Treasury Debt Instruments

- T–Bills: 91 days to 1 year
  - $10,000 minimum
  - Income exempt from state and local taxes
- T–Notes Up to 10 years
- T–Bonds from 10 to 30 years

- $10,000 T–Bill sold at $9,600 matures in 182 days.
- Bank Discount Yield

$$D = \frac{F - P}{F} * \frac{360}{n}$$

- Bond Equivalent Yield

$$\left[\frac{F}{P} - 1\right]\left[\frac{365}{n}\right]$$

- Federal Agency Debt:
  - Federal Home Loan Bank (FHLB)
  - Federal National Mortgage Association: FNMA (Fannie Mae)
  - Government National Mortgage Association: GNMA (Ginnie Mae)
  - Federal Home Loan Mortgage Corporation: FHLMC (Freddie Mac)

- Municipal Bonds: Munis

- Certificates of Deposit

- Commercial Paper

- Banker's Acceptance

- Repurchase agreements

- Federal Funds: Funds in the bank's federal reserve account

- Libor: London Interbank Offer Rate

Bond Prices

$$\sum_{t=1}^{2T} \frac{c_t}{(1 + r_t/2)^t}$$

- 5% coupon compounding at 10% annualized rate, matures in 1 year.

- Zero Coupon, 30 year compound at 10% annualized

Yield to Maturity

$$\sum_{t=1}^{2T} \frac{c_t}{(1+y/2)^t} = P$$

- 8% 30 year $1,276.76 $1,000 par

- 1 year selling at par 20% coupon

- 30 year $80 annual selling at par

- 8% 30 year $1150 $1,000 par, callable in 10 years at $1,100

- 9% coupon, issued 20 years ago with 10 years left, Expected to repay 70% of Par

The Yield Curve

- The Term structure of interest rates
- Spot rates

- Forward rates

Time	Spot (Annualized)	Forward
6 months	10.00	
1 Year	10.5	
18 months	10.8	
2 years	11.0	
2.5 years	11.1	

Constructing a Yield Curve

- **BOND 1:** due in 6 months with a 10% annual coupon, Price=100
- **BOND 2:** due in a year with an 8% annual coupon, Price=96.369

$$D_1 =$$
$$D_2 =$$

$$\begin{pmatrix} D_1 \\ D_2 \end{pmatrix} = \begin{bmatrix} \quad & \quad \end{bmatrix}$$