

Fixed Income Securities

BUSS254 Investments

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Lecture Outline

- Coupon bonds vs. Zero (coupon) bonds
- Zero prices and zero (spot) rates
- Forward rates
- Yield to Maturity
- Swap rates
- Interest rate risk: measurement and management
- Term structure of interest rates

Fixed Income: Basics

Fixed Income Securities

- A promise to deliver future known cash flows.
 - Examples: money market instruments, treasury bonds, notes, and bills, corporate bonds etc.
- Terminologies
 - Indenture: contract between issuer and holders specifying interest, principal, and other items (covenants).
 - Par (Face) value: the amount of money paid at maturity.
 - Maturity: the end date of the security's life.
 - Coupon payments: interest payments made periodically through the life of the security.
 - * $\text{Coupon rate} = \text{Coupon} / \text{Par value}$

- * $\text{Current yield} = \text{Coupon} / \text{Price}$
- Yield to Maturity: the internal rate of return (IRR) of a bond investment

Types of Bonds

- Callable bonds
 - The issuer can repurchase the bond at a specified call price before the maturity.
 - Deferred callable bonds: come with a period of call protection (not-callable period).
 - Puttable bonds: gives the issuer the option
- Convertible bonds
 - Give bondholders an option to exchange each bond for a specified number of shares of common stock (conversion ratio)
 - Deferred callable bonds: come with a period of call protection (not-callable period).
- Floating-Rate Bonds
 - Coupon rate varies inversely with a benchmark interest rate.
- International bonds
 - Foreign bonds: foreign issuer issues in domestic currency
 - * Yankee, Samurai, Bulldog, Dim-sum bonds etc.
 - Eurobonds: issue in foreign country with domestic currency
 - * Eurodollar, Euroyen, Euro-euro etc.

Types of Bonds (cont'd)

- Asset-Backed Bonds
 - The income from a specified group of assets is used to service the debt.
 - Business revenue: movie sales, real estate etc.
- Catastrophe Bonds
 - Payments halted/cancelled if earthquake, terror, pandemic etc.
- Indexed Bonds

- Payments tied to an index
- Treasury Inflation Protected Securities (TIPS).

Coupon Bonds

- The quoted coupon rate is annualized.
 - If the quoted coupon rate is c , and bond maturity is time T , then each \$1 par value (quantity) of the bonds pays out cash flows (number of payments per year: N)

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graph LR
  A[0] --> B(0.5)
  B --> C(1)
  C --> D(...)
  D --> E(T)

  style A fill:#f9f,stroke:#333,stroke-width:2px
  style E fill:#f9f,stroke:#333,stroke-width:2px

  subgraph Cash Flows
    A1[ ]:::hidden --> B1[c/N]
    B1 --> C1[c/N]
    C1 --> D1[...]:::hidden
    D1 --> E1[$1+c/N]
  end

  classDef hidden fill:#fff,stroke:none,opacity:0
```

- Institutionally speaking, the prices of government bonds form the basis for the pricing in fixed income markets.
- All other fixed income instruments, including derivatives, are priced in relation to the prices of these benchmark bonds