PRELIMINARY COURSE SCHEDULE AS OF SEPTEMBER 24th

Advanced Demographic Methods 1: An Introduction to Event-History Analysis

7.5 ECTS credits

Course code:

Instructors: Sven Drefahl and Juho Härkönen

Background

Course *Basic Demographic Methods* and/or statistical methods course on regression analysis.

Course description

This course is an introduction to event-history analysis (also known as survival analysis, hazard regression, intensity regression, or duration data analysis) and is given at the advanced (Masters / PhD level). Duration data is commonly used to address many research questions in demography, social sciences, and epidemiology. Examples of such questions are: Which factors influence how long people live, how long they stay unemployed, or when do they start a family? This course introduces the techniques for analyzing such questions and data and covers univariate and basic multivariate (regression) methods for analysis of duration (event-history) data. Students also learn data management skills that are specific to conducting event-history analysis in Stata. Further topics are covered in the follow-up course Advanced Demographic Methods 2.

Expected learning results

By the end of the course, students should be able to:

- Understand the link between event-history analysis, basic demographic methods and regression analysis
- Recognize the type of research questions addressed by event history analysis
- Understand the basic data layout of event history analysis and how data can be transformed into this layout
- Understand the basic concepts of event-history analysis
- Interpret studies that have used basic event-history methods
- Recognize the assumptions, problems and limitations of event-history methods

Using *Stata*:

- Transform data into the basic data layout of event history analysis
- Compute univariate and multivariate event-history analyses
- Specify appropriate models using time-constant and time-varying explanatory variables
- Communicate analyses done and results obtained to experts and non-experts alike

Teaching

The course is given half-time over a 9 week period. Coursework and examination consist of lectures, research output from demographic studies, and computer-based exercises. The exercises are done with the latest Stata statistical package using data from the European Social Survey (round 3). Students will receive feedback after each computer exercise.

Examination

Examination is based on active participation including a short study presentation, computer exercises, and a take-home exam. Students are graded according to **15** separate evaluations (specified below), and each is graded Fail (0 points), Pass (1 point), Good (2 points).

Participation (1. – 2.) is evaluated by the student's attendance in lectures and computer exercises, including discussion of the assigned readings (**1.**) and a brief oral presentation of a particular research question that can be addressed with event-history analysis (**2.**).

Each of the five computer exercises is evaluated **(3. – 7.)**. The computer exercises should include proper solutions to the assigned problems and clear presentations of the Stata-syntax ("do-files") and the output.

The **take-home exam (8. – 15.)** consists of a small independent study using event-history analysis. The study can be done with own data or data provided by the instructors. The following aspects are evaluated:

8. Argument for research question and choice of data and method
9. Data description, manipulation and variable construction)
10. Stata-syntax ("do-files") that are clear and easy to follow
11. Descriptive analyses
12. Appropriate model specification for multivariate analysis
13. Execution of multivariate analysis
14. Presentation of results
15. Interpretation of results (including limitations)

The maximum number of points a student can attain is 30. In addition, extraordinary performance in any of the aspects can be rewarded with up to 2 extra points that can compensate for any shortcomings.

The final course grade is based on the following criteria:

A (Excellent) = 28-30 points

B (Very good) = 25-27 points

C (Good) = 22-24 points

D (Satisfactory) = 19-21 points

E (Sufficient) = 15-18 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)

Additional literature

Cleves, M., Gutierrez, R.G., Gould, W. & Marchenko, Y.V. 2010. An Introduction to Survival Analysis Using Stata. Stata Press. (hereafter, CGGM)

Mills, Melinda. 2011. Introducing Survival and Event History Analysis. Sage

Kleinbaum, David G./Klein, Mitchel (2005): Survival Analysis: A Self-Learning Text. 2nd Edition. New York: Springer. (hereafter, KK).

Course schedule and readings

Thu Oct 4
10am - 1pm

Introduction: What is event-history analysis and why do we use it (lecture)?, B900

Compulsory readings

- BGR, pages 1-12.
- KK, pages 4-8.
- Dykstra, Pearl and van Wissen, Leo, 1999. Introduction: The life course approach as an interdisciplinary framework for population studies. In: van Wissen, L.J.G. and Dykstra, P.A. (eds.) *Population Issues: An Interdisciplinary Focus*. New York: Kluwer Academic/ Plenum Publishers, 1-14.
  (In Course Compendium)

Tue Oct 9
3pm – 5pm

Event-history data and event-history questions (lecture), B900

Compulsory readings

- BGR, pages 38-57

Wed Oct 10
10am-12 noon

Stata and data (computer exercise), B389

Tue Oct 16
3 pm -6 pm

Rates, duration, survival, hazard, and cumulative functions (lecture), B900

Compulsory readings

- BGR, pages 31-37, 58-85

Additional readings

- Breslow N.E. and N. E. Day, 1980. *Statistical Methods in Cancer Research, Volume 1 - The Analysis of Case-Control Studies*. Lyon: International Agency for Research on Cancer. Selected pages of Sections 2.1 through 2.7.
  (In Course Compendium)
- Andersson, Gunnar and Philipov, Dimiter (2002). Life-table representations of family dynamics in Sweden, Hungary, and 14 other FFS countries. *Demographic Research* 7(4): 67-144.
  Fulltext pdf: http://dx.doi.org/10.4054/DemRes.2002.7.4
- Kan, Maxim (2012). Ethnic-specific Reproductive Behavior in Independent Kazakhstan. Stockholm Research Reports in Demography 2012:15
  Fulltext pdf: http://www.suda.su.se/SRRD/SRRD_2012_15.pdf

