1. 4)

Smith chooses Careful:

$\bar{\pi}_S = 0.7\, U(12-x) + 0.3\, U(y-x)$

$\bar{\pi}_I = 0.7x + 0.3(x-y)$

Smith chooses Careless:

$\underline{\pi}_S = 0.4\, U(12-x) + 0.6\, U(y-x)$

$\underline{\pi}_I = 0.4x + 0.6(x-y)$

$x = 12 - \pi_S^{safe}$ $\quad y = \pi_S^{theft} + x = 12 + \pi_S^{theft} - \pi_S^{safe}$

$\bar{\pi}_S = 0.7\, U(\pi_S^{safe}) + 0.3\, U(\pi_S^{theft})$

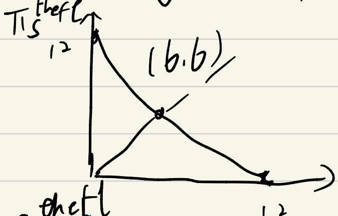
$\bar{\pi}_I = 8.4 - 0.3\,\pi_S^{theft} - 0.7\,\pi_S^{safe}$

$\underline{\pi}_S = 0.4\, U(\pi_S^{safe}) + 0.6\, U(\pi_S^{theft})$

$\underline{\pi}_I = 4.8 - 0.4\,\pi_S^{safe} - 0.6\,\pi_S^{theft}$

When Smith rejects, he choose Careful, states (12, 0)

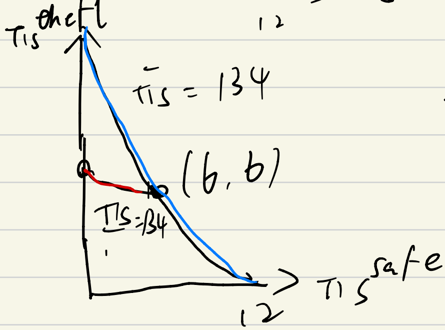
Utility: $0.7 \times 12 \times 16 = 134.4 \simeq 134$



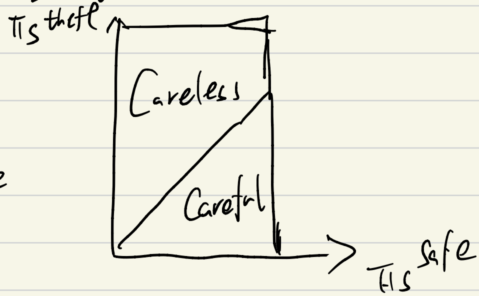
Along the 45 line, $\bar{\pi}_S = \underline{\pi}_S$

$x \cdot (28 - x) = 134.4$

$x \simeq 6.15 \approx 6$



Smith's Choice



(2) Safe :

$U(\pi_{safe}) = 0.8\,U(10) + 0.2\,U(6) = 170.4$

Unsafe :

$U(\pi_{unsafe}) = 0.4\,U(10) + 0.6\,U(6) = 151.2$

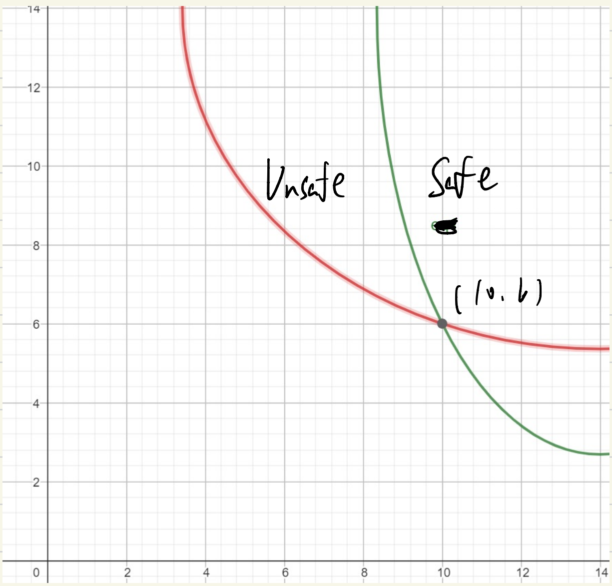
(x_{intact}, x_{broken})

Safe :

$0.8\,U(x_{intact}) + 0.2\,U(x_{broken}) = 170.4$

Unsafe :

$0.4\,U(x_{intact}) + 0.6\,U(x_{broken}) = 151.2$



2. Pooling Equilibrium

Payoff : $(2+4) \div 2 = 3$ Participation: $U_L(S=0) = 3 \geq 0$ $U_H(S=1) = 1 \geq 0$

$S(low) = S(High) = 0$ Incentive: $U_L(S=0) = 3 \geq U_L(S=1) = -1$

$w(0) = w(1) = 3$ $U_H(S=0) = 3 \geq U_H(S=1) = 1$

$Prob(a = Low \mid S=1) = 0.5$

Separating Equilibrium

$$\begin{cases} s(Low)=0, & s(High)=1 \\ w(0)=2, & w(1)=4 \end{cases}$$

Participation:

$U_L(s=0) = 2 \qquad U_H(s=1) = 4 - \frac{8\times 1}{4} = 2 \geq 0$

Incentive Compatibility:

$U_L(s=0) = 2 \geq U_L(s=1) = 4 - \frac{8\times 1}{2} = 0$

$U_H(s=1) = 2 \geq U_H(s=0) = 2$