

Economics 5300.03 : Public Economics I
Midterm Exam : October 27 1997

time = 1 hour

Do all 3 questions. All count equally.

1. Consider a two-person economy, where labour is the only factor of production, and where people differ only in their productive ability, with type-2 people able to produce more output per hour than type-1 people.

Sketch the utility possibility frontier for the following 3 cases (all in the same diagram) :

i the “first-best” economy, in which lump-sum taxes and transfers are possible ;

ii an economy in which redistribution can only be achieved by a “flat” income tax (i.e. an income tax with a constant marginal rate) ;

iii an economy in which redistribution can be achieved only by an income tax, but in which there are no restrictions on the shape of the income tax schedule [except that both individuals must face the same schedule, and that the resulting allocation be feasible].

2. Suppose all consumers in the economy were identical, and all had the same expenditure function [indicating the minimum cost of attaining a given level of utility], namely

$$E(P_1, P_2, u) = 4\sqrt{P_1 P_2} u$$

where u is the level of utility, and P_1 and P_2 are the prices (including taxes) paid for two taxable goods, 1 and 2. Suppose the net-of-tax prices of each good are given : $p_1 = p_2 = 1$.

If t_1 and t_2 are the unit taxes on the two goods (so that $P_1 = 1 + t_1$, $P_2 = 1 + t_2$), could $t_1 = 0$, $t_2 = 1$ be an optimal commodity tax system? Explain your answer.

3. State the “golden rule of economic growth”, and explain briefly its relevance to the welfare analysis of public pension programmes.