

Lecture 13

Money and Banking, Econ 345

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Summary so far

- So far: money and other assets are perfect substitutes
 - Money coexists with other assets that yield *real return* r if

$$\frac{n}{\mu} = r$$

- Today: money and other assets are not substitutes
 - money yields lower real return than other assets
- We want to study effect of inflation on nominal and real rates of return
 - need to assume that money is held despite lower return because it is required by law

Nominal interest rates

- (Gross) Nominal interest rate R_t : number of dollars paid in interest for each dollar of an asset
- most assets and interest rates are nominal - mortgages, treasury bills, Bank of Canada's nominal rate, etc.
- (Gross) Real interest rate r_t : the rate of return in units of good.
- What's the relationship between nominal and real interest rates for d dollars of a nominal asset (e.g., loan):

$$r_t = \frac{\text{return in goods}}{\text{investment in goods}} = \frac{R_t d / p_{t+1}}{d / p_t} = R_t \frac{p_t}{p_{t+1}}$$

or

$$R_t = r_t \frac{p_{t+1}}{p_t}$$

Example 6.2 from CF

- Suppose the fiat money stock changes according to the rule $M_t = 1.5M_{t-1}$ and the number of young people born in each generation evolves according to $N_t = 1.25N_{t-1}$. Let the gross real interest rate be 1.1.
- a) Gross inflation rate $\pi = \frac{\mu}{n} = \frac{1.5}{1.25} = 1.2$, net inflation rate is then 20%.
- b) Gross real return on fiat money is $\frac{1}{\pi} = \frac{1}{1.2}$, net return is then $\frac{1}{1.2} - 1 = 0.83$
- c) Gross nominal interest rate is $R = r\pi = 1.1 * 1.2 = 1.32$

Anticipated inflation and Nominal Interest Rate

- What is the effect of anticipated inflation on nominal interest rate?
- Assume capital pays constant real return x
- By rate-of-return equality, real interest rate is constant as well

$$r = x$$

- Then by the above equation

$$R = r + \pi$$

- Hence nominal interest rate rises with inflation to keep real interest rate constant, *Fisher effect*

Nominal interest rate vs inflation rate

