Written Exam for the M.Sc. in Economics winter 2015-16

Tax Policy

Final Exam

19 January 2016

(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.

This exam question consists of 6 pages (including this front page)

Exam - Tax Policy - Fall 2015

Read carefully before you start:

The exam consists of three parts each with a number of subquestions. You are supposed to answer ALL questions and subquestions. Good luck!

Part 1: Tax incidence

(1A) Consider a market for a commodity with a unit tax t paid by the consumers. The price received by the producers is denoted by p and the after-tax price paid by consumers is denoted by q where $q = p + t$.

Q: Show that under standard neoclassical assumptions the effect of a small tax increase on prices when starting from a zero tax is given by:

$$\frac{dq}{dt} = \frac{\varepsilon_{S,p}}{\varepsilon_{S,p} - \varepsilon_{D,q}}$$

$$\frac{dp}{dt} = \frac{\varepsilon_{D,q}}{\varepsilon_{S,p} - \varepsilon_{D,q}}$$

where $\varepsilon_{S,p}$ is the elasticity of supply with respect to p and $\varepsilon_{D,q}$ is the elasticity of demand with respect to q. **Q**: What do these results say about the economic incidence of the tax? **Q**: Show graphically that the economic incidence does not depend on the formal incidence (i.e. who actually pays the tax).

(1B) Doyle and Samphantharak (2008) study tax incidence on the market for gasoline. **Q**: Explain the empirical strategy of the paper as well as the main findings with reference to the figure in Annex A.

(1C) Chetty Loney and Croft (2009) show that if a tax is not fully salient to the consumers, the incidence on producer prices is given by:

$$\frac{dp}{dt} = \frac{\theta \varepsilon_{D,q|p}}{\varepsilon_{S,p} - \varepsilon_{D,q|p}}$$

where θ is the salience parameter, $\theta = (\varepsilon_{D,q|t}/\varepsilon_{D,q|p})$; $\varepsilon_{D,q|p}$ is the elasticity of demand with respect to the consumer price q where the change in q comes from a change in p; and $\varepsilon_{D,q|t}$ is the elasticity of demand with respect to the consumer price q where the change in q comes from a change in t.

Q: Derive this result and explain the intuition with reference to the figure in Annex B. [hint: use that under less than full tax salience, demand does not only depend on q, but on p and t separately, i.e. $D(p,t)$] **Q**: How would the formula look like if the tax was paid by the producers instead of the consumers?

Part 2: Economic efficiency

(2A) **Q:** Explain why a kink in the tax schedule may create an excess mass of tax payers ("bunching") at the kink and illustrate with a figure.

(2B) **Q:** Explain with your own words how the amount of bunching at the kink points in the tax schedule can be used to make inference about the elasticity of taxable income. **Q:** Why is the latter parameter important for optimal income taxation?

(2C) Saez (2010) estimates the elasticity of taxable income by exploiting the kinks in the U.S. tax schedule created by the Earned Income Tax Credit. **Q:** Discuss the results with reference to the figure and the table in Annex C. **Q:** Discuss the policy implications while relating to a theory framework with labor supply responses on the intensive and extensive margins as in Saez (2002).
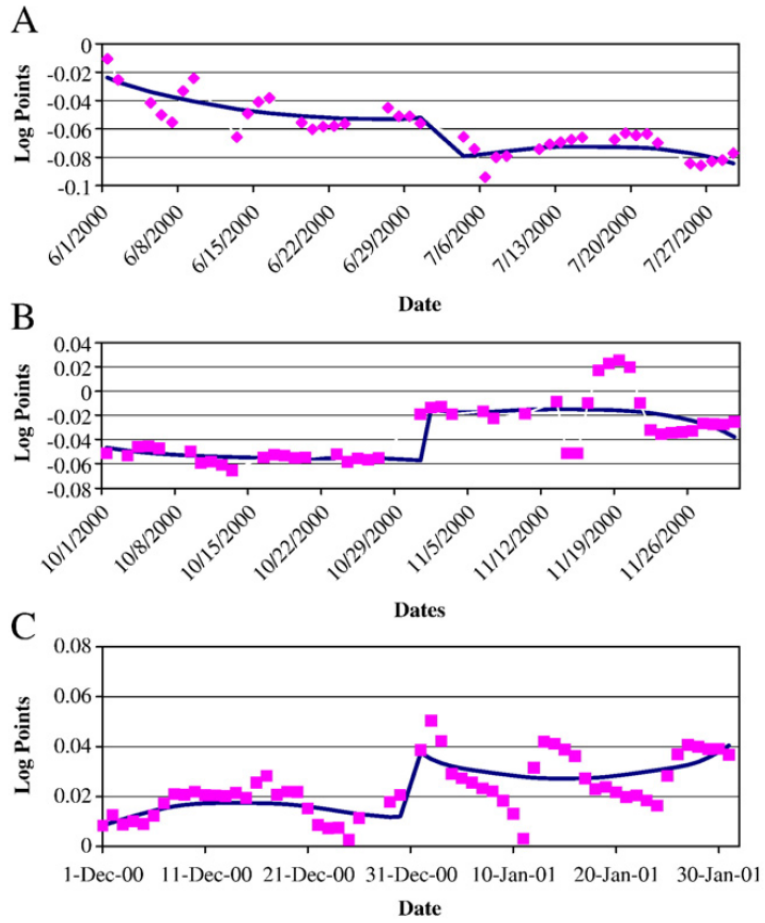
Part 3: Shorter questions

