Bond Prices and Yields

• Two dimensions”
  – **Default Risk** (not all issuers are alike! e.g. Argentina vs Switzerland)… poor Italian grandmothers…
  – (*) **Maturity** (length of time over which the bond promises to make payments)
    • The Yield Curve (term structure of interest rates)
  – Figure 15-1
Bond Prices

• A bond that promises one payment of a $100 in $n$ year is worth $P_n(t)$ at time $t$:

$$P_n(t) = \frac{100}{(1+i(t)) \ldots (1+i^e(t+n-1))}$$

If $i$ is constant,

$$P_n(t) = \frac{100}{(1+i)^n}$$
The Yield Curve

- The **yield to maturity** on an n-tear bond is the **constant** interest rate that makes the bond price today equal to the present value payments of the bond (sort of an “average”):

  \[
  \frac{100}{(1+i_n(t))} = \frac{100}{((1+i(t))..(1+i^c(t+n-1)))}
  \]

  Approx: \( i_n(t) \approx \frac{(i(t) + i^c(t+1)+...)/n}{n} \)

  Easy example: If \( i^c(t+s) = i \Rightarrow i_n(t) = i \)

  Back to Figure 15-1 / Figures 15-3, 15-4, 15-5
Stocks

- Figure 15-6
- Equity finance: dividends -> EPDV
- \[ P(t) = \frac{d^e(t+1)}{1+i(t)} + \frac{d^e(t+2)}{(1+i(t))(1+i^e(t+1))} + \ldots \]
  \[ [n \to \text{infty}] \]
The Stock Market and Economic Activity

• A monetary expansion: Figure 15-7
• An increase in consumer spending: Figure 15-8
• Summary: The role of expectations is key.
Bubbles

• Fundamental vs Bubbles

\[ P(t) = \left( d^e(t+1) + P(t+1) \right)/(1+i(t)) \]

• Tulipmania: 1,500 guineas in 1964... to 7,500 by 1967 (the price of a house) ... a few years later, 10% of the the 1967 price.

• MMM Pyramid in Russia: Sold shares promising a rate of return of 3,000% per year! In six months, P went from 1,600 rubles to 105,000 rubles... ... the company didn’t produce anything! It crashed... and Mavrody became a politician...