Eco 202

Smith

Additional Problems / Final

1

a) $W = 20,000$ (full insurance = damage)

$\pi = .05$

premium $= \pi W = .05 \times 20,000$

premium $= \$1000$

b)

$u_{\text{no insurance}} = .05 \ln(30,000) + .95 \ln(95,000)$

$= .52 + 10.28 = 10.79$

$u_{\text{ins}} = .05 \ln(48,500) + .95 \ln(48,500)$

$= 10.79$

Alex is indifferent between insurance and no insurance.

2

$EV = EU$ because Bob is Risk neutral.

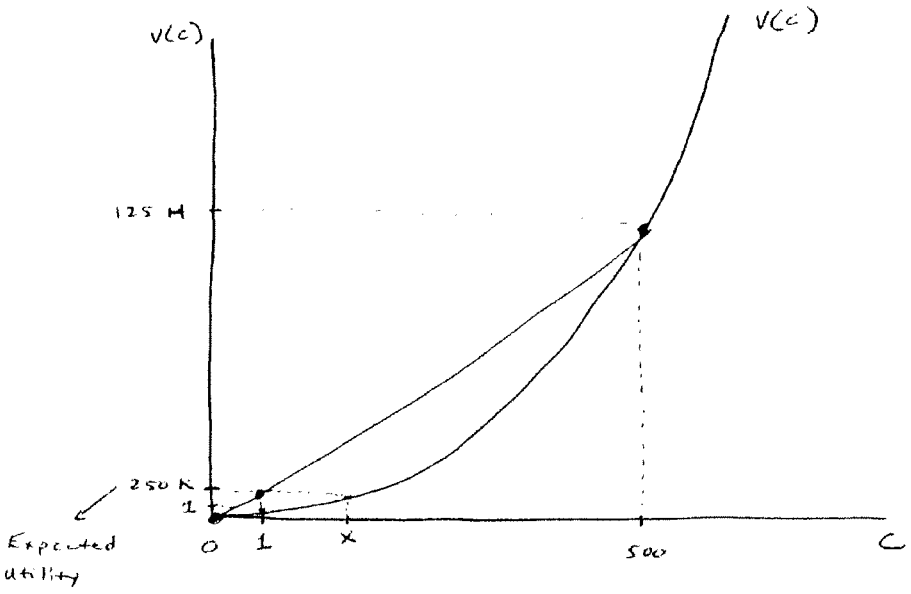
$$EV = \frac{1}{100,000,000} \cdot X + \frac{99,999,999}{100,000,000} \cdot \$0$$

If $EV \geq \$1$, then he should buy the ticket.

$X = 100,000,000$

Jackpot must be at least $\$100,000,000$.

3 a)



$$EV = \frac{499}{500} \cdot 0 + \frac{1}{500} \cdot 500$$

$$EV = 1$$

$$EU = \frac{499}{500} \cdot (0)^3 + \frac{1}{500} \cdot (500)^3 \Rightarrow \text{EU is not asked for in the problem.}$$

$$= 250,000$$

b)

$$(x)^3 = 250,000$$

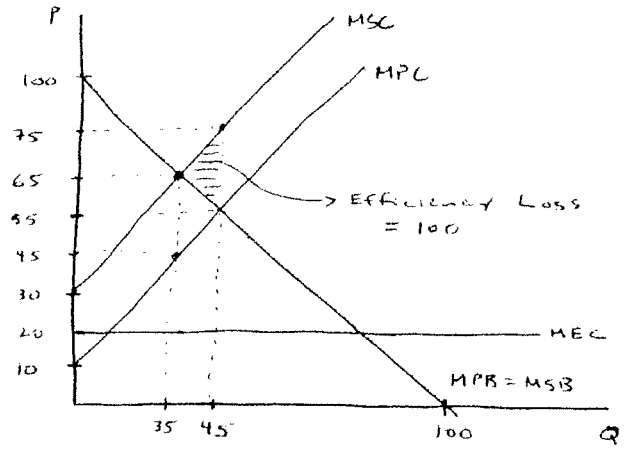
$$\boxed{x = 63.00} \Rightarrow \text{Really loves risk!}$$

