



Stockholm
University

Department of Economics

Course name: Econometrics 3a

Course code: EC7412

Type of exam: Written

Examiner: Mårten Palme

Number of credits: 7,5

Date of exam: 28 August, 2020

Examination time: 9-12

Aids: Calculator, literature and lecture notes.

Write your personal identity number on each answer sheet.

Start each new part on a new answer sheet.

Explain notions/concepts and symbols. If you think that a question is vaguely formulated, specify the conditions used for solving it. Only legible exams will be marked.

The exam consists of 3 parts. Part 1 is worth 30 points and parts 2 and 3 are worth 35 points each, 100 points in total. For the grade E 45 points are required, for D 50 points, C 60 points, B 75 points and A 90 points.

Your results will normally be made available on your Ladok account (www.student.ladok.se) within 15 working days from the date of the examination.

Good luck!

1. Models with binary dependent variable.

- a. Set up a Random Utility Model (RUM) for the choice between two modes of transportation that differs in their speed and monetary cost.
- b. Suppose you have used probit to estimate the model $P(Y_i = 1) = \alpha + \beta X_i + \gamma Z_i + \varepsilon_i$, where Y_i is binary and $\varepsilon_i \sim N(0, \sigma)$. Describe two different test procedures to test the restriction $\gamma = 0$.
- c. Suppose that you want to estimate a model with a binary dependent variable. Explain under what conditions a Linear probability model (OLS) may give consistent estimates. Describe also a data structure and a model where this condition is automatically fulfilled.

2. Hazard models.

- a. Suppose you want to estimate an econometric model where the dependent variable is durations in a particular state. Explain under what conditions OLS may give consistent estimates.
- b. Explain briefly (i) the identification strategy; (ii) the econometric model; (iii) the results of the paper Carling, K., Holmlund, B., & Vejsiu, A. (2001) "Do benefit cuts boost job finding? Swedish evidence from the 1990s".
- c. Explain the difference between true (intrinsic) duration dependence and spurious duration dependence caused by heterogeneity in proportional hazard models. Give examples of data that can generate true and spurious duration dependence, respectively. How can you allow for true duration dependence in a proportional hazard model?

3. Panel data models.

- a. Explain how the authors make use of a fixed effects model in the paper: Krueger & Ashenfelter "Estimates of the economic return to schooling from a new sample of twins". What problem does it solve? Discuss potential criticism of their approach.
- b. Explain the additional assumption, compared to fixed effects models, necessary for consistency of random effects panel data models. Explain how it can be tested.
- c. Suppose you now want to estimate panel data model with fixed effects and a lagged dependent variable, i.e., $Y_{it} = \alpha_i + \gamma Y_{it-1} + \beta X_i + \varepsilon_i$. Show that a conventional first difference or a fixed effects estimator of γ may be inconsistent and explain briefly how the Anderson-Hsiao estimator may be consistent.