

Written Exam at the Department of Economics Summer 2017

Public Finance

Final Exam

June 2, 2017

(3-hour closed book exam)

Please note that the language used in your exam paper must correspond to the language for which you registered during exam registration.

This exam question consists of 4 pages in total (excluding this front page)

NB: If you fall ill during the actual examination at Peter Bangsvej, you must contact an invigilator in order to be registered as having fallen ill. Then you submit a blank exam paper and leave the examination. When you arrive home, you must contact your GP and submit a medical report to the Faculty of Social Sciences no later than seven (7) days from the date of the exam.

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

Answer "True" or "False" to each of the questions below, and provide an explanation for your answer.

(1A) When a municipality raises its tax on labor income, it has a negative externality on the central government, when the central government also taxes the same labor income.

(1B) All else equal, a higher labor supply elasticity implies in a linear tax system that the revenue maximizing tax rate is higher.

(1C) In the paper “The Incidence of Mandated Maternity Benefits” by Jonathan Gruber (published in The American Economic Review in 1994), the empirical results support that employers are able to shift some of the costs of mandated benefits to the employees.

Part 2: Excess burden and taxes on labor income

Consider an economy where the government taxes labor income with a constant tax rate t . Individuals get utility from consumption c and disutility from supplying labor l captured by the utility function $u(c, l)$. The individuals' budget constraints are given by $c = (1 - t)l$, where the pre-tax wage rate is assumed to be fixed and normalized to 1.

(2A) Illustrate in a diagram with l on the primary axis and c on the secondary axis the initial optimum of an individual. How does the optimum change if the tax rate is increased from t to $t + dt$? Comment on the directions of the income and substitution effects, respectively.

(2B) How does the answer to (2A) change if the increase in the marginal tax rate only applies to income above a given threshold K . What can be said about the size of the income and substitution effects in this case relative to the general tax increase in question (2A)?

Assume that the optimization of all individuals in the economy generate an upwards sloping aggregate labor supply curve.

(2C) Illustrate the equilibrium in the labor market with a given tax rate t in a diagram

with labor supply/demand l on the primary axis and the wage rate (w) on the secondary axis. Show that the excess burden (deadweight loss) can be approximated by:

$$EB \approx \frac{1}{2} \varepsilon \cdot t^2 \cdot l_0, \quad \text{where } \varepsilon = \frac{dl/l}{dw/w} = -\frac{dl/l_0}{t/1} \quad (1)$$

is the labor supply elasticity measured from the no-tax equilibrium where $l = l_0$ (recall that with $t = 0$ the after-tax wage rate (w) is equal to the pre-tax wage rate normalised to 1, which means that $dw = -t$).

(2D) Assume that ε is constant and derive the marginal excess burden (MEB) of a small tax increase. How do ε and t affect the size of MEB and what is the intuition behind these effects?

(2E) Explain why we should only include behavioural responses due to the substitution effect when computing the excess burden? That is: why should we use the compensated elasticity in (1) and not the uncompensated? Illustrate how the diagram from the answer to (2C) would change if you had drawn the compensated labor supply curve instead of the uncompensated.

Part 3: Extensive labor supply responses

Consider a model where individuals have to decide whether to enter the labor market or not. If they enter the labor market they work a fixed number of hours (\bar{h}) at a fixed wage rate (w). Working thereby gives them fixed earnings of $Y = w\bar{h}$, however at the same time the individual has to pay a tax T . Working is furthermore associated with a fixed disutility cost q . Individuals who do not work receive benefits B . Utility is defined as:

$$u = \begin{cases} Y - T - q & \text{if working} \\ B & \text{if not working} \end{cases} \quad (2)$$

The fixed cost, q , is distributed heterogeneously across individuals according to a density function $f(q)$ with cumulative distribution function $F(q)$.

(3A) Derive the fixed cost of the marginal individual just willing to work, call it \bar{q} . Draw a diagram with q along the primary axis and $f(q)$ along the secondary axis. Illustrate the employment rate (E) in this diagram.

