

Written Exam for the B.Sc. or M.Sc. in Economics summer 2014

Public Finance

Final exam

June 25, 2014

(3-hour closed book exam)

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by “eksamen på dansk” in brackets, you must write your exam paper in Danish.

If you are in doubt about which title you registered for, please see the print of your exam registration from the students’ self-service system.

This exam consists of 3 pages in total (excluding this front page)

You are supposed to answer ALL questions. The assignments (1A)–(3E) all carry the same weight in the assessment.

Part 1: Questions on various topics

Provide a thorough answer to each of the following questions:

(1A) Are tax pressure and excess burden of taxation the same concepts?

(1B) What is the difference between a horizontal externality and a vertical externality in the theory of fiscal federalism?

(1C) Can country-specific regulation policies internalize a global externality (e.g. Greenhouse gas emissions) when global regulation policies do not exist?

Part 2: Tax incidence and tax distortion

Consider a perfectly competitive market for a certain consumption good. The price per unit of the good received by the seller is $p_s = p_b - t$, where p_b is the price per unit of the good paid by the customers, and t is a tax paid by the seller to the tax agency.

(2A) Describe what is meant by the formal/legal incidence of a tax and what is meant by the economic incidence of a tax. Is it the seller or the buyer who has the formal tax incidence in this case?

Consider an increase in the tax rate t . Let MEB denote the marginal excess burden of the tax change, and let I_b and I_s denote the share born by buyers and sellers, respectively, of the extra total tax burden of buyers and sellers. It is possible to derive the following approximations for MEB, I_b and I_s :

$$\text{MEB} \approx \frac{t}{p} \frac{\varepsilon_s \varepsilon_b}{\varepsilon_s + \varepsilon_b}, \quad I_b \approx \frac{\varepsilon_s}{\varepsilon_s + \varepsilon_b}, \quad I_s \approx \frac{\varepsilon_b}{\varepsilon_s + \varepsilon_b},$$

where ε_s is the elasticity of supply with respect to the price p_s , ε_b is the (numerical) elasticity of demand with respect to the price p_b , and p denotes the equilibrium price without a tax.

(2B) Describe the economic intuition behind the above formulas and illustrate the impact of the tax change on tax incidence and tax distortion in a supply-demand-diagram.

(2C) Describe the impact on economic incidence and tax distortion in the special case where the supply of the good is perfectly elastic and in the special case where the demand of the good is perfectly inelastic.

Part 3: The elasticity of taxable income

Consider an individual with preferences represented by the utility function

$$u = c - \frac{\gamma a}{1 + \gamma} \left(\frac{z}{a} \right)^{\frac{1+\gamma}{\gamma}},$$

where c is consumption, z is taxable income, a is the productivity/ability of the individual, and γ is a positive parameter. The consumption level of the individual is given by

$$c = z - T(z),$$

where $T(z)$ is the tax payment.

(3A) Show that the optimal choice of taxable income of the individual is characterized by

$$z^* = a(1 - m)^\gamma, \quad (1)$$

where $m = T'(z^*)$ is the marginal tax rate.

(3B) Provide a definition of the elasticity of taxable income (ETI) and show that the ETI for the individual equals γ .

Consider now two groups of individuals H and L. The γ parameter is identical for the two groups but they have different ability levels. Group H has the highest ability level a^H while group L has a lower ability level a^L . The income levels of the two groups are observed both before and after a tax reform. The marginal tax rate of group H is m_1^H before the reform and m_2^H after the reform, and the income levels are z_1^H before the reform and z_2^H after the reform. The corresponding marginal tax rates and income levels of group L are denoted by m_1^L , m_2^L , z_1^L and z_2^L . In this case, the ETI may be computed as

$$\frac{[\ln(z_2^H) - \ln(z_1^H)] - [\ln(z_2^L) - \ln(z_1^L)]}{[\ln(1 - m_2^H) - \ln(1 - m_1^H)] - [\ln(1 - m_2^L) - \ln(1 - m_1^L)]}, \quad (2)$$

which is used by Martin Feldstein to estimate the ETI in his article "The effect of marginal tax rates on taxable income: A panel study of the 1986 tax

reform act.", published in the Journal of Political Economy (1995). Below is a copy of Table 2 from the article.

(3C) Use the optimum condition (1) to prove that the expression (2) is equal to the ETI.

(3D) Describe the main results of Feldstein (1995) and describe how the results are obtained by using the copy below of Table 2 from his article.

(3E) Discuss the assumptions underlying the empirical estimates of the ETI by Feldstein (1995) and potential reasons why the estimates may be biased.

ESTIMATED ELASTICITIES OF TAXABLE INCOME WITH RESPECT TO NET-OF-TAX RATES			
Taxpayer Groups Classified by 1985 Marginal Rate	Net of Tax Rate (1)	Adjusted Taxable Income (2)	Adjusted Taxable Income Plus Gross Loss (3)
Percentage Changes, 1985–88			
1. Medium (22–38)	12.2	6.2	6.4
2. High (42–45)	25.6	21.0	20.3
3. Highest (49–50)	42.2	71.6	44.8
Differences of Differences			
4. High minus medium	13.4	14.8	13.9
5. Highest minus high	16.6	50.6	24.5
6. Highest minus medium	30.0	65.4	38.4
Implied Elasticity Estimates			
7. High minus medium		1.10	1.04
8. Highest minus high		3.05	1.48
9. Highest minus medium		2.14	1.25

Copy of Table 2 in Feldstein, M. (1995). "The effect of marginal tax rates on taxable income: A panel study of the 1986 tax reform act." Journal of Political Economy.