Summer 2016 examination

EC426
Public Economics

2015/2016 Syllabus

Instructions to candidates

Time allowed: 3 hours

This paper contains **Twelve** questions and is divided into **two** sections.

ALL candidates should answer **two** short questions and **one** long question from **each** section.

Each short question has a weight of 10% (of the overall mark) and each long question a weight of 30% (of the overall mark). In multipart questions, answer all parts.

Calculators are **not** allowed in this examination.

Section A

Short questions: Answer TWO questions (each question carries 10 marks)

1 Is a lottery an efficient way of providing public goods?
Answer: [Explain the efficiency problem arising from the fact that a pure public good is non-excludable as well non-rival. Point out that voluntary contributions will underprovide in a large economy. Explain the Morgan 2000 result on lottery funding with a fixed prize. For extra credit mention what would happen if the fixed prize were replaced with a pari-mutuel lottery]

2 Is there a case for abolishing commodity taxes?
Answer: [Outline the Atkinson-Stiglitz / Kaplow / Laroque arguments in the case of the separability of leisure. Briefly consider the plausibility of separability in practice. For extra credit mention the apparently regressive nature of commodity taxes.]

3 Explain why the mechanism underlying the positive correlation between education and wages matters for whether education should be subsidized.
Answer: In the Spence model – with high-skilled individuals getting more education to signal their skills - education plays a second best role as a screening device. Governments should support the establishment of schools to facilitate signalling, but not necessarily subsidize. If, however, education increases human capital and there are reasons why individuals invest too little in education (e.g., externalities, internalities, liquidity constraints), subsidizing education is a desirable policy.

4 Use the Baily-Chetty formula to discuss potential implications of a recession on the optimal generosity of unemployment benefits. (You do not need to provide the derivation of the formula.)
Answer: The Baily formula shows how the optimal generosity equates the consumption smoothing benefits and the moral hazard cost of additional insurance. Both are likely to change during a recession. The consumption smoothing benefits are likely to be higher during a recession (e.g., household income falls, borrowing constraints more likely to bind), the unemployment elasticity may well be lower (e.g., impact of effort on job finding probability is likely to be lower, but the job finding probability may be lower as well. A good answer points out that the Baily-Chetty formula ignores GE effects and job search externalities. These may changes as well over the business cycle.

Section A

Long questions: Answer ONE question (each question carries 30 marks)

5

(a) By what mechanisms do wealth taxes (including taxes on the transmission of wealth) affect the short-run and long-run distribution of income and wealth? (10 marks)
[Explain limited effectiveness of wealth taxation in short run: small revenue raised, limited coverage. Explain the way taxation of wealth transfers may work by influencing intra- and intergenerational savings and bequest decisions. Candidates should discuss the concept of equilibrium distribution and the way that taxation can influence it]

(b) What role is played by family structure in influencing the effectiveness of taxes on the transmission of wealth? (10 marks)
[Discuss a simple model of inheritance incorporating either different marriage patterns or heterogeneity in family size. (10 marks) Discuss equilibrium distributions in such models and the role of taxation in influencing the equilibrium.]

(c) Evaluate the long-term consequences of abolishing such taxes. (10 marks)
[Using one or more multi-generational models of wealth transmission show how taxes may affect whether the generating process of the wealth distribution converges or not. Explain the role of behavioural assumptions such as decisions about saving.]

6 This question asks you to evaluate different saving interventions for different types of savers in a two-period, representative-agent model. The agent works in the first period and receives an after-tax wage $w-\tau$. In the second period, she retires and earns no income. The agent can save or borrow freely at interest rate r (independently of the government policy). Welfare when the representative agent consumes x and c in the two respective periods equals $u(x)+\beta v(c)+\lambda[R-R_0]$ (for both types of agents specified below). λ equals the marginal cost of public funds, R equals the net present value of the government's revenues (i.e., $R=\tau$ in the absence of saving interventions) and R_0 is an exogenous resource constraint on the government.

(a) Consider an 'exponential' agent who discounts retirement consumption with the same discount factor β as the one used to evaluate welfare. Would a policy intervention that increases her savings increase welfare? How would your answer change for a 'hyperbolic' agent who discounts retirement consumption with a discount factor $b<\beta$? Discuss.

Answer: For the exponential discounter, her savings choice is efficient, so changing this will not have a FO effect on welfare due to the envelope theorem. The welfare impact of a savings increase is first-order for the hyperbolic discounter. In fact, as she saves too little, an increase in savings would increase welfare. (Of course, any policy, like a savings subsidy, will have a direct effect on utility and on the government's budget as well. But when there is no savings distortion, there is no reason to prefer this above the use of the tax.)

(b) What is the welfare impact of a mandate to save a minimum amount m through a retirement account (at interest rate r)? How is this different for an 'exponential' agent and for a 'hyperbolic' agent? (10 marks)

Answer: A mandate has no impact on total savings since the individual can simply undo the mandate through her private savings (i.e., there is 100% crowd-out). Hence, the mandate has no impact on welfare. The same is true for the hyperbolic discounter, even though he saves too little.

(c) Referring to your analysis in part (a) and part (b), what are two conditions for a savings intervention to be welfare-improving? What policy would you recommend? Why is this different from the policy recommendation for 'passive' savers in Chetty et al. (QJE 2014)? (10 marks)

Answer: The agent's savings needs to be suboptimal (only the case for hyperbolic discounters) and the intervention needs to affect her total savings level (not the case for the mandate). Empirical evidence (e.g., drop in consumption upon retirement, Chetty et al. (2014)) that individuals save too little for when they are retired. Hence, an intervention that effectively increases their total savings when retired would increase welfare. With hyperbolic discounters this could be a savings subsidy. Chetty, however, provides evidence for passive savers who do not respond to policies, making mandates effective, but subsidies not.

