Stockholm University

Event-History Analysis: Regression for Longitudinal Event Data

Course syllabus for advanced level course (SO7133)

7.5 credits, Spring 2025

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Teachers
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Entry Requirements
Bachelor's degree or equivalent, **and** *English 6* or equivalent (corresponds to European reference level B2), **and** *Quantitative Methods in the Social Sciences I – Introduction to Regression Analysis* or equivalent.

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.

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

- Describe the basic concepts of event-history analysis
- Understand the link between event-history analysis, basic demographic methods and regression analysis
- Recognize the type of research questions for which event history analysis would be a suitable method
- Interpret studies that have used basic event-history methods
- Reflect on the assumptions, problems and limitations of event-history methods

Using *Stata*:

- Transform data into the basic data layout of event history analysis
- Analyze time-dependent univariate and multivariate relationships
- Specify appropriate regression models using time-constant and time-varying explanatory variables
- Interpret results obtained and communicate them 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. 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 with 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

Examination according to this syllabus can be completed up to three semesters after it expires.

Plagiarism, cheating and unauthorized cooperation
As part of your responsibility as a student, you have to be familiar with the rules for examination. Detailed information is available at the institution's and Stockholm University's website www.su.se/regelboken. Teachers are obliged to report suspicion of cheating and plagiarism to the Director of Studies and the Disciplinary Board. An example of plagiarism is to formally or almost verbatimly write a text (also applies to single sentences) and without indicating where this comes from. This also applies to texts you have previously written (self-plagiarism). Having study groups together is encouraged, but when it comes to exam assignments, you must be careful to work for yourself (unless otherwise stated) in order not to risk it being counted as unauthorized cooperation.

Literature
The course book and other suggested books are listed here, while all other readings for each session are listed in the course schedule below. Most readings can be accessed online from an SU computer. Readings that are not available online can be found in the course compendium (.pdf file available from Athena).

Course book

- Blossfeld, H-P, Golsch, K. & Rohwer, G. 2019. Event History Analysis Using Stata. Second Edition, Routledge. (hereafter, **BGR**)
  (The first edition can be used as well but page numbers vary)

Other suggested books:

- Cleves, M., Gould, W. & Marchenko, Y.V. 2016. An Introduction to Survival Analysis Using Stata. Revised Third Edition, Stata Press.

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

Other reading material
(Fulltext access for some items might be limited to SU computers)

1. Allison, P. (1984) Event History Analysis. Sage, pages 14-22
   (In course compendium)
2. Andersson, G. (1998). Trends in marriage formation in Sweden 1971-1993. *European Journal of Population* 14(2): 157-178.
   Fulltext pdf: http://rdcu.be/Fh4G
3. Andersson, G. and D. Philipov (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
4. Andersson, G. and S. Drefahl (2017). Long-distance Migration and Mortality in Sweden: Testing the Salmon Bias and Healthy Migrant Hypotheses. *Population Space and Place* 23(4)
   Fulltext pdf: http://doi.org/10.1002/psp.2032
5. Buis, Maarten L. (2010) Stata tip 87: Interpretation of interactions in nonlinear models. *The Stata Journal* 10(2), pp. 305–308
   Fulltext pdf: https://doi.org/10.1177/1536867X1001000211
6. 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)
7. Coviello, V. and M. Boggess (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
8. 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
9. Drefahl, S and E. Mussino (2023) How does the age of the youngest child affect parental survival? Genus 79 (1), 10
   Fulltext pdf: https://doi.org/10.1186/s41118-023-00190-0
10. Dykstra, P. and L. van Wissen (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.
    Fulltext pdf: http://dx.doi.org/10.1007/978-94-011-4389-9_1
11. Härkönen, J. (2005). Divorce risk factors across Finnish marriage cohorts, 1954-1989. *Yearbook of Population Research in Finland*, 41, 151-164
    Fulltext pdf: http://journal.fi/fypr/article/view/45019/11297
12. Härkönen, J. (2014) A note on interactions in event-history models
    (In course compendium)

13. Hoem, J.M. and M. Kreyenfeld (2006). Anticipatory analysis and its alternatives in life-course research. Part 1: Education and first childbearing. *Demographic Research*, 15:16, 461-484
Fulltext pdf: http://dx.doi.org/10.4054/DemRes.2006.15.16
14. Hoem, J.M. (1996). The harmfulness or harmlessness of using an anticipatory regressor…, *Yearbook of Population Research in Finland* 33: 34-43.
(In course compendium)
15. Hoem, J.M. (2014). The dangers of conditioning on the time of occurrence of one demographic event in the analysis of another. *Population Studies*, 68(2): 151-159
Fulltext pdf: http://dx.doi.org/10.1080/00324728.2013.843019
16. Hosmer, D.W. and S. Lemeshow (2008) Applied Survival Analysis: Regression Modeling of Time to Event Data, 2nd edition (Wiley Series in Probability and Statistics), pages 132 – 136
(In course compendium)
17. Jaccard, J. (2001). Interactions in Logistic Regression, especially pages 1-2, 12-23
(In course compendium)
Fulltext also available from SU computers: http://srmo.sagepub.com/view/interaction-effects-in-logistic-regression/SAGE.xml?rskey=XPc5Xj&row=1
18. Kulu, H., Hannemann, T., Pailhé, A., Neels, K., Krapf, S., González-Ferrer, A., & Andersson, G. (2017). Fertility by birth order among the descendants of immigrants in selected European countries. Population and Development Review, 43(1), 31-60.
Fulltext pdf: https://doi.org/10.1111/padr.12037
19. Kleinbaum, David G./Klein, Mitchel (2005): Survival Analysis: A Self-Learning Text. 2nd Edition. New York: Springer, 4-8
(In course compendium)
20. Kreyenfeld, M. and Andersson, G. (2014) Socioeconomic differences in the unemployment and fertility nexus: Evidence from Denmark and Germany. *Advances in Life Course Research*,
Fulltext pdf: http://dx.doi.org/10.1016/j.alcr.2014.01.007
21. Mussino, E. and S. Strozza (2012) The fertility of immigrants after arrival: The Italian case. *Demographic Research*, 26(4): 99-130
Fulltext pdf: http://doi.org/10.4054/DemRes.2012.26.4
22. 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
23. Wallace, M., & Kulu, H. (2015). Mortality among immigrants in England and Wales by major causes of death, 1971–2012: a longitudinal analysis of register-based data. Social Science & Medicine, 147, 209-221.
Fulltext pdf: https://doi.org/10.1016/j.socscimed.2015.10.060