

Economics 336Y – Public Economics

Problem Set on Clarke-Groves Taxes

One hundred people live in a village that must decide whether to build a community centre or not. Residents either value the benefits they will receive from the centre at \$2000 (“demanders”) or they place no value on it at all (“non-demanders”). The centre would cost \$100,000 to build, to be divided equally among residents. Hence the after-tax value of the centre is

$$w_i = \begin{cases} 1000 & \text{for demanders} \\ -1000 & \text{for non-demanders} \end{cases}$$

Under the Clarke-Groves tax system, each resident reports their willingness to pay for the community centre to be either $r_i = 1000$ or $r_i = -1000$, and pays additional taxes that are a function of the sum of reports of the other people.

1. Write down the Clarke-Groves pivot tax formula that a typical resident i in this example. In particular, what must be true about the valuations of the other 99 residents for the pivot tax to be positive?
2. Britney is a demander, but Christina is not. Show that both Britney and Christina get their maximum utility by telling the truth.
3. Suppose that the number of demanders in the village is unknown, but it is believed that the probability that any individual villager is a demander is exactly one-half. Based on this belief, how likely is it that pivot taxes will be paid to the government, and how big will the government budget surplus be if so?