Class Notes 1. Interest Rates and Bond Pricing

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Present Discounted Value

- In class we will go over the following concepts.

  In TAs's sections, the TAs will solve numerical exercises.

- **Present Discounted Value:** If the interest rate is i, then

$$PV_t = \frac{Flow_{t+j}}{(1+i)^j}$$

Coupon Bond and YTM

- **Coupon Bond**: Pays a coupon (C) every period and at maturity, pays the "face value" of the bond (F).
  Has a price that can vary over time P_t

- **Yield to maturity** is the value of i that solves:

$$P_t = \frac{C_{t+1}}{1+i} + \frac{C_{t+2}}{(1+i)^2} + \ldots + \frac{C_{t+n}}{(1+i)^n} + \frac{F}{(1+i)^n}$$

Perpetuity, Consol, and Current Yield

- **Perpetuity or consol:** It's a special type of coupon bond that pays C forever. If the interest rate will be constant, the price of a consol is

$$P = \frac{C}{i}$$

- **Current Yield:** It's the ratio of the coupon to the bonds' price. It approximates the yield to maturity of a long-term bond, so it's a useful shortcut.

$$i^c = \frac{C}{P}$$

- **GENERAL POINT:** There is an inverse relation between the bond price and the yield to maturity.

Other Types of Bonds

- Zero-coupon bonds: Only pays F at maturity.
- Amortizing Mortgages: $F = 0$. For given loan amount and i determine annual payment.

Risky Bonds

- How to determine the price of a bond with risky payoffs?
- Consider a one-period bond that pays F next period.
- Suppose the interest rate on a "riskless" one-period bond is i

How to Read Bond Tables

- Table from WSJ Market Data Center

	MATURITY MONTH/YEAR		COUPON	BID	ASKED	CHG	ASK YLD
Bond A	Aug	2015	4.250	112:08	112:10	+8	1.7066
	Mar	2016	2.375	101:28	101:29	+9	2.0190
	Aug	2016	3.000	104:27	104:28	+12	2.1451
	Feb	2025	7.625	147:08	147:11	+16	3.4610
	Aug	2029	6.125	132:26	132:29	+15	3.7047

Figure: Treasury Bonds and Notes

- Bond A (5-year T-notes) matures on August 15, 2015, and has a coupon rate of 4.250%, so it pays \$42.50 each year on its \$1,000 face value.
- Prices are reported per \$100 of face value. For Bond A, 112:08 means 112 and 08/32, or a price of \$1,122.50 for this \$1,000 face value bond.