The government net revenue is given by $R = E \cdot T - (1 - E) \cdot B$.

(3B) Show that the effect of change in T on the government net revenue can be written as:

$$\frac{dR}{dT} = E \left[1 - \theta \frac{a + b}{1 - a - b} \right], \quad (3)$$

where $a = T/Y$, $b = B/Y$ and θ is the elasticity of the employment rate wrt. $Y - T - B$. Give an interpretation of equation (3).

In the paper “Labor Supply Response to the Earned Income Tax Credit” by Eissa and Liebman (published in the Quarterly Journal of Economics in 1996), the authors investigate the effect of the 1986 expansion of the earned income tax credit (EITC) for single women with children on their labor force participation. The EITC (in Danish: “beskæftigelsesfradrag”) offers a tax credit for eligible individuals contingent on earning positive income and having a qualifying child. Below is a copy of Figure IV from the article, showing the structure of the EITC pre and post reform.

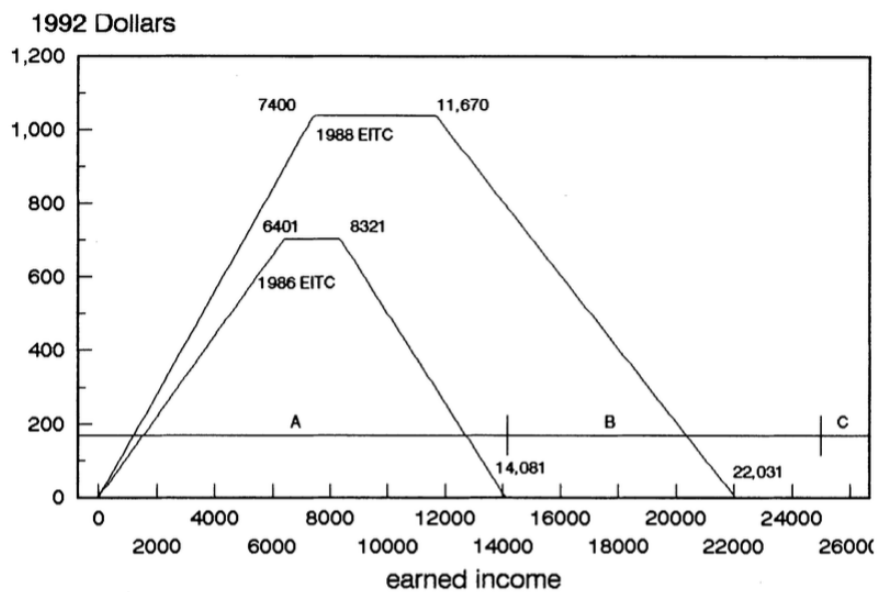


FIGURE IV
1986 and 1988 Earned Income Tax Credit

(3C) Explain how an EITC may affect labor force participation in the context of the

model presented above. How do you expect the reform to affect labor force participation of the targeted group?

Eissa and Liebman (1996) use the reform to estimate the impact of the EITC expansion on labor force participation of single women with children. Below is a copy of Table II from the article showing their main estimate.

TABLE II
LABOR FORCE PARTICIPATION RATES OF UNMARRIED WOMEN

	Pre-TRA86 (1)	Post-TRA86 (2)	Difference (3)	Difference-in- differences (4)
<i>A. Treatment group:</i>				
With children [20,810]	0.729 (0.004)	0.753 (0.004)	0.024 (0.006)	
<i>Control group:</i>				
Without children [46,287]	0.952 (0.001)	0.952 (0.001)	0.000 (0.002)	0.024 (0.006)

(3D) Describe the empirical analysis and explain, using Table II above, how the authors arrive at their estimate. Does their estimate have the expected sign, given your argumentation in (3C)? What is the main identifying assumption needed for the estimate to be the causal effect of the EITC on the labor supply of single women with children?

(3E) Describe how you could validate the main identifying assumptions needed in (3D) and what kind of data you would need to do so.