **tenor**(time remaining until maturity)
     + Par value
     + Coupon payment
       - plain vanilla of fixed coupon rate
       - **Pure discount** bonds of zero-coupon bond: earn on implied basis
     + Currencies
  3. Describe content of a bond indenture
  4. Compare affirmative and negative covenants and identify examples of each
  + 
    - Issuing entities: structured finance sector, not corporate
    - Sources of repayment
    - Collateral and credit enhancement
  + Trust deed/bond indenture : legal contact between the bond issuers (borrower) and bondholders (lender). The provisions in the bond indenture = covenants:
    - **Negative** covenants: prohibitions on the borrower
    - **Affirmative** covenants: actions the borrower promises to perform
  + Internal credit enhancement: subordination(aka credit tranching,), overcollateralization, reserve accounts/funds; external: a letter of credit, surety bond, cash collateral account.
  + Describe how legal, regulatory, and tax considerations affect the issuance and trading of fixed-income securities
  + **Eurobonds** -typically bearer bonds(no trustee owner): international bond issued outside jurisdiction of any one country and not denominated in the currency of issue country. **Foreign** bonds: debt securities issued in domestic market by foreign-domiciled issuers. **Global** bonds: issued simultaneously in Eurobond market and at least a domestic market.

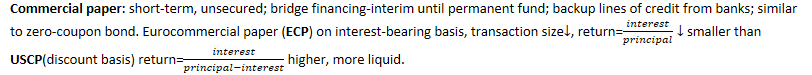
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| --- | --- |
|  | Geographic classification of bonds  Eurobonds  Issuer  domicile  Currency  Jurisdiction  Domestic bonds  Same as country  of issuance  Foreign bonds  Different from country of issuance  Domestic (local) currency  Domestic legal, requlatorv, and tax rules  Foreign currency  Numerous exemptions |

* + Describe how cash flows of fixed-income securities are structured
  + Principal repayment structures: **bullet** bond(**plain vanilla**): entire payment of principal at maturity; **amortizing** bond: periodic payments of interest and repayments of principal - **fully** and **partially**(fixed periodic pmt but only a portion of principal repaid by maturity, thus a **balloon** payment required at maturity to retire the outstanding principal amount).
  + **Sink fund** arrangements: to periodically to retire bond's principal outstanding, segregate cash reserve to repay of bond's trustee, reduce credit risk. COUPON structures:

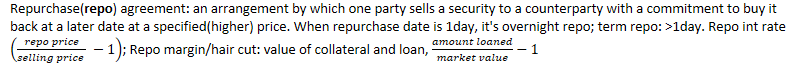
Credit nsk of 
Jssuer 
Credit risk of 
reference 
Discount Margin 
"Quoted Margin" 1.7% 
Fixed Margin 
180-day LIBOR 
2.0% 

* + Floating-rate notes (**FRN**) or floaters: LIBOR +n%
    - Reference rate (current market rate of interest) + interest **quoted margin**; usually pay quarterly. Quoted Margin > Discount Margin, price at premium.
    - **Cap** of the highest coupon rate, prevent rising above max,
    - **Floor** of lowest to prevent reference rate falls below min.
    - 
  + Variable-rate note
  + 
    - Coupon rate increasing by specific margins at specific dates over time
    - Call feature allowing to redeem at a set price
  + **Credit-linked** coupon bond: changes when bond's credit rating changes.
  + Payment-in-kind (**PIK**) bond - high leverage
  + **Deferred coupon** bond/**split** coupon bond
    - Payment don’t begin till later
  + Index-linked bond
    - Coupon payments or principal based on commodity index or equity index or index
    - Inflation-linked bonds (linkers)
    - Principal protected bonds, indexed bond that will not pay less than original par, when index decreasing
    - Indexed-annuity
    - Indexed zero-coupon
    - Interest-indexed
    - Capital-indexed
  + Describe contingency provisions affecting the timing and/or nature of cash flows of fixed-income securities and identify whether such provisions benefit the borrower or the lender
  + **Embedded option**: various contingency provisions found in indenture of bond, right to do. (no warrant) Price of callable bond = price of (option-free bond - embedded call option)
    - American: at any time starting on first call/put date
    - European: only once on the date
    - **Bermuda**: on specified dates following the protection period
    - Straight or option-free bonds: no contingency provisions (also embedded options)
    - **Convertible** bond
      1. Conversion price: price at which bond converted to common stock
      2. 
      3. Conversion value: market value of shares that received upon conversion, (current share price) × (conversion ratio) = par value
      4. Conversion premium: diff convertible bond's price & conversion value
      5. Conversion parity: conversion price = convertible bond's price; positive premium means **below** parity
    - Contingent convertible bond: bonds with contingent write-down provisions, convert from debt to common equity

