

EDUC-771: Topics - Panel Data and Event History Methods Fall 2023

Instructor: Brian McCall [REDACTED]
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Optional Texts:

Dirk F. Moore (2016). *Applied Survival Analysis Using R*. Springer. ISBN 978-3-319-31245-3.

Gerhard Tutz and Mathias Schmid (2016). *Modeling Discrete Time-to-Event Data*. Springer. ISBN 978-3-319-28158-2.

Göran Broström (2012). *Event History Analysis with R*. CRC Press. ISBN 978-1-4398-3167-0.

Yves Croissant and Giovanni Millo (2018). *Panel Data Econometrics with R*. Wiley. ISBN 978-1-1189-4918-4.

Other Texts:

Paul D. Allison (1984). *Event history analysis : regression for longitudinal event data*. Sage Publications: Thousand Oaks. ISBN: 0803920555

Janet M. Box-Steffensmeier and Bradford S. Jones (2005). *Event history modeling: A guide for social scientists*. Cambridge University Press: Cambridge. ISBN 0521546737

Erik Biørn (2017). *Econometrics of Panel Data: Methods and Applications*. Oxford University Press: Oxford. ISBN 9780198753445

Learning Objectives:

By the end of the course students will have:

- gained knowledge of statistical methods for panel data and event history methods.
- gained the ability to critically assess government and academic reports and research articles that employ such methods.
- learned the R commands to be able to estimate such models and perform various statistical tests with such models.
- be able to use these methods to conduct their own research.

Course Grading:

A student's grade will consist of their performance in three areas class participation, homework, and the group research project.

The relative breakdown of each of these areas in determining a student's overall grade is as follows.

- 10% Class Participation
 - Class participation includes attending class and actively participating in all discussions, activities, etc. during class
 - At the end of the semester, each student will write a brief summary of their participation activities during the semester.
- 30% Homework
 - Homework assignments must be turned in on the day that they are due. Late homework assignments will receive a 10% reduction.
- 20% Article Presentation
 - Each individual will make a 20-minute presentation of a research article that employs the statistical methods discussed in class. Articles can be chosen either from the reading list or, subject to approval by the instructor, elsewhere. More information about the research project will be given later in the semester.
- 40% Research Project
 - The research project is a semester-long project that will result in a research paper.
 - One-third of the grade is determined by a 30-minute presentation, while two-thirds of the grade is determined by an approximately 20-page paper.
 - The presentations will take place on the last day of class (December 4, 2023), and the final paper will be due December 11, 2023.
 - More information about the research project will be given later in the semester.

Software:

There are several statistical software programs, e.g., R, SAS, SPSS, and Stata. For this class, we will use R. R is a good software program for advanced statistical methods and its free!

canvas:

Much of the communications for this course will be through a canvas worksite. This site includes:

- An electronic form of the syllabus.
- Chat room for discussions on difficult topics.
- Homework and Other Assignments.
- Additional Reading Material and PowerPoint slides used in the lecture.
- Datasets.
- General Announcements.

Data Sets Used in Class:

In this class, many of the exercises in the homework as well as the group project will come from various data sets that are widely used in educational research.

Education Longitudinal Study of 2002 (ELS) conducted by the National Center for Education Statistics.

High School Longitudinal Study of 2009 (HSLs) conducted by the National Center for Education Statistic

National Longitudinal Survey of Youth 1997 (NLSY97) conducted by the Bureau of Labor Statistics.

Integrated Postsecondary Education Data System (IPEDS) conducted by the National Center for Education Statistics.

Panel Study of Income Dynamics (PSID) conducted by the Institute for Social Research (ISR).

British Household Panel Survey (BHPS) conducted by the ESRC UK Longitudinal Studies Centre with the Institute for Social and Economic Research at the University of Essex.

Please turn cell phones off before entering the class

If you feel you need an accommodation for any sort of disability, please make an appointment to see me during my office hours.

