



## Faculty of Economics and Econometrics

**On this first page, you will find important information on the examination.**

**Before starting with the examination you should read this information!**

### **Examination: Microeconometrics (80016)**

**Date and time of the examination:** July 8<sup>th</sup> 2005, 14:00h – 17:00h

**Duration examination:** 3 hours

You have to identify yourself with the UvA-identification card or your UvA studentcard and passport or drivers license or any other valid proof of identification for students containing a photograph.

If you did not register for this examination, your exam will not be checked. If you believe that your examination should be checked despite of this omission, you can write a letter to the Director of the Teaching Institute specifying arguments and containing proof of your claims.

**Add your name and studentnumber to every  
sheet of paper you hand in.**

**Warning against fraud:** Do not fraud! In the case if fraud the maximum punishment is exclusion to all examinations for one year.

Your mobile phone should be switched off and should be put in your briefcase. Your briefcase should be closed and standing on the floor to the left <right> of your desk.

During the examination you are not allowed to go to the toilet unless the coordination envissilator give you permission to do so.

**Allowed tools:** open book examination.

**Specific information on this examination:** 7 exercises, maximum number of points: 70, maximum number of point for computer assignments: 30, sufficient grade if sum larger than 54.

**The result of this examination will be published within 18 working days after the date of this examination.**

**Reviewing the examination:** Please contact the lecturer for an individual appointment ([j.c.m.vanophem@uva.nl](mailto:j.c.m.vanophem@uva.nl))

You are entitled to a copy of this examination and a copy of the solutions (a small fee might be charged)

**Good luck!**

**Exercise 1 (10).**

Consider testing on heteroskedasticity in the probit model. Basically you have three options. Discuss (and explain) the pros and cons of each method.

**Exercise 2 (10=5+5).**

You estimate a multinomial logit model on car choice. Five categories of cars are distinguished:  $j = 1$ : small,  $j = 2$ : medium,  $j = 3$ : large,  $j = 4$ : off-the-road and  $j = 5$ : sports cars. Both individual and category specific explanatory variables are used.  $j = 5$  is the reference category.

- The estimation results reveal that the coefficient of income for category  $j = 2$  equals -0.75. Give an interpretation of this estimate.
- The coefficient of price is 1.2. Also interpret.

**Exercise 3 (10=4+3+3).**

a). Assume that a duration  $t$  has distribution  $f(t)$ . Express the density  $f(t)$  and the cumulative distribution function  $F(t)$  in terms of the hazard function  $\lambda(t)$ . What are the restrictions on the hazard function and the integrated hazard function?

b). Consider the Burr distribution. Its hazard function is:

$$\lambda(t) = \frac{\gamma \alpha t^{\alpha-1}}{1 + \sigma^2 \gamma t^\alpha}$$

Determine the density, cumulative distribution, survivor and integrated hazard functions.

c). Does the Burr hazard belong to the class of proportional hazard models. If yes, why? If not, why not and do there exist parameter restrictions under which it does belong to this class?

**Exercise 4 (10=5+5).**

Consider the paper of Audretsch (1991).

- What model is estimated?
- Explain the statement: "..., ordinary least squares estimation would produce inefficient variances of the estimated coefficients ..."(page 446, second column, 14 lines from below).

**Exercise 5 (10=3+7).**

Consider the paper of Bjorklund and Moffitt.

- In Table 1 a number of models are estimated. Can you test the full model (1) against the complete reward homogeneity-model (5)? If yes, do so. If no, explain.
- Bjorklund and Moffitt use several explanatory variables for the rewards- and costs heterogeneity. An alternative to using ML (like Moffitt and Bjorklund) is to estimate equation (4) (p.43) with IV. What are the advantages and disadvantages of both methods and propose a method to estimate equation (4) with IV.

**Exercise 6 (10=5+5).**

Consider the paper of Grogger.

- QML estimation of count data by using the Poisson model gives consistent estimates of  $\beta$ . Does it give a consistent estimated of  $\lambda$  and the probability of observing a certain count?
- Explain the test of hypothesis (1) (p. 299).

**Exercise 7 (10).**

Do exercise 16.9 from the book of Wooldridge (page 547).