

**UNIVERSITY OF OSLO**  
**DEPARTMENT OF ECONOMICS**

Exam: **ECON4620 – Public Economics, spring 2012**

Date of exam: Friday, May 25, 2012

**Grades are given: June 12, 2012**

Time for exam: 09:00 a.m. – 12:00 noon

The problem set covers 2 pages

Resources allowed:

- No resources allowed

The grades given: A-F, with A as the best and E as the weakest passing grade. F is fail.

**Problem 1 (weight 50%)**

Discuss the statements in a) and b) below.

- “Since an income tax distorts labour supply, more of the taxes being raised should be shifted from income to commodities.” Assume there is no externality in this context.
- “By introducing a tax on an externality-generating commodity one can reduce the external effect and raise revenue that allows cutting distortionary income taxes. As a result one can reap a double dividend.”

**Problem 2 (weight 25%)**

Consider a small open economy (the home country) producing a homogeneous good by means of labour,  $L$ , and capital,  $K$ , where the macro production function  $F(K, L)$  exhibits constant returns to scale and has standard properties. There is a fixed amount of labour, which is immobile. Capital is perfectly mobile across borders. From the perspective of the home country there is a fixed net rate of return to capital in the world market, denoted by  $\rho$ . Denote by  $\bar{K}$  the fixed endowment of domestically owned capital. Let  $k = K / L$ ,  $\bar{k} = \bar{K} / L$ , and let  $f(k)$  denote output per capita. Suppose that the home country considers introducing a (source-based) tax on capital used in the home country. Denote the tax rate by  $t$ .

- How would the tax affect the inflow or outflow of capital?
- Who would bear the tax burden?
- Suppose the country would like to maximise  $f(k) + \rho(\bar{k} - k)$ .

Explain why this may be a reasonable objective function.

- What would then be the optimal tax rate  $t$ ?

State the reason for your answer in each case.

**Problem 3 (weight 25%)**

Consider a shareholder acquiring a share of stock at time 0 and selling it at time  $s$ .

$A_0$  is the acquisition price of the share at time zero

$M_s$  is the share price at time  $s$

$D_t$  is the dividend paid to the shareholder at time  $t$

$i$  is the after-tax market rate of interest

Assume that  $D_t \geq iA_0$  for all  $t$ .

The shareholder pays a tax

$$\tau \left[ \frac{M_s - A_0}{(1+i)^s} + \sum_{t=1}^s \frac{D_t - iA_0}{(1+i)^t} \right] \quad (1)$$

where  $\tau$  is the tax rate and the expression in brackets is the tax base.

- a) Explain how formula (1) expresses the tax liability of a shareholder who is taxed according to the Norwegian shareholder income tax model.

It can be shown that

$$\frac{M_s - A_0}{(1+i)^s} + \sum_{t=1}^s \frac{D_t - iA_0}{(1+i)^t} = \frac{M_s}{(1+i)^s} + \sum_{t=1}^s \frac{D_t}{(1+i)^t} - A_0 \quad (2)$$

- b) What does equation (2) tell us about the shareholder income tax?
- c) Give conceivable reasons for having a shareholder income tax.