Section B

Short questions: Answer TWO questions (each question carries 10 marks)

7 Explain why we need to observe price variation in order to estimate the welfare cost of adverse selection. Could we still test for adverse selection when observing insurance choices and realized risks for a single cross-section of agents who all face the same price(s)?
Answer: Price variation is essential to estimate the variation in the willingness to pay (i.e., trace out the demand function) and see how much of the variation is driven by differences in costs (i.e., trace out the corresponding cost curves). The two are sufficient to estimate the welfare cost of adverse selection. We can still test for selection based on risks into insurance even if we don't have price variation. For a given set of options, do individuals who buy more coverage are more likely to have the risk realized.

8 Discuss the following statement: "The welfare gain from correcting the behaviour of a non-rational agent exceeds the welfare cost from distorting the behaviour of a rational agent."
Answer: Indeed, starting from the respective decisions these agents make, a policy intervention will have a "first-order" impact on the welfare of the non-rational agent, while it will only have a "second-order" impact on the welfare of the rational agent. The latter is already optimizing her welfare over the decisions she can make (so-called "envelope condition"). Students may illustrate this with the reduction of a DWL triangle in the first case and the introduction of a DWL triangle in the second case. A good answer would also provide an example (e.g., related to the models of smoking in lecture) and note that this is only about the introduction of the policy. It is not true that it is always better to further correct the behaviour of the former and further distort the behaviour of the latter.

9 Illustrate the welfare equivalence between taxes and quotas to reduce the production of a polluting car manufacturer. Why does this equivalence break down when manufacturers have heterogeneous production costs?
Answer: Here students should simply illustrate the DWL triangle associated with the over-production of cars and show how the optimal allocation can be achieved through an appropriate tax (and potentially paying back the revenues lumpsum) or a simple quota. When production costs are heterogeneous, the optimal production level will be different across manufacturers, so imposing a uniform quota on different manufactures would introduce production inefficiencies (or allocative inefficiencies), while a uniform tax can remain efficient in the marginal damage is constant across firms.

10 Assume that bunching at kink points depends on a structural elasticity e and a fixed adjustment cost c. If you observe bunching at a kink at two points in time – when the kink is small and when the kink is large – how can you separately estimate the elasticity and the adjustment costs? What are the identification assumptions?
Answer: See Kleven (2015), section 3.3.

Section B

Long questions: Answer ONE question (each question carries 30 marks)

11 Consider an income tax schedule $T(z)$, where z is earnings and $\tau = T'(z)$ is constant above an earnings threshold z^*. Assume that the earnings supply function of individual i in the top bracket equals $z^i = z^i(1 - \tau, x)$, where x is a vector on non-tax determinants of earnings. Assume further that the social marginal welfare weight on individuals on the top bracket equals g^*.

(a) [15 marks] Derive the optimal top marginal tax rate τ^*. Discuss the economic intuition underlying this result.
Answer: This can be derived using a simple tax perturbation approach. The key determinants of τ^* are the earnings elasticity, the Pareto parameter of the earnings distribution, and the social marginal welfare weight.

(b) [5 marks] Demonstrate the no-distortion-at-the-top result based on the previous optimal tax formula. What is the intuition for this result? What is the empirical relevance?
Answer: Follows straightforwardly from the previous results, with the intuition turning on mechanical relative to behavioural revenue effects at the upper bound of the distribution.

(c) [10 marks] Labor economists have discovered that one of the elements of the vector x is height, with taller people having higher earnings, other things being equal. If an income tax schedule $T(z,x)$ were feasible, would this empirical finding lead you to revise any of the policy conclusions in (a) and (b)?
Answer: Besides the direct tagging argument implying $\partial T/\partial x > 0$ (where x is height), there will be indirect effects on $\tau = \partial T/\partial z$ coming through the welfare weight g^* (in fact, if tagging is perfect we will have $\tau^* = 0$).

12 Consider the compliance model presented in Kleven et al. (2011). This is a modified Allingham-Sandmo model with risk-neutral taxpayers and an endogenous audit probability $p = p(e)$, where e denotes evasion and where $p'(e) > 0$.

(a) [10 marks] Derive the first-order condition for the taxpayers' optimal choice of evasion e^*. Discuss the economic intuition underlying this result.
Answer: See Kleven et al. (2011).

(b) [10 marks] Based on the condition derived above, explain how it is possible to have high compliance rates even under a low audit probability and a small penalty for evasion. Relate your argument to third-party information reporting.
Answer: The argument turns on a large elasticity of the audit/detection probability in equilibrium, i.e. on $(p'(e^*)\cdot e^*)/p$ being large. This can happen when agents have both self-reported income and third-party reported income items, and when agents in equilibrium evade on most self-reported income, but not on third-party reported income. See again Kleven et al. (2011) for details.

(c) [10 marks] Describe the available empirical evidence for (or against) the importance of third-party information in explaining compliance patterns. What type of evidence do you find most persuasive? Explain.
Answer: The students may describe evidence on heterogeneity in evasion across income categories, the within-person evidence on self-reported and third-party reported income evasion in Kleven et al. (2011), cross-country evidence, and historical time series within countries. They most persuasive evidence is arguably the within-person analysis of Kleven et al. (2011).