Advanced Demographic Methods 2:
Further Topics and an Empirical Project in Event-History Analysis

7.5 ECTS credits

Course code:

Instructors: Sven Drefahl and Juho Härkönen

Required background

Course *Advanced Demographic Methods 1* or equivalent introduction course to event-history analysis (also known as survival analysis, hazard regression, duration data analysis) and knowledge of the statistical package Stata.

Course description

In this Master's / PhD level course, students will learn how to apply event-history techniques to duration data. The course is a continuation of "Advanced Demographic Methods 2: An Introduction to Event-History Analysis" and provides further knowledge of topics such as different parametric models, Cox regression models, discrete-time models, selection issues, repeated events, and competing risks. Throughout the course students will apply event-history techniques to own research projects.

Course objectives

After completing the course students will be able to:

- Understand advantages, disadvantages and requirements for using the Cox model, different parametric survival models, and discrete-time event-history models.
- Recognize right-censored, left-censored, and interval-censored data and understand its implication for duration data analysis.
- Understand the concept of heterogeneity and selection and have knowledge about possible ways to address these issues.
- State and recognize some of the limitations of event-history analysis.
- Conduct own empirical event-history analysis using appropriate duration data.
- Interpret the results of empirical event-history analysis and relate them to existing literature
- Communicate the output of own analyses

Using *Stata*:

- Compute advanced multivariate event-history analyses

Teaching

The course is given full-time over a 5 week period. Coursework and examination consist of lectures, computer-based exercises, and an own analysis and interpretation of event-history data; preferably from the course participants' own research projects.

Examination

Examination is based on active participation, computer exercises, and an own research project. Students are graded according to **16** separate criteria (specified below). Each criterion is graded "Fail" (0 points), "Pass" (1 point), or "Good" (2 points).

1. Participation is evaluated by the student's attendance in the lectures and the computer exercises, including active participation in discussions of the assigned readings.

2. – 6. Each of the 5 computer exercises is evaluated separately. The computer exercises should include proper solutions to the assigned problems and clear presentations in the Stata-syntax ("do-files") and the output.

7. – 16. The **research project** consists of an independent study using event-history analysis. The study can be conducted using own data or data provided by the instructors. The following aspects are evaluated:

7. Motivation of choice of data and method for the research question.
8. Data description.
9. Data manipulation and variable construction.
10. Appropriate model specification for multivariate analysis.
11. Execution of descriptive analyses.
12. Execution of multivariate analyses.
13. Description of results.
14. Interpretation and discussion of results (including limitations).
15. Stata-syntax ("do-files") that is clear and easy to follow.
16. Presentation of the research project in class.

The maximum number of points a student can attain is 32. In addition, extraordinary performance in any of the above mentioned aspects can be rewarded with up to 2 extra points that can compensate for potential shortcomings in other areas.

The final course grade is based on the following criteria:

A (Excellent) = 29-32 points

B (Very good) = 26-28 points

C (Good) = 23-25 points

D (Satisfactory) = 20-22 points

E (Sufficient) = 16-19 points

Fx (Insufficient) = Fail for one or two of the aspects specified above

F (Fail) = Fail more than two

Course book

- Blossfeld, H-P, Golsch, K. & Rohwer, G. 2007. Event History Analysis Using Stata. Lawrence Erlbaum. (hereafter, BGR)

Course schedule

Fri Dec 7 (9am - 12) — **Introduction: Summary of ADMI / Parametric analysis (lecture), B900**

Compulsory readings

- BGR 182-222

Further readings

- Diekmann, A., Engelhardt, H. (1999) The Social Inheritance of Divorce: Effects of Parent's Family Type in Postwar Germany. *American Sociological Review*, 64(6), 783-793
  Fulltext pdf: http://www.jstor.org/stable/10.2307/2657402
- Drefahl, S. (2010) How Does the Age Gap Between Spouses Affect Their Survival? *Demography*, 47(2): p. 313-326.
  Fulltext pdf: http://dx.doi.org/10.1353/dem.0.0106

Fri Dec 7 (2pm - 4pm) — **Parametric analysis (computer exercise), B397**

Mon Dec 10 (10am - 12) — **Cox regression (lecture), B900**

Compulsory readings

- BGR 223-246

Additional readings

- Drefahl, S. (2012), Do the Married Really Live Longer? The Role of Cohabitation and Socioeconomic Status. *Journal of Marriage and Family*, 74(3): p. 462-475.
  Fulltext pdf: http://onlinelibrary.wiley.com/doi/10.1111/j.1741-3737.2012.00968.x/abstract
- Box-Steffensmeier, J.M. 1996. A dynamic analysis of the role of war chests on campaign strategy. *American Journal of Political Science* 40(2): 352-371.
  Fulltext pdf: http://www.jstor.org/stable/10.2307/2111628

Mon Dec 10 (2pm - 4pm) — **Cox regression (computer exercise), B397**

Wed Dec 12 (8am – 10am) — **Discrete-time analysis (lecture), B900**

Compulsory readings

- Allison, P. (1984) Event History Analysis. Sage, pages 14-22
  (In Course Compendium)

Additional readings

Iceland, J. 1997. Urban labor markets and individual transitions out of poverty. *Demography* 34(3): 429-441.