Thu Oct 18
10am-12 noon

Life-tables and Kaplan-Meier estimates (computer exercise), B389

Tue Oct 23
3 pm -5 pm

Standardization, regression, and event-history analysis (lecture), B900

Compulsory readings

- Hoem, Jan, 1993. Classical demographic methods of analysis and modern event-history techniques. *IUSSP: 22nd International Population Conference, Montreal, Canada*, Volume 3: 281-291. *Stockholm Research Reports in Demography* 75.
  (In Course Compendium)

Additional readings

- Das Gupta, P. 1993. Standardization and decomposition of rates: a user's manual. US Census Bureau.
  (In Course Compendium)

Thu Oct 25 10am-12 noon **Event-history models: Exponential functions (lecture), B900**

Compulsory readings

- BGR, pages 87-101

Tue Oct 30 3 pm -5 pm **Event-history models: Piecewise exponential functions (lecture), B900**

Compulsory readings

- BGR, pages 116-127

Additional readings

- Grunow, D. and Mayer, K.U. 2007. How Stable Are Working Lives? Occupational Stability and Mobility in West Germany 1940s-2000. CIQLE Working Paper 2007-03. New Haven (CT): Yale.
  Fulltext pdf:
  http://www.yale.edu/ciqle/CIQLEPAPERS/CIQLEWP2007-3.pdf
- Ramirez, F.O., Souzal, Y., & Shanahan, S. 1997. The changing logic of political citizenship: cross-national acquisition of women's suffrage rights, 1890 to 1990. *American Sociological Review*, 62(5), 735-745.
  Fulltext pdf: http://www.jstor.org/stable/2657357
- Li, Ma (2009). Social Policy and Childbearing Behavior in Japan since the 1960s: An Individual Level Perspective. Stockholm Research Reports in Demography 2009:10
  Fulltext pdf: http://www.suda.su.se/SRRD/SRRD_2009_10.pdf

Wed Oct 31 10am-12 noon **Exponential and piecewise exponential regression (computer exercise), B389**

Mon Nov 5 1 pm -3 pm **Time-varying covariates and interactions (lecture), B900**

Compulsory readings

- BGR, pages 128-152
- Jaccard, J. 2001. Interactions in Logistic Regression, especially page 1-2, 12-46
  (In Course Compendium)

Additional readings

- BGR, page 152-181

- Härkönen, J. (2005). Divorce risk factors across Finnish marriage cohorts, 1954-1989. *Yearbook of Population Research in Finland*, 41, 151-164
  Fulltext pdf: http://www.yale.edu/ciqle/PUBLICATIONS/Harkonen-DivorceRiskFactors.pdf
- Andersson, Gunnar, 1998. ―Trends in marriage formation in Sweden 1971-1993. European Journal of Population 14(2): 157-178.
  Fulltext pdf:
  http://www.springerlink.com/content/w5t26572k4750227

Tue Nov 6
3 pm -5 pm
Time-varying covariates and interactions (computer exercise), B389

Thu Nov 8
10am-12 noon
Model specification and post-estimation (lecture), B900

Compulsory readings
- BGR, pages 119-121
- Hosmer, David W., Lemeshow, Stanley (2008) Applied Survival Analysis: Regression Modeling of Time to Event Data, 2nd edition (Wiley Series in Probability and Statistics), pages 132 – 165
  (In Course Compendium)

Tue Nov 13
3 pm -5 pm
Model specification and post-estimation (computer exercise), B389

Wed Nov 14
10am-12 noon
Anticipatory analyses, generalizations and course summary (lecture), B900

Compulsory readings
- Hoem, Jan M., Kreyenfeld, Michaela (2006). Anticipatory analysis and its alternatives in life-course research. Part 1: Education and first childbearing. *Demographic Research*, 15:16, 461-484 (2006)
  Fulltext pdf: http://dx.doi.org/10.4054/DemRes.2006.15.16

Additional readings
- Jan M. Hoem 1996, "The harmfulness or harmlessness of using an anticipatory regressor…", *Yearbook of Population Research in Finland* 33: 34-43.
  (In Course Compendium)
- Härkönen, J. (2008). Labour force dynamics and the obesity gap in female unemployment in Finland. *Research on Finnish Society*, 1, 3-15.
  Fulltext pdf: http://finnresearch.fi/rfs2008_01_a1_3_15_haerkonen.pdf

Wed Nov 14
2 pm -4 pm
Setting up for independent work (computer exercise), B389