Exam ECON3620/4620: Public Economics – Taxation, 2nd exam 2025

1. True/false questions (20% weight)

You need to explain your answer, just a true false or "it depends" statement without any arguments is not rewarded.

(a) The altruistic inheritance model suggests that inheritance taxation leads to an efficiency loss.

(b) When taxation of a commodity is changed, the consumers (and not the suppliers) bear the burden of the tax change when the consumer demand is inelastic.

(c) A lump sum tax is distortionary.

(d) The Gini coefficient builds on the Lorenz-curve.

2. Elasticities and deadweight loss (40% weight)

Suppose a consumer has utility given by:

$$u(x,y) = a\ln(x) + y$$

and faces the budget constraint:

$$p_x x + p_y y = M$$

(a) Derive the Marshallian demand functions for x and y.

(b) Does good x have an income effect? Explain.

(c) Derive the price elasticity of demand for x. Is this the uncompensated (Marshallian) or compensated (Hicksian) elasticity?

(d) Suppose the price elasticity of supply for good x is 0.5. How will a unit tax of size t on good x be split between demand and supply?

(e) Derive the expenditure function and calculate the compensating variation for a tax increase from p_x to $p_x + t$.

(f) Derive the tax revenue generated from the tax.

(g) Derive the deadweight loss (efficiency loss) from the tax.

(h) Why does the deadweight loss increase in a?

3. On the ETI (40% weight)

(a) The change in taxable labor income for individual i between income at time t, z_{it}, and income at time $t+3$, z_{t+3}, can be explained by the change in the net-of-tax rate, $1-\tau_i$ over the same period, seen as

$$\log \frac{z_{it+3}}{z_{it}} = \alpha_t + e \log \frac{1-\tau_{it+3}}{1-\tau_{it}} + \varepsilon_i$$

where α_t is a time-specific effect and ε_i is the error term.

The key parameter, e in the equation measures the elasticity of taxable income (ETI). Explain why most authors use an instrument for the change in the net-of-tax rate in the identification of e and why some representation of income in period t is entered as an additional variable in the equation because of the instrument that is commonly used in the literature.

(b) Say that the marginal tax rate is the top rate of the scheme for taxation of earnings. The following formula places the elasticity of taxable, e, into an expression for the optimal tax, τ^*:

$$\tau^* = \frac{1-g}{1-g+ae}$$

Describe how the optimal top marginal tax rate varies with g, a, and e. Does it reflect the top of the Laffer-curve for $g = 0$?

(c) An alternative empirical strategy to obtain information about how taxpayers respond to tax changes is defined by estimating a structural labor supply model and then use the estimated model to simulate effects of tax change. Explain briefly how the analyst may go forward to estimate a structural labor supply model how it can be used to simulate effects of changes in the tax system.

(d) Discuss the advantages and disadvantages of the two approaches—the quasi-experimental ETI approach and the structural labor supply model—for analyzing how taxes affect labor earnings.