

Assignment 1

1. All homeowners in an area own homes worth \$80,000 and an insurance company, Firelite, offers them protection against fire. Firelite offers two different policies: (i) *partial insurance*, whereby a homeowner pays \$5,900 in premium and in the event of a fire receives \$58,400 from Firelite; (ii) *full insurance*, whereby a homeowner pays \$11,600 in premium and in the event of a fire receives \$80,000 from Firelite.

The chance of a fire in a particular home is $0 \leq p \leq 0.4$ and is known to the homeowner *but not to Firelite*.

Peter and John are two home owners. Peter lives on the edge of a forest and, for him, $p=0.1$. John lives in a suburb and, for him, $p=0.03$. Both have the same utility function: $u(x) = \sqrt{10,000 + x}$ where x is the net wealth of the home owner in a particular contingency and under a particular policy: with partial insurance and no fire $x=80000-5900$ while with partial insurance and a fire $x=58400-5900$.

1. Of the three options available - no insurance, partial insurance, full insurance - what is the best option for Peter? For John?
2. For which values of p (the probability of house burning down) would home owners with that p choose:
 - (i) No insurance?
 - (ii) Partial insurance?
 - (iii) Full insurance?

2. An individual tax payer has income y which he should declare to the Inland Revenue (IR). Tax is payable at the proportionate rate t . The tax payer declares an income of x , $0 \leq x \leq y$. He is aware that some of the tax returns are audited by the IR. Assume that the probability that a tax return is audited is p . When the return is audited the IR becomes aware of the true taxable income (y). If $x < y$, the tax payer must pay the underpaid tax *and* a penalty of s times the underpaid tax.

(i) If the tax payer chooses $x < y$ show that under two "states" of the world – audited (A) or not audited (NA) – his disposable income is:

$$(a) C_{NA} = y - tx \quad (b) C_A = y[1-t-st] + stx$$

(ii) Assume that the individual chooses x so as to maximise expected utility: $EU = (1-p)u(C_{NA}) + pu(C_A)$ for a utility function $u(\cdot)$ which is increasing and concave.

(a) Write down the first order conditions for a maximum

(b) Show that if $(1 - p - ps) > 0$ the individual will definitely under report income.

Due Date: 3pm, Friday, 6 November 2009 in 3A02 (School of Economics Office)

Assignment 2

1. There are two types of workers in an economy: type a workers have productivity 2 and type b workers have productivity 1. Workers' productivities are unobservable by employers but workers can use their own resources to acquire education certificates to signal their "type". The cost of acquiring education is z for type b workers and $(1/2)z$ for type a workers.
 1. Find the least cost separating equilibrium.
 2. Suppose that the proportion of type b workers is π . For what values of π will a no-signalling equilibrium dominate any separating equilibrium?
 3. Suppose that $\pi=1/4$. What values of z are consistent with a pooling equilibrium?

2. An oligopoly consists of N identical firms. Show that if the firms act as Cournot competitors, the oligopoly price will approach the competitive price.

Due Date: 3pm, Friday, 4 December 2009 in 3A02 (School of Economics Office)