(3A) **Q:** Explain which parameters shape the optimal top marginal tax rate, i.e. the constant marginal rate applying to incomes above a threshold z^*. **Q:** Under which condition does the optimal top marginal tax rate equal 100%?
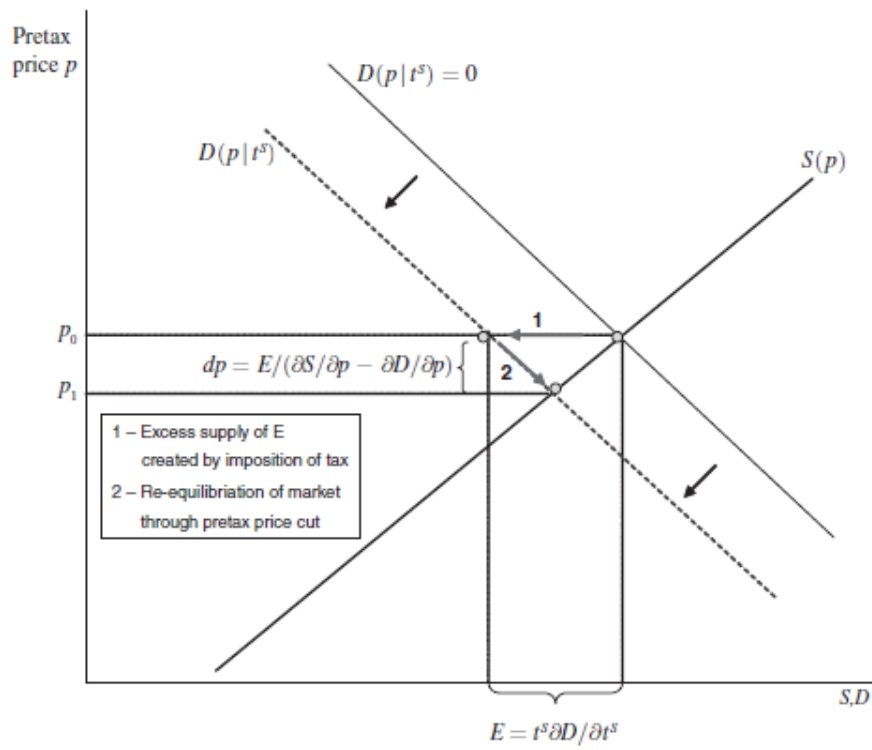
(3B) **Q:** How does the concern for equity shape optimal taxation of commodities in the many-person Ramsey model? **Q:** Does it matter for the design of optimal comodity taxes if the government has access to a non-linear income tax?

(3C) **Q:** Explain how dividend taxes and corporate income taxes affect dividend payments under the new view of firm taxation? **Q:** Explain how they affect firm value?

Annex A

Annex B

Pretax price p

$D(p\,|\,t^s) = 0$

$D(p\,|\,t^s)$

$S(p)$

P_0

$dp = E/(\partial S/\partial p - \partial D/\partial p)$

1

2

P_1

1 – Excess supply of E
created by imposition of tax

2 – Re-equilibriation of market
through pretax price cut

S,D

$E = t^s \partial D/\partial t^s$
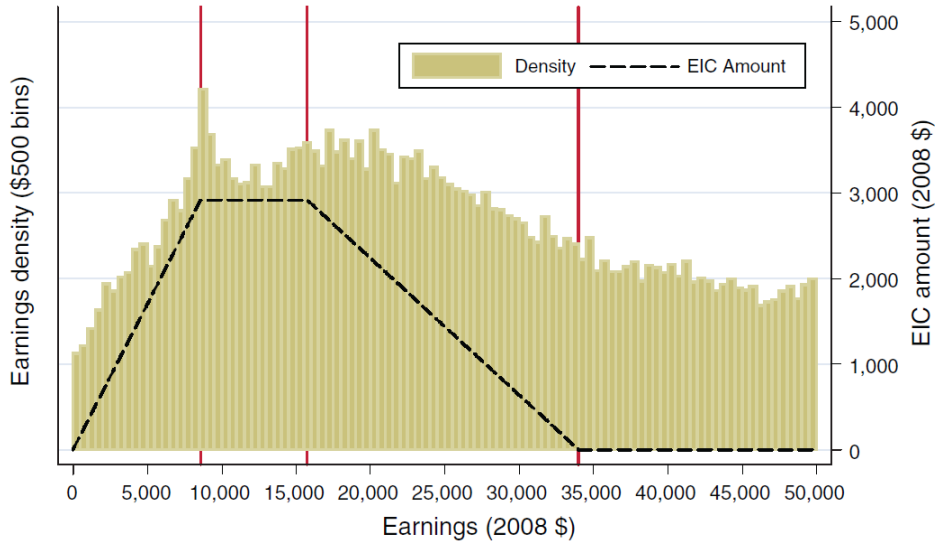
Annex C

Panel A. One child

TABLE 2—EARNINGS ELASTICITY ESTIMATES USING EITC BUNCHING EVIDENCE

Years	Kink	Bandwidth δ	All filers (self-employed and wage earners)		Self-employed only		Wage earners only	
			1 child	2+ children	1 child	2+ children	1 child	2+ children
			(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Estimates around EITC kinks (1995–2004)								
1995–2004	First kink	$1,500	0.213	0.152	1.101	0.755	0.025	0.003
Delta method standard errors			(0.033)	(0.020)	(0.092)	(0.054)	(0.036)	(0.022)
Bootstrap standard errors			(0.037)	(0.024)	(0.107)	(0.057)	(0.039)	(0.022)
1995–2004	Second kink	$1,000	−0.004	−0.007	−0.018	0.016	−0.001	−0.012
	(end of plateau)		(0.021)	(0.015)	(0.040)	(0.027)	(0.025)	(0.019)
1995–2004	Third kink	$1,500	−0.019	0.003	−0.032	−0.007	−0.017	0.006
	(end of EITC)		(0.011)	(0.006)	(0.021)	(0.010)	(0.013)	(0.008)