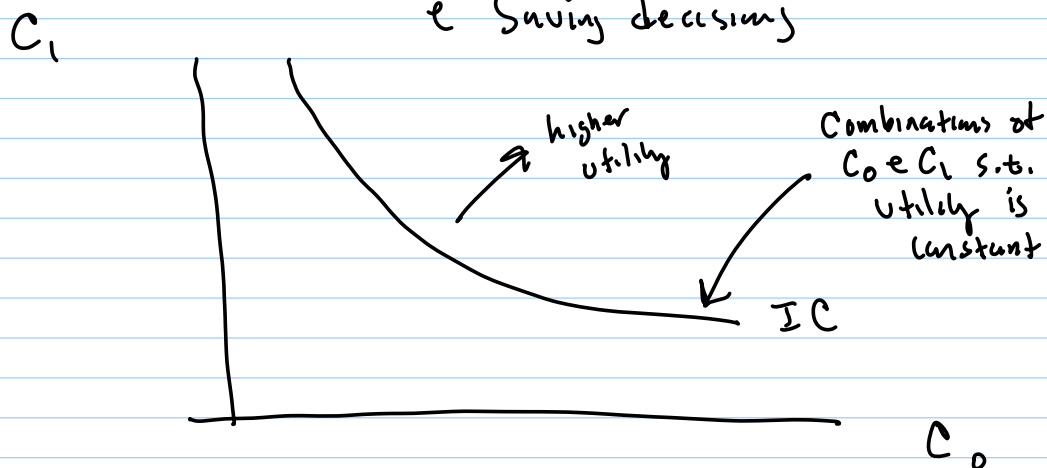


Fisher Model - Intertemporal Consumption & Saving decisions

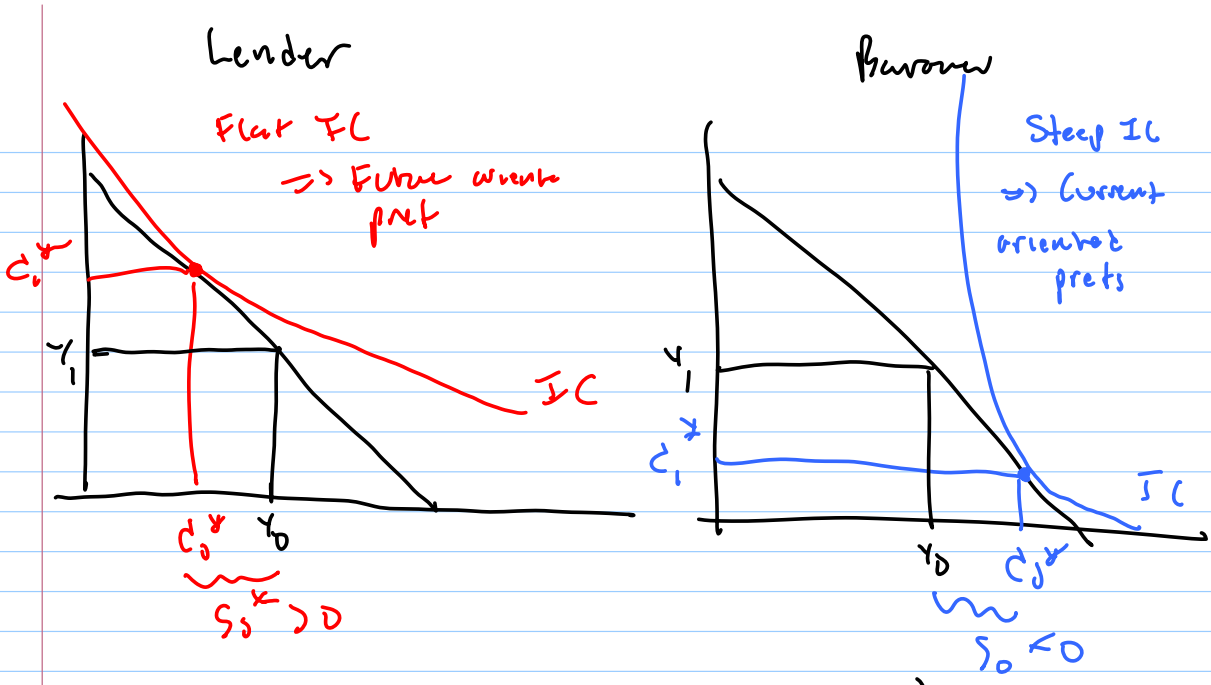
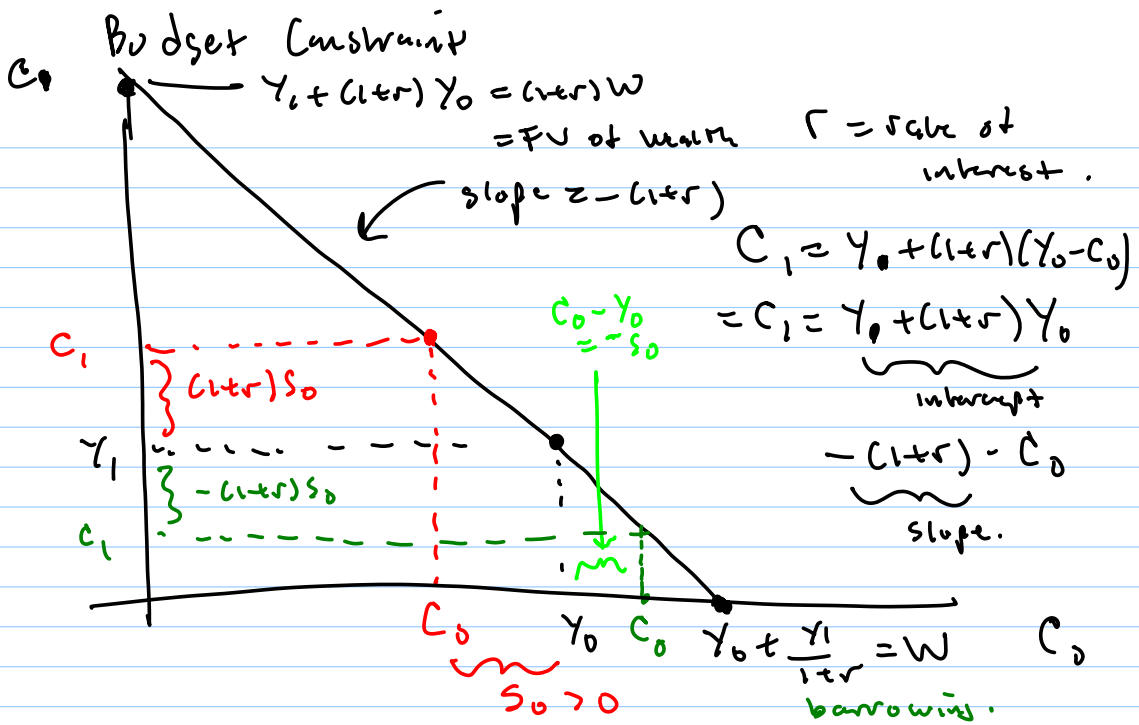