Course Topics

Review of Discrete Choice Models:

- Overview of Dichotomous Choice Models
- Maximum Likelihood Estimation
 - Logit/Probit Models
 - Estimating Logit/Probit Models with Stata
- Overview of Multinomial Choice Models
 - Multinomial Logit
 - Estimating Multinomial Logits with Stata

Panel Data Models:

- Working with and Preparing Panel Data
- Random Effects Linear Regression Models
- Fixed Effects Linear Regression Models
- Panel Data Models with Endogenous Regressors
- Dynamic Panel Data Models
- Panel Data Ordinal and Count Models
- Difference in Differences Estimation
- Event Study Models

Event History Analysis:

- Introduction to Event History Analysis
- Why do Event History Analysis
 - Terminology of Event History Analysis
- Single Spell Events
 - Continuous-time data
 - Parametric Methods
 - Adding Time-Constant Regressors
 - Non-parametric Methods
 - Cox regression
 - Adding Time-Varying Regressors
 - Models with Time-varying Coefficients
 - Models with Unobserved Heterogeneity
 - Specification tests

- Competing Risks Models
- Discrete-time data
 - Parametric Methods
 - Flexible Methods
 - Models with Unobserved Heterogeneity
 - Multiple Spell Duration Models with Fixed and Random Effects

Additional Readings on Panel Data

(*) Indicates papers I will discuss in class

Allen, D. & Wolniak G.C. (2019) "Exploring the effects of tuition increases on racial/ethnic diversity at public colleges and universities." *Research in Higher Education* 60(1): 18-43.

Andrabi, T., J. Das, et al. (2011). "Do value-added estimates add value? Accounting for learning dynamics." *American Economic Journal: Applied Economics* 3(3): 29-54.

(*) Bedard, K. & P. Kuhn (2008). "Where class size really matters: Class size and student ratings of instructor effectiveness." *Economics of Education Review* 27(3): 253-265.

Cellini, S. (2006). "Smoothing the transition to college? The effect of Tech-Prep programs on educational attainment." *Economics of Education Review* 25(4): 394-411.

Cheng, D. A. (2011). "Effects of class size on alternative educational outcomes across disciplines." *Economics of Education Review* 30(5): 980-990.

Clayton, A. B. & Umbach, P. D. (2020). "Making it Free and Easy: Exploring the Effects of North Carolina College Application Week on College Access." *Review of Higher Education*, 44(1): 87-119.

(*) Dariola, R. (2014). "Working (and studying) day and night: Heterogeneous effects of working on the academic performance of full-time and part-time students." *Economics of Education Review*, 38: 38-50.

Ehrenberg, R. G., G. H. Jakubson, et al. (2012). "Diversifying the faculty across gender lines: Do trustees and administrators matter?" *Economics of Education Review* 31(1): 9-18.

Ehrenberg, R. G. & Zhang, L. (2005). "Do tenured and tenure-track faculty matter?" *Journal of Human Resources* 40(3): 647-659.

Gorry, D. (2017). "The impact of grade ceilings on student grades and course evaluations: Evidence from a policy change." *Economics of Education Review* 56:133-140.

- Hillman, N.W. (2013). "Economic diversity in elite higher education: Do no-loan programs impact Pell enrollments?" *Journal of Higher Education* 84(6):806-833.
- Hinrichs, P. (2014). "Affirmative action bans and college graduation rates." *Economics of Education Review* 42: 43-52
- Hoffmann, F. & Oreopoulos, P. (2009). Professor qualities and student achievement." *Review of Economics and Statistics* 91(1): 83-92.
- Hurwitz, M. (2011). "The impact of legacy status on undergraduate admissions at elite colleges and universities." *Economics of Education Review* 30(3): 480-492.
- (* Jacobson, L., R. LaLonde, et al. (2005). "Estimating the returns to community college schooling for displaced workers." *Journal of Econometrics* 125(1-2): 271-304.
- Jaquette, O. (2019). "Do public universities replace state appropriations with Master's students?" *Review of Higher Education* 42(3): 1101-1144.
- Jaquette, O., & Curs, B. R. (2015). "Creating the out-of-state university: Do public universities increase nonresident freshman enrollment in response to declining state appropriations?" *Research in Higher Education*, 56(6), 535-565.
- Jepsen, C. & Montgomery, M. (2009). "Miles to go before I learn: The effect of travel distance on the mature person's choice of a community college." *Journal of Urban Economics* 65(1): 64-73.
- McCabe, D. L. & Trevino, L. K. (1997). "Individual and contextual influences on academic dishonesty: A multicampus investigation." *Research in Higher Education* 38(3): 379-396.
- McFarlin, I., Martorell, P. & McCall, B. P. (2020). "How much do public subsidies improve college attainment? Evidence from community college taxing district expansions." Working paper.
- Modