Written Exam at the Department of Economics winter 2020-21

Tax Policy

Final Exam

17 December 2020

(3½-hour open book exam)

Answers only in English.

The paper must be uploaded as <u>one PDF document</u>. The PDF document must be named with exam number only (e.g. '127.pdf') and uploaded to Digital Exam.

This exam question consists of 3 pages in total

This exam has been changed from a written Peter Bangsvej exam to a take-home exam with helping aids. Please read the following text carefully in order to avoid exam cheating.

Be careful not to cheat at exams!
You cheat at an exam, if you during the exam:

- Copy other people's texts without making use of quotation marks and source referencing, so that it may appear to be your own text. This also applies to text from old grading instructions.
- Make your exam answers available for other students to use during the exam
- Communicate with or otherwise receive help from other people
- Use the ideas or thoughts of others without making use of source referencing, so it may appear to be your own idea or your thoughts
- Use parts of a paper/exam answer that you have submitted before and received a passed grade for without making use of source referencing (self plagiarism)

You can read more about the rules on exam cheating on the study information pages in KUnet and in the common part of the curriculum section 4.12.

Exam cheating is always sanctioned with a warning and dispelling from the exam. In most cases, the student is also expelled from the university for one semester.

Exam - Tax Policy - Fall 2020

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: Income taxation

Consider an economy where the top marginal tax rate τ applies to incomes above a threshold z^*. Denote by z^m the average income across the N individuals with incomes higher than z^*. Denote by $g(z)$ the marginal welfare weight on individuals with income z and by $G(z) > 0$ the average of $g(z)$ for individuals with income larger than z. Assume initially that the elasticity of taxable income with respect to $(1 - \tau)$ is uniform across all individuals with income above z^* and denote it by e.

(1A) **Q:** Derive the mechanical revenue gain ("ΔM"), the behavioral revenue loss ("ΔB") and the social welfare cost ("ΔW") associated with a small increase in τ and provide a brief interpretation of each expression. **Q:** Use these expressions to show that the optimal top marginal tax rate equals:

$$\tau^* = \frac{1 - G(z)}{1 - G(z) + ae} \quad \text{with } a \equiv \frac{z^m}{z^m - z^*} \tag{1}$$

(1B) Assume that $a = 2$ and $e = 0.25$. **Q:** Compute τ^* for different numerical values of $G(z)$ and illustrate the results in a simple figure (hint: use Excel or similar software). **Q:** Discuss the results with particular focus on the two special cases $G(z) = 0$ and $G(z) = 1$.

(1C) Now, assume there are two types of individual with income above z^*:
 - αN individuals with income z_1 and elasticity of taxable income e_1
 - $(1 - \alpha)N$ individuals with income z_2 and elasticity of taxable income of e_2

Q: Write the behavioral revenue effect $\Delta B'$ in a way that explicitly accounts for the two types. **Q**: Show that (1) still characterizes the optimal top marginal tax rate when e is redefined in the following way:

$$e \equiv \alpha e_1 \frac{z_1}{z^m} + (1 - \alpha)e_2 \frac{z_2}{z^m}$$

and briefly interpret this new definition of e. **Q**: Find the optimal top marginal tax rate when the parameter values are $G(z) = 0$; $a = 2$; $z_1 = \$100,000$; $z_2 = \$300,000$; $e_1 = 0.1$; $e_2 = 0.3$ and $\alpha = 0.5$ and explain briefly.

Part 2: Tax incidence

Suppose you want to estimate the incidence of taxes on beer using daily store-level information on consumer prices. Suppose that all EU member states use value taxes so that $Q_{ict} = P_{ict}(1 + \tau_{ct})$ where Q_{ict} denotes the consumer price in store i located in country c on day t; P_{ict} is the price received by the store after remitting taxes and τ_{ct} is the tax rate in percent. Suppose Germany increased its beer tax rate on 1 July 2019 for plausibly exogenous reasons, because it was compelled to do so by the European Court of Justice. Suppose you have information on Q_{ict} for a large sample of stores in the EU and information on t_{ct} for each country in the EU.

(2A) **Q**: Explain intuitively why this may or may not be a good setting for estimating the effect of beer taxes on the beer prices faced by consumers. **Q**: Describe a specific research design to implement the estimation, for instance in the form of an estimating equation or a figure sketch (where you define very precisely what is plotted). **Q**: Discuss briefly the identifying assumption underlying the design.

(2B) **Q**: Explain how the estimates from your design inform us about the economic incidence of the German beer tax. **Q**: Provide a concrete example of how an empirical estimate (e.g. $\widehat{\beta} = 0.05$) derived from your design could be translated into a measure of incidence.

(2C) Suppose you had similar data for consumer prices on wine W_{ict} and suppose there was no change in taxes on wine in any country. **Q**: Discuss whether you could exploit the data on wine prices to improve the identification of the effect of beer taxes on beer prices.

Part 3: Shorter questions

(3A) **Q:** Explain with your own words how we should expect an increase in the dividend tax to affect investment under the old view of firm taxation. **Q:** Do the same for an increase in the corporate tax.

(3B) **Q:** Explain with your own words how the international tax system creates incentives for multinational firms to report precisely zero profits (not positive nor negative profits) in some countries. **Q:** Describe briefly one or two techniques that multinational firms may use to achieve this.

(3C) **Q:** Explain with your own words why it may be optimal policy to tax home improvement services at a relatively low rate.