

## Econ 4620 Public economics

### Problem 1

Suppose that a non-linear income tax and transfer policy is optimised in the special case where a Rawlsian welfare function is maximised. It has been shown (subject to certain qualifications) that the optimal tax schedule then satisfies the condition:

$$(1) \frac{T'(z)}{1-T'(z)} = \frac{1-G(z)}{\varepsilon_s(z)g(z)}$$

where

$z$  denotes gross income,

$T(z)$  is the income tax function,

$T'(z)$  is the marginal income tax,

$\varepsilon_s(z)$  is the (compensated) wage elasticity of labour supply (measured by  $z$ ),

$G(z)$  is the cumulative income distribution function,

and  $g(z)$  is the corresponding density function.

Present your economic interpretation of (1).

(You are not supposed to derive the condition in your answer.)

### Problem 2

Suppose that income taxation is designed in accordance with the Mirrlees tax model and is supplemented by optimal commodity taxes. There are  $m$  commodities. Assume that there are two types of agents; a low-skilled type, labelled 1, and a high-skilled type, labelled 2.

Normalise the number of each type to unity. Denote by  $x_k^j$  the amount of commodity  $k$  consumed by type  $j$  ( $j=1,2$ ), and denote by  $S_{ik}$  the aggregate, compensated derivative of commodity  $i$  with respect to the price of commodity  $k$ , i.e.  $S_{ik} = \partial x_i / \partial Q_k$  where  $x_i$  is aggregate, compensated demand, and  $Q_k$  is the consumer price of good  $k$ . Let  $t_i$  denote the (specific) tax on commodity  $i$ . Finally, let  $\hat{x}_k^2$  be the demand of the high-skilled type for commodity  $k$  if they were to mimic the low-skilled type.

Conditions characterising the optimal tax structure are then given by the formula

$$(2) \sum_{i=1}^m t_i S_{ik} = \lambda^* (x_k^1 - \hat{x}_k^2) \quad \text{for } k=1, 2, \dots, m,$$

where  $\lambda^*$  is a positive parameter.

a) Explain the economic content of (2) with emphasis on social efficiency trade-offs.

If you find it hard to interpret (2), you may still try to explain the role for a commodity tax alongside a non-linear income tax.

b) What kind of goods would be suitable for being taxed at a strictly positive rate according to (2)?

c) What may be major difficulties with implementing a commodity tax structure based on (2)?

d) Can you think of other reasons for levying commodity taxes than those captured by (2)?

Briefly explain each argument for a tax.

### Problem 3

Discuss implications for tax policy of cross-border mobility.