Excluded Losses and the Demand for Insurance

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Small Losses

Independent Losses

Excluded Losses

Homeowner’s Insurance: damage due to flood

Life insurance: death due to suicide

Product warranty: damage caused by tampering

Crop insurance: “not following good agricultural practices"

Two properties

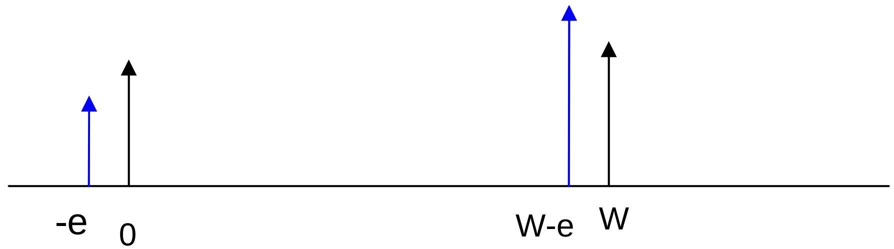
1. unreimbursed

2. When an excluded loss occurs,
   a covered loss does not occur, and vice versa

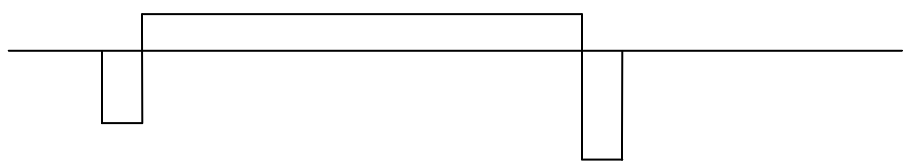
Let x_1 denoted a cover loss and x_2 an excluded loss

$$g(x_1, x_2) = \begin{cases} \alpha \cdot f_1(x) & \text{for } (x_1, x_2) = (x, 0) \text{ for all } x \text{ in } [0, b] \\ (1 - \alpha) \cdot f_2(x) & \text{for } (x_1, x_2) = (0, x) \text{ for all } x \text{ in } [0, b] \\ 0 & \text{for } (x_1, x_2) = \text{all other values in } [0, b] \ \text{X} \ [0, b] \end{cases}$$

$$g(x_1, x_2) = h_1(x_1) \cdot h_2(x_2)$$



G(W)- F(W)



$$W = W_0 + V - x_1 + \theta(I(x_1) - P)$$

$$Eu(W) = \int_0^b u(W_0 + V - x_1 + \theta(I(x_1) - P))f_1(x_1)dx_1$$

$$W = W_0 + V - x_1 - x_2 + \theta(I(x_1) - P)$$

$$Eu(W) = \iint_{0\le x_1\le b,\ x_2=0} u(W + V - x_1 - x_2 + \theta(I(x_1) - P))g(x_1, x_2)$$

$$+ \iint_{0\le x_2\le b,\ x_1=0} u(W + V - x_1 - x_2 + \theta(I(x_1) - P))g(x_1, x_2)$$

$$+ \iint_{0<x_1, 0<x_2} u(W + V - x_1 - x_2 + \theta(I(x_1) - P))g(x_1, x_2)$$

$$Eu(W) = \int_0^b u(W_0 + V - x_1 + \theta(I(x_1) - P))\alpha \cdot f_1(x_1)dx_1$$

$$+ \int_0^b u(W_0 + V - x_2 - \theta \cdot P)(1 - \alpha)f_2(x_2)dx_2$$

$$\frac{dEu(W)}{d\theta} = \int_0^b u'(W_0 + V - x_1 + \theta(I(x_1) - P))(I(x_1) - P)\alpha \cdot f_1(x_1)dx_1$$

$$+ \int_0^b u'(W_0 + V - x_2 - \theta \cdot P)(-P)(1 - \alpha)f_2(x_2)dx_2 = 0$$

Theorem 1: When excluded risks are present and full insurance is offered at an actuarially fair price, all risk averse decision makers choose less than full insurance.

Theorem 2: When excluded risks become larger, that is as α decreases, the decision maker chooses less insurance.