Fulltext pdf: http://www.springerlink.com/content/37366028m5253382/
Western, B. 1995. A comparative study of working class disorganization: Union decline in eighteen advanced capitalist countries. *American Sociological Review* 60(2): 179-201.
Fulltext pdf: http://www.jstor.org/stable/10.2307/2096383

Thu Dec 13 (2pm – 4pm) **Discrete-time analysis (computer exercise), B397**

Mon Dec 17 (10am - 12) **Selection: Frailty, left censoring, and causal inference (lecture), B900**

Compulsory readings

- BGR 247-270

Additional readings

- Bhrolcháin, M.N., Dyson T. (2007) On Causation in Demography: Issues and Illustrations. *Population and Development Review* , Vol. 33, No. 1, pp. 1-36
  Fulltext pdf: http://www.jstor.org/stable/25434583
- Guo, G. (1993) Event history analyses for left-truncated data, *Sociological Methodology*, 23: 217-43.
  Fulltext pdf: http://www.jstor.org/stable/271011
- Lillard, L. A., & Panis, C. W. A. (1996). Marital status and mortality: The role of health. *Demography*, 33(3), 313-327.
  Fulltext pdf: http://www.jstor.org/stable/10.2307/2061764
- Vaupel, J. W., & Yashin, A. I. (1985). Heterogeneity's Ruses: Some Surprising Effects of Selection on Population Dynamics. *The American Statistician*, 39(3), 176-184.
  Fulltext pdf: http://www.jstor.org/stable/2683925
- Yashin, A.I. et al. (2000) Hidden Frailty: Myths and Reality
  Fulltext pdf: http://user.demogr.mpg.de/jwv/pdf/RR34.pdf

Mon Dec 17 (2pm – 4pm) **Model Specification and testing (computer exercise), B397**

Wed Dec 19 (10am - 12) **Repeated events and competing risks (lecture), B900**

Compulsory readings

- BGR 101-115
- Cleves, M., Gutierrez, R.G., Gould, W. & Marchenko, Y.V. 2010. *An Introduction to Survival Analysis Using Stata*. Stata Press, pages 365-391
  (In Course Compendium)

Additional readings

- Härkönen, J. Dronkers J. (2012) Family Forerunners-parental separation and union formation
  (In Course Compendium)
- Coviello, V. and Boggess, M. 2004. Cumulative incidence estimation in the presence of competing risks. *The Stata Journal* 4(2): 103-112.
  Fulltext pdf:
  http://ageconsearch.umn.edu/bitstream/116230/2/sjart_st0059.pdf
- Berrington, A. and Diamond, I. 2002. Marriage of cohabitation? A competing risks analysis of first-partnership formation among the 1958 British birth cohort. *Journal of the Royal Statistical Association—Series A (Statistics in Society)* 163(2): 127-151.
  Fulltext pdf: http://onlinelibrary.wiley.com/doi/10.1111/1467-985X.00162/pdf
- Poortman, A.R. and Lyngstad, T.H. 2007. Dissolution risks in first and higher order marital and cohabiting unions. *Social Science Research* 36(4): 1431-1446. *Fulltext pdf:*
  http://www.sciencedirect.com/science/article/pii/S0049089X07000154

Wed Dec 19 (2pm – 4pm) **Repeated events and competing risks (computer exercise), B397**

Thu Dec 20 (9am - 12) **Generalizations and Limitations (lecture); Student presentations of planned research projects, B900**

Compulsory readings

- Bernardi, F. (2001) Is it a Timing or a Probability Effect? Four Simulations and an Application of Transition Rate Models to the Analysis of Unemployment Exit. *Quality & Quantity*, 35(3), 231-252
  Fulltext pdf: http://www.springerlink.com/content/j8g560806116x517/

Additional readings

- Goldstein, J. (2001) Marriage Delayed or Marriage Forgone? New Cohort Forecasts of First Marriage for U.S. Women. *American Sociological Review*, 66(4), 506-519
  Fulltext pdf: http://www.jstor.org/stable/3088920
- Box-Steffensmeier, J.M. and Jones, B.S. 1997. Time is of the essence: event history models in political sciences. *American Journal of Political Science* 41(4): 1414-1461.
  Fulltext pdf: http://www.jstor.org/stable/10.2307/2960496

Tue Jan 8 (10am - 12) **Progress seminar, B900**

Wed Jan 16 (10am – 1pm) **Presentation of students' projects, B900**