Externalities

1

a) $MSC = MPC + MEC$

$MSC \Rightarrow P = 30 + Q$



b) $MPC = MPB$

$10 + Q = 100 - Q$

$2Q = 90$

$Q^* = 45$

$P^* = 55$

c) $MSC = MSB$

$30 + Q = 100 - Q$

$70 = 2Q$

$Q^* = 35$

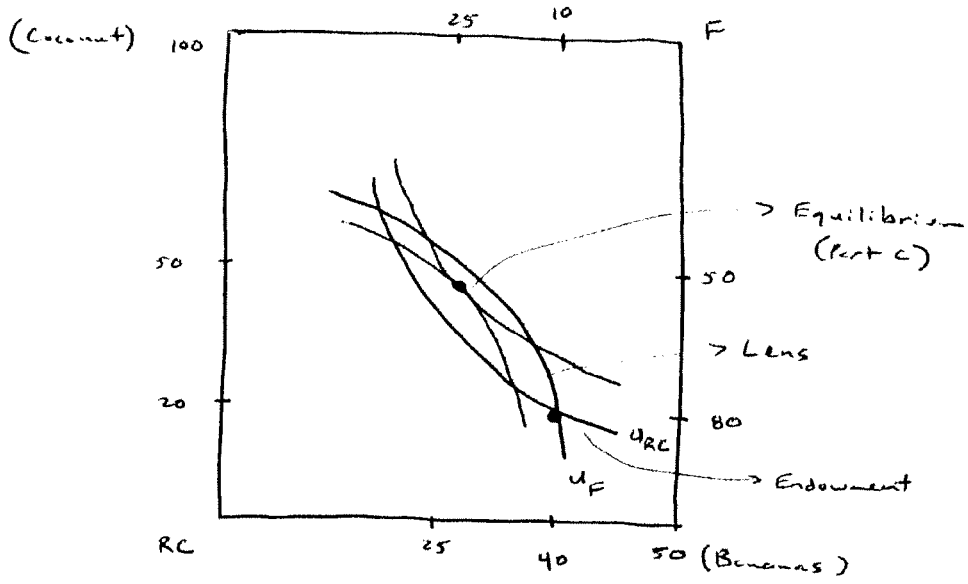
General Equilibrium

1

a) 50 B, 100 C } Totals

RC ⇒ 40 B 20 C

F ⇒ 10 B 80 C



b) $U_{RC} = B \cdot C$ $\qquad$ $U_F = B \cdot C$

$MRS_{RC} = \frac{MU_B}{MU_C} = \frac{C}{B}$ $\qquad$ $MRS_F = \frac{MU_B}{MU_C} = \frac{C}{B}$

$MRS_{RS} = \frac{20}{40} = 1/2$ $\qquad$ $MRS_F = \frac{80}{10} = 8$

c) $B_{RC} = \frac{1}{2} \cdot \frac{I}{P_B}$ $\qquad$ $B_F = \frac{1}{2} \cdot \frac{I}{P_B}$

$C_{RC} = \frac{1}{2} \cdot \frac{I}{P_C}$ $\qquad$ $C_F = \frac{1}{2} \cdot \frac{I}{P_C}$

$I_{RC} = 40 P_B + 20 P_C$ $\qquad$ $I_F = 10 P_B + 80 P_C$

For equilibrium $\Rightarrow$ Total Demand = Total Supply

Banana Market

Endowments

$$B_{RC} + B_F = \overline{B}_{RC} + \overline{B}_F$$

Demand = Supply

$$\frac{1}{2} \cdot \frac{(40 P_B + 20 P_C)}{P_B} + \frac{1}{2} \cdot \frac{(10 P_B + 80 P_C)}{P_B} = 40 + 10$$

$$40 + 20 \frac{P_C}{P_B} + 10 + 80 \frac{P_C}{P_B} = 100$$

$$100 \frac{P_C}{P_B} = 50$$

$$\frac{P_C}{P_B} = \frac{50}{100} \qquad \text{If } P_C = 1, \text{ then } P_B = 2$$