# READING 43. FIXED-INCOME MARKETS

* + Describe classifications of **global fixed-income markets**
  + Type of issuer
  + **Credit equality**: S&P, Moody's, Fitch
  + Original **maturities**
    - **Money market** securities: original of 1yr or less
    - Capital market securities: > 1yr
  + Coupon structure: floating-rate/fixed-rate
  + **Currency** denomination
  + Geography: developed markets/emerging markets
  + Indexing
  + Tax status - **municipal bonds(munis)** are tax exempt sold by gov
  + **High yield** debt = **speculative** = non-investment grade = **junk** bonds = below Baa3/BBB-
  + Describe the use of interbank offered rates as reference rates in floating-rate debt
  + **Short-term alternative funding to BANKS**
    - Customer deposits(retail deposits)
    - Checking acct + Savings acct
    - Money Market mutual funds
    - Certificates of deposit(CDs)
    - Negotiable CDs
    - **Interbank** funds: borrow excess reserves from other banks in central bank funds market; Interbank offered rates: major banks can borrow unsecured funds from others in money market for different currencies & periods overnight to 1yr (X 10yr)
    - 
  + Describe mechanisms available for issuing bonds in primary markets
  + Describe secondary markets for bonds
  + Primary market: sales of newly issued bonds;
    - Public offering: new sales to public. Book building (book runner, accelerated book build): process of gathering **indications of interest**.
      1. **Underwritten**, firm commitment offering: IB guarantee sale@ negotiate price
      2. **Best efforts** offering: IB=broker only, not obligated to buy unsold portion if undersubscribed issue
      3. **Syndicated** offering: entire bond issue underwritten by a **group** of IBs
    - Grey market: traded on a when-issued basis
    - 
    - Shelf registration: allow authorized issues to offer additional without prepare new separate offering circular for each bond issue
    - Private placement: sold only to qualified investors, selling on commission basis
  + Secondary market: trading previously issued bonds, bid-offer/bid-ask spread, **settlement**
  + Describe securities issued by sovereign governments
  + **Sovereign** bonds: unsecured obligations of national gov, can be fixed, floating, inflation-indexed bonds. Original maturity <1yr mostly is zero-coupon instrument.
  + Describe securities issued by non-sovereign governments, quasi-government entities, and supranational agencies
  + **Non-sovereign**(local gov) bond: issued by states, provinces, counties, cities, entities; payment = revenues of this project, tax revenues
  + Agency or **quasi-gov** bond: entities owned or sponsored by national gov
  + **Supranational** bonds: by multilateral international agencies, ie. world bank, IMF
  + Describe types of debt issued by corporations
  + Bilateral: single lender to single borrower; syndicated: loan from group of lenders
  + 
  + Serial **maturity** structure: redeeming part of bond issue periodically; **Term maturity**: bond principal paid off in a lumps sum on the same date of maturity; settle on T+2 or T+3 basis and thru paperless, computerized book-entry basis. Asset/collateral backing, contingency provisions, issurance, trading, settlement.
  + Medium-term notes (MTN): maturity ranges, 5-12yr.
  + Describe **structured financial instruments**
  + Asset-backed securities(ABS), collateralized debt obligations(CDO)
  + **Capital** protected: guarantee certificate-combine zero-coupon bond w call option; **Yield** enhancement: credit-linked note(**CLN**-pay all as promised if credit event don't occur); Participation, **Leveraged** instrument: inverse floater, can be deleverage by (0<n<1)\*LIBOR
  + Describe short-term funding alternatives available to banks
  + Retail deposits: demand deposits(checking accounts), money market accounts;

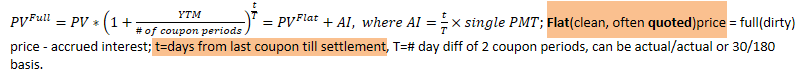
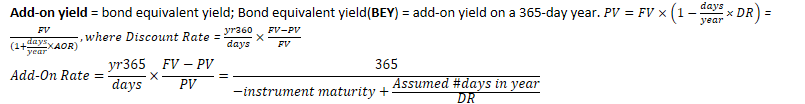
**Wholesale** funds: reserve funds, central bank funds, interbank funds, large-denomination negotiable Certificates of Deposit.

