Written Exam Economics summer 2021

Field Experiments

18 June from 10 am to 10 pm

This exam question consists of 3 pages in total including this one

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. '1234.pdf') and uploaded to Digital Exam.

Be careful not to cheat at exams!

Exam cheating is for example if you:

- Copy other people's texts without making use of quotation marks and source referencing, so that it may appear to be your own text
- 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
- Reuse parts of a written paper that you have previously submitted and for which you have received a pass grade without making use of quotation marks or source references (self-plagiarism)
- Receive help from others in contrary to the rules laid down in part 4.12 of the Faculty of Social Science's common part of the curriculum on cooperation/sparring

You can read more about the rules on exam cheating on your Study Site and in part 4.12 of the Faculty of Social Science's common part of the curriculum.

Exam cheating is always sanctioned by a written warning and expulsion from the exam in question. In most cases, the student will also be expelled from the University for one semester.

Exam Field Experiments

Spring 2021

Please count the words of each part and write the number behind your answers.

1. **Interpreting Results and Policy Recommendations - 25% of grade** In the paper, Al-Ubaydli et al. 2020 called *"What Can We Learn From Experiments? Understanding the Threats to the Scalability of Experimental Results"*, the authors talk about different threats to external validity and scalability. They write in section II: "One common source of scaling bias is adverse heterogeneity, whereby the participants' attributes make them systematically predisposed to exhibiting a stronger relationship than in the population at large."
   (a) Explain in your own words what "adverse heterogeneity" means and why this can lead to a scaling bias. (maximum 150 words) (5% of the grade)
   (b) Choose TWO papers from the course for which you think "adverse heterogeneity" could be a problem. You can choose papers presented in the lectures, the homework videos or the student presentations. If there are multiple treatments and outcomes, you can choose one treatment and one type of outcome to make your argument. For each of the chosen papers:
      1. Name the paper (Authors and Title)
      2. Explain what the experiment was about and what the main effect was (maximum 100 words) (5% of the grade)
      3. Explain why you think there could be adverse heterogeneity among the sample (maximum 150 words) (7,5% of the grade)
      4. Should we expect a larger or smaller effect if the intervention was scaled to the full (relevant) population? (maximum 100 words) (7,5% of the grade)

2. **Discussing limitations of experimental research - 35% of grade** Read the attached paper "Indian Water Use". Tip to save time! Focus on the parts that are relevant for the questions below.
   (a) Write a summary of the research question, experimental design and main results. You can also make a graph or flowchart. Focus on what is important for discussing the experimental design. (maximum 400 words - 10% of grade)
   (b) Discuss the experimental design based on what you have learned in class. You should answer the following questions (maximum 1000 words for all sub-questions together - 25% of the grade):
      1. What were the main outcome variables? Are they well chosen? Why, why not?
      2. How were the participants selected? Was there self-selection?
      3. Was there stratification before randomization? If yes, on what variables? If no, what would you suggest?
      4. Is there attrition from the experiment? What type of attrition? If yes, how could it affect the results?
      5. Is the experiment well-powered? What evidence do you have for that?
      6. Is it likely that there was a Hawthorne effect? How could it affect the results?
      7. Is there evidence of spillover effects? If yes, how could they be mitigated?
      8. What is a experimental design problem that has not been covered by the questions above? Why is it a problem?

3. **Designing your own experiment - 40% of the grade** The pandemic has strongly affected teaching and learning at the university. The study board at KU is interested in the answer to the following research question: *Are students' learning outcomes higher when TA sessions are live (but virtual) compared to TA sessions being pre-recorded with a one-hour per week office hour to ask questions?* There are no differences in content between TA sessions (the problem sets are the same for all students).

   You are tasked to find an answer for the study board. They give you 10,000kr and 6 months maximum for the task. The dean of the Faculty of Social Science has agreed that you can use students from his faculty for the experiment. You do not need to use all of the money or the time. It is important that the experiment is doable in the given time, with the money and amount of students available. He wants to see a detailed proposal/ pre-analysis plan from you how you will tackle the question. It is important for him that the experiment is ethical and it does not place an unnecessary burden on the students in the experiment (maximum 2000 words for all sub-questions together).

   Remember! You are supposed to answer the question posed by the dean - this is a program evaluation. You are not supposed to come up with alternative interventions.

   (a) Write up the experimental design - Elements to consider are: Outcomes, level and process of randomization, number of observations, length of the experiment...

   (b) For each element of the design you should argue why you have made this design choice based on what we have covered in class.

   (c) Discuss what problems could arise and how your design intends to control for those.

   (d) Explain briefly what analysis you will conduct with the data you collected to test for the effect.