

**Course name:** Econometrics 3a: Methods for  
Analyzing Micro Data  
**Course code:** EC7412  
**Examiner:** Mårten Palme  
**Number of credits:** 7,5 credits  
**Date of exam:** June 1, 2016  
**Examination time:** 3 hours

Write your identification number on each paper and cover sheet (the number stated in the upper right hand corner on your exam cover).

Do not write answers to more than one question in the same cover 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. No aids are allowed.

-----

The exam consists of 3 questions. Questions 1 and 2 are worth 35 points and question 3 is worth 30 points, 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.

-----

Results will be posted on mitt.su.se three weeks after the exam, at the latest

-----

**Good luck!**

1.
  - a. In the context of binary outcomes, explain the difference between a Random utility model (RUM) and a latent variable threshold model.
  - b. Define a likelihood ratio test and describe how it can be used to test between a proposed model and a saturated model.
  - c. Explain why a Linear probability model (LPM) may give inconsistent estimates and explain why this can be avoided when you only have categorical independent variables in your model.
2.
  - a. Suppose you want to estimate the average treatment effect of military service on subsequent labor market outcomes. Define a matching estimator for this problem and explain how it differs from an OLS estimator in this context.
  - b. (i) Explain a situation when missing observations may not cause selection bias in a linear OLS model on cross-section data. (ii) Explain why missing observations may not cause selection bias in a Fixed effects panel data model, while it causes such problem in an equivalent OLS model on a cross-section obtained from the panel data you use.
  - c. Suppose you now want to estimate a panel data model with fixed effects and a lagged dependent variable, i.e.,  $Y_{it} = \alpha_i + \gamma Y_{it-1} + \varepsilon_i$ . Explain why a conventional fixed effects estimator may give inconsistent estimates in short panels and define the Anderson-Hsiao estimator of this model.
3.
  - a. Explain why individual heterogeneity may appear as duration dependence and describe briefly how you can handle duration dependence and heterogeneity, respectively, in a proportional hazard model.
  - b. Describe how you can differentiate between different exit routes in the framework of a Cox proportional hazard model. Describe how you can obtain consistent estimates in such model and what assumptions you need?
  - c. Define Cox-Snell generalized residuals in the framework of a proportional hazard model and describe how they may be used to perform a mis-specification test of the model.