Public Economics Exam

June 30 2020

Susana Peralta

<mark>INSTRUCTIONS: PLEASE READ CAREFULLY</mark>

- This exam has 5 questions, numbered 1 to 5, with subquestions.

- In Question 1 you should choose <u>two, and only two</u> subquestions.

- In Question 5, you should choose <u>one, and only one</u> subquestion.

- This is a <u>open book</u> exam.

- Please have your ID ready to be checked.

- Please respect the line/page limits in each answer.

- The invigilator will not answer any queries during the exam. If you have a question that does not allow you to proceed with the answer, write down the assumption or assumptions that you deem necessary in order to proceed.

- **Communication between students, access to any written material, or to tablets and mobile phones is strictly prohibited during the exam. Failure to comply with this rule results in failing the course and is considered a serious breach of academic honesty. It will be duly communicated to the competent School authorities.**

- The exam lasts 2h30. The <u>suggested</u> time for completion is indicated in each question. It totals 135 minutes, allowing you a 15-minute slack.

Good Luck!

1. (`2 points`, 10 minutes) Give a brief definition of <u>**two**</u> of the following concepts. Feel free to complement your definition with an example. (`Maximum 10 lines per definition.`)

   (a) Condorcet winner.

   (b) Samuelson Rule of optimal public good provision.

   (c) External validity of an experimental setup.

   (d) Nudges in public policy.

2. (`6.5 points`, 45 minutes) Grey Inc. is an oil driller. It is deciding how much to invest in a new oil exploration. Grey Inc.'s market experts estimate that the benefit of each additional thousand tons of oil, t, is given by $100 - t$. The marginal cost of each thousand tons of oil exploration is given by t.

   The new oil exploration is set to take place offshore, just 10km off a beautiful strand of beaches in a coast that is famous as a surf spot. Wave Association is a local NGO that involves surf schools and local activists. Wave Association estimates that the oil exploration will damage the coast, cause loss to wild life, and decrease very heavily the surfing activity that sustains much of the local economy. Wave Association estimates that each thousand tons of oil causes a marginal damage of 80.

(a) How many thousand tons of oil will Grey Inc. decide to explore on its own?

(b) What is the social optimum quantity of oil exploration?

(c) Represent graphically both the social and Grey Inc.'s private optimum.

(d) Explain, using the concepts of private marginal benefit and private marginal cost, why $t = 80$ is not optimal for Grey Inc. You may refer to the plot on question **??**.

(e) The government is considering taxing Grey Inc. for each thousand tons of oil explored. Can you advise the government on a value for this tax?

3. (**4 points**, 20 minutes) The citizens of a city are deciding about how much containment measures to implement because of the covid-19 pandemic. There are three equal-size groups of people: (1) Type A people want as much containment as possible; (2) Type B people prefer a lot of containment to none, but they prefer none to a moderate stringent lockdown; (3) Type C people prefer medium levels to no containment, which they in turn prefer by a modest amount to high levels.

(a) Show that these preferences are not single peaked.

(b) Show that high containment measures is a Condorcet winner.

(c) Suggest a possible change in the preference profile of these three groups that makes the preferences single-peaked.

4. (**5 points**, 40 minutes) The UK government is implementing a large number of coronavirus covid-19 antibody tests for National Health Service (NHS) workers. Antibody tests check whether you have or ever had coronavirus. The World Health Organisation (WHO) says there is no evidence that people who have had coronavirus definitely become immune to it. It is important to consider how to communicate the antibody test results in a way which best conveys our current state of knowledge – that having had coronavirus likely does reduce people's risk of catching or spreading it in future, but may not eliminate the risk completely.

The Behaviroural Insights Team ran an online experiment on 6 149 UK adults, to investigate how the framing of a positive antibody test result affects the perceived risk and behaviour. The experiment was set up has follows. Each individual was randomly assigned to a different way of describing the result, with eight possible phrasings, combining the description of the test type (Immunity vs Antibody), the test result (Passport vs Certificate vs Result), or a more descriptive framing. The table below gives the number of individuals assigned to each description.

Framing	N
"an immunity passport"	768
"an immunity certificate"	784
"an antibody passport"	763
"an antibody certificate"	773
"a result showing immunity"	779
"a result showing antibodies"	754
"a result showing a high level of antibodies"	751
"a result showing they were low risk for catching coronavirus again in future"	777

(a) Explain the approach devised by the team to test people's reactions to the communication of test results. (`Maximum half page.`)

(b) Suppose that, when positive tested, the individuals think that they are immune forever. Explain how this may induce behaviour on behalf of these individuals that creates a negative externality for the rest of the society. (`Maximum half page.`)

(c) The results show that only 2% of people thought they had zero risk of catching coronavirus again when the type of test was framed as antibody, but this jumped to 6–10% when it was framed as immunity. Less than 1% of people thought they had zero risk when they read the more descriptive framings. What do you think is the preferable way to communicate the results? (`Maximum half page.`)

Make sure you only answer 5(a) <u>or</u> 5(b)

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5. (`2.5 points`, 20 minutes) Choose <u>**one**</u> of the quotes below to comment, highlighting the economic concepts that help understanding it. (`Maximum 20 lines.`)

(a) The following quote is adapted from a June 27 publication on the site VoxEu.org, "The worlds poor cannot protect themselves well from the novel coronavirus", by economists Caitlin Brown, Martin Ravallion, and Dominique van de Walle. Comment the sentence. Make sure you refer to the concepts of public goods and government spending in developing vs developed countries.

> "The belief that non-pharmaceutical measures can help contain the spread of illness is consistent with the available evidence. *(i)* learning about covid-19 prevalence in your local area through communication tools: radio, TV, phone, the internet, *(ii)* isolating, which requires a dwelling with walls, a roof, closures, and toilet, and not overcrowded, and *(iii)* regular handwashing with soap and water. However, virtually all of these recommendations require household environments that support the capacity to protect from the virus. (...) The relevance of these recommendations is questionable in the context of many developing countries."

(b) The following quote is adapted from The Financial Times, "Tech companies spent record sum on US lobbying in 2018" (January 23, 2019). Use it to discuss the concept of lobbying and its role in policy making.

> "Five of the biggest spenders – Google, Amazon, Facebook, Apple and Microsoft – spent a combined \$64m making their cases to policymakers in 2018, according to figures filed with Congress. (...) a spokesman for Citizens for Responsibility and Ethics in Washington, said: 'This is essentially how Washington works, the more potential regulation there is into an industry, the more money spent lobbying to fight it. Whenever industries are faced with congressional investigations or talk of impending major legislation, you can be sure to see an uptick in their lobbying dollars.' (...) The US technology industry has endured a difficult year, from the controversy over Cambridge Analyticas use of Facebook users data to the revelation that Google has been working on a secret plan to relaunch its search engine in China."