HS 239

Answer Key: Quiz 2, 2024

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1. The question deals with the model of tax evasion done in class. Assume that $p = 0.25$, $1 - p = 0.75$; $F = 2$, $t = 0.3, Y = 1000$; $U(Y) = \ln(Y)$. Here, p is the probability of detection. What is the amount of tax evaded?

Ans

Here,

$$\begin{aligned} Y_{nc} &= 1000 - 0.3 * X \\ Y_c &= (1-t)\,Y - Ft(Y - X) \\ &= .7 * 1000 - 2 * .3 * 1000 + 2 * .3 * X \\ &= 100 + .6X \end{aligned}$$

The agent's objective function is

$$\max_X \; .25 * \ln(100 + .6X) + .75 * \ln(1000 - .3X)$$

FOC is

$$\frac{.25 * .6}{100 + .6X} = \frac{.75 * .3}{1000 - .3X}$$

Solving which, we get $X = 708.33$

Thus, the amount of tax evaded $= t(Y - X) = .3 * (1000 - 708.33) = 87.50$

2. Write short note (any one)

a) Marshallian inefficiency of sharecropping

OR

b) Loss-aversion and tax evasion

Ans:

Straight from the lecture/notes/problem sets. While attempting Marshallian inefficiency, you need to show that if one replaces a sharecropping contract with an equivalent rental contract, it would lead to betterment for at least one party (either tenant, or landlord, or both).

3. MCQ.

a) In a model of sharecropping, higher disturbance in production will create higher share for tenant (True/false)

False, as the share does not depend on disturbance term $\left(\sigma^2\right)$.

b) The utility function $u = \sqrt{x}$ would exhibit precautionary savings. (True/ False)

True, as $u''' = \dfrac{3}{8x^{\frac{5}{2}}} > 0$. *Thus,* u' *is convex.*

c) The utility function , $u = \alpha x - \frac{\beta}{2}x^2$, $\alpha, \beta > 0$, would exhibit precautionary savings.(True/false)

False, as $u''' = 0$

d) In Friedman-Savage hypothesis, the middle class in a society should exhibit risk-loving behavior (True/false).

True. See the lecture note.

e) Higher tax rates would induce more tax compliance if the utility function is CARA/DARA/IARA. (Tick)

DARA

f) If the government guarantees a universal basic income, it is possible to elicit risk living behavior from an otherwise risk-averse agent. (True/false)

Yes, in the vicinity of the guaranteed income , there is a kink and the function is convex.

g) In a standard model of tax evasion, suppose $F = 2.5$ and p (audit probability) is $p = .25$. One must *evade/not-evade*

For evasion , $p(1+F) < 1$. Here, $p(1+F) = .25 * (1+2.5) = 0.875$ Therefore everybody will evade.

h) In a model of sharecropping, if the tenant becomes more risk averse, then she demands higher/lower share of output (Tick).

Lower share, as with increased share, the risk increases.

i) A gentleman has CARA utility function. His income is Y and evasion is E. The ratio E/Y, with increasing income, will (a) stays constant, (b) increase, (c) decrease. (Tick)

With CARA, $E = Y - X$ does not change as Y increases. Thus, $\frac{E}{Y} = 1 - \frac{X}{Y}$ will decrease as Y increases.

j) For a tax administrator, which policy is more easy to adopt? (a) increasing audit probability, (b) increasing fine rate, (c) creating more jails. (Tick)

Increasing fine rate.