Q: What is the maximum amount that can be borrowed?

Borrow $\frac{Y_1}{1+r}$ = present value of future income

repay $\frac{Y_1}{1+r} \times (1+r) = Y_1$

$\frac{Y_1}{1+r}$ = present value of Y_1
= value today of getting Y_1
in period 1.



Example: Determine Equilibrium r

$$U(C_0, C_1) = C_0^{1/2} C_1^{1/2}, \quad MRS = -\frac{U_0}{U_1} = -\frac{C_1}{C_0}$$

$$C_0^* = \frac{1}{2}W = \frac{1}{2} \left[Y_0 + \frac{Y_1}{1+r} \right]$$

$$\begin{aligned} S_0^* &= Y_0 - C_0^* = Y_0 - \frac{1}{2} \left[Y_0 + \frac{Y_1}{1+r} \right] \\ &= \frac{1}{2} Y_0 - \frac{1}{2} \frac{Y_1}{1+r} \end{aligned}$$

Endowments: $A: (240, 160)$; $B: (320, 440)$
 $\quad \quad \quad Y_0^A \quad Y_1^A \quad \quad \quad Y_0^B \quad Y_1^B$

$$S^A(r) = \frac{1}{2}(240) - \frac{1}{2} \left(\frac{160}{1+r} \right) = 120 - \frac{80}{1+r}$$

$$S^B(r) = \frac{1}{2}(320) - \frac{1}{2} \left(\frac{440}{1+r} \right) = 160 - \frac{220}{1+r}$$

Equilibrium: $S^A(r) + S^B(r) = 0$

$$\Rightarrow 120 - \frac{80}{1+r} + 160 - \frac{220}{1+r} = 0$$

$$\Rightarrow 280 - \frac{300}{1+r} = 0$$

$$\Rightarrow (1+r) 280 = 300$$

$$\Rightarrow r = \frac{20}{280} = 0.0714$$