So

$$I_{RC} = 40(2) + 20(1) = 100$$

$$I_F = 10(2) + 80(1) = 100$$

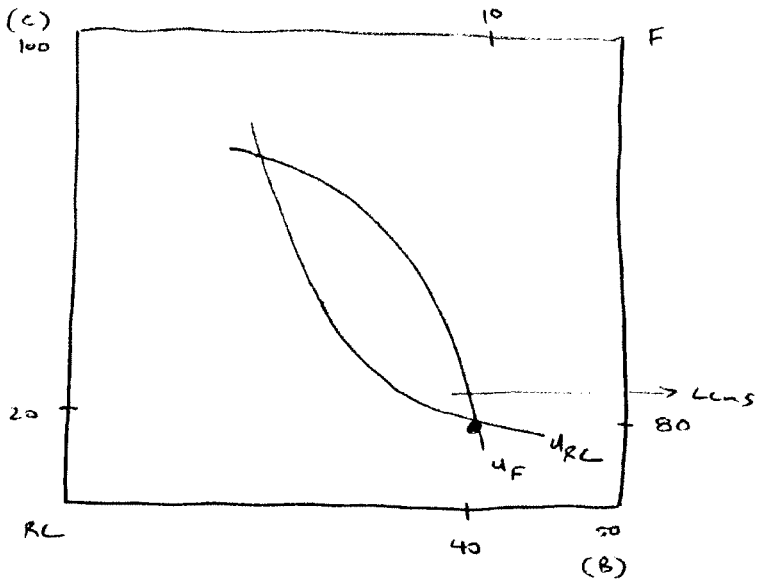
$$B_{RC} = \frac{1}{2} \cdot \frac{100}{2} = 25 \qquad B_F = \frac{1}{2} \cdot \frac{100}{2} = 25$$

$$C_F = \frac{1}{2} \cdot \frac{100}{1} = 50 \qquad B_F = \frac{1}{2} \cdot \frac{100}{1} = 50$$

2

a) no change in box size, endowment...

but indifference curves will be slightly different due to the change in exponents.



b) $u_{RC} = BC^2$ $\qquad$ $u_F = B^2C$

$$MRS_{RC} = \frac{MU_B}{MU_C} = \frac{C^2}{2BC} = \frac{C}{2B}$$

$$MRS_F = \frac{2BC}{B^2} = \frac{2C}{B}$$

At endowment:

$$MRS_{RC} = \frac{20}{2(40)} = \frac{1}{4} \qquad MRS_F = \frac{2(80)}{10} = 16$$

c)

$$B_{RC} = \frac{1}{3} \cdot \frac{I}{P_B} \qquad B_F = \frac{2}{3} \cdot \frac{I}{P_B}$$

$$C_{RC} = \frac{2}{3} \cdot \frac{I}{P_C} \qquad C_F = \frac{1}{3} \cdot \frac{I}{P_C}$$

Set:

Demand = Supply

$$B_{RC} + B_F = \bar{B}_{RC} + \bar{B}_F$$

$$\frac{1}{3} \cdot \frac{(40P_B + 20P_C)}{P_B} + \frac{2}{3} \cdot \frac{(10P_B + 80P_C)}{P_B} = 40 + 10$$

$$40 + \frac{20P_C}{P_B} + 2\left(10 + \frac{80P_C}{P_B}\right) = 150$$

$$60 + \frac{20P_C}{P_B} + \frac{160P_C}{P_B} = 150$$

$$180 \frac{P_C}{P_B} = 90$$

$$\frac{P_C}{P_B} = \frac{90}{180} \Rightarrow \text{if } P_C = 1, \; P_B = 2$$

So, $I_{RC} = 100$ $\qquad I_F = 100$

$$B_{RC} = \frac{1}{3} \cdot \frac{100}{2} = 16.67 \qquad B_F = \frac{2}{3} \cdot \frac{100}{2} = 33.33$$

$$C_{RC} = \frac{2}{3} \cdot \frac{100}{1} = 66.67 \qquad C_F = \frac{1}{3} \cdot \frac{100}{1} = 33.33$$