* + Describe repurchase agreements (repos) and the risks associated with them
  + 

Those 2 rates higher, when longer the repo term, the lower the credit quality, the lower the int rate [repo lower when security is delivered to the lender, repo margin lower when the security is in high demand or low supply]

* + 

# READING 44. INTRODUCTION TO FIXED INCOME VALUATION

* + Calculate a bond’s price given a market discount rate
  + Identify the relationships among a bond’s price, coupon rate, maturity, and market discount rate (yield-to-maturity)
  + 
    - Bond price and market discount rate move inversely, nonlinear but curved relation.
    - 
    - **Coupon** effect: **lower**-coupon bonds have more price volatility, ceteris paribus.
    - **Maturity** effect: **longer**-term bonds have more price volatility, ceteris paribus.
  + Define spot rates and calculate the price of a bond using spot rates
  + 
  + Describe and calculate the flat price, **accrued interest**, and the full price of a bond
  + No-arbitrage price of a bond: using spot/market price, where YTM discounted is different.
  + 
  + Describe matrix pricing
  + Calculate annual yield on a bond for varying compounding periods in a year
  + 
  + True yield: using actual calendar of weekends and holidays for coupon payment dates; street conversion: neglect weekends and holidays.
  + 
  + 
  + Option-adjusted yield = current flat price + call option. Option-adjusted yield < YTM for a callable bond. Callable bond Value(option-adj price) = bond value - embedded call value.
  + Yield-to-worst: lowest of sequence of yields-to-call(**YTC** oncall) and yield-to-maturity(YTM)
  + Calculate and interpret yield measures for fixed-rate bonds and floating-rate notes
  + Calculate and interpret yield measures for money market instruments
  + 
  + Define and compare spot curve, **yield curve** on coupon bonds, par curve, forward curve
  + **Spot** yield curve: aka zero, stripped curve, a sequence of YTM on zero-coupon bonds. Can calculated as **geometric** average of short-term forward rages, **interconnect** forward curve.
  + **Par** curve: par bond yield curve, a sequence of YTM that each bond is priced at par; not calculated from actual bonds YTM but constructed from the spot curve of same credit risk. Shows relationship between yield-to-maturity and time-to-maturity.
  + **Forward** curve: forward rate is additional yield for future period, each w same time frame.
  + Define forward rates and calculate spot rates from **forward rates, forward rates from spot rates**, and the price of a bond using forward rates
  + **Short-term forward rate & spot rate:** 1stN length of forward period from today, 2nd tenor

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| --- | --- |
| 0y1y | One-year **spot** rate |
| 1y1y | One-year **forward** rate maturing in 1 year |
| 2y1y | Two-year forward in 1 year |
| 2y5y | Two-year into five-year rate |







* + Compare, calculate, and interpret yield spread measures
  + Yield spread: difference between the yields of 2 different bonds, quoted in basis points
    - Benchmark spread, G-spread (actual or interpolated gov treasury)
    - Special G-spread: don't match an on-the-run(mostly recent) gov bond but quoted relative to an "interpolated gov bond yield"
    - **I-spread** (aka Interpolated spreads): over standard interest swap rate of same tenor
    - Asset swap: converts periodic fixed coupon to a LIBOR ± spread (measure credit risk)
    - Zero-volatility, z-spread: shape of benchmark yield curve, constant yield over govnm or interest rate swap spot curve.
    - Option-adjusted spread (**OAS**) = Z-spread - option value (in basis points per year): callable bond: ZS>OAS; puttable bond: ZS<OAS.
    - Comparison: if bond's spread higher, undervalued; lower means overvalued.
    - Percentage price change is greater (in absolute value) when market discount rate goes down than goes up.

Q-67. 
Using the following US Treasury forward rates, the value of a 2.5-year $100 par value 
Treasury bond with a 5% coupon rate is closest to: 
Forward 
Rate 
1.20% 
1.80% 
2.30% 
2.70% 
3.00% 
A. 
B. 
c. 
Period 
1 
2 
3 
4 
5 
$104.87. 
$101.52. 
$106.83. 
years 
0.5 
1 
1.5 
2 
2.5 

Q-47. 
Assume a $1,000,000 par value, semiannual coupon U.S. Treasury note with two years 
to maturity and a coupon rate of 10 percent. Using the following Treasury spot rates 
and ignoring accrued interest and transactions costs, the arbitrage-free value of the 
A. 
B. 
c. 
Treasury note is closest to: 
Maturity 
Six months 
Twelve months 
Eighteen months 
Twenty-four months 
$846,210. 
$1,002,648. 
Spot Rate (%) 
6.00 
7.50 
9.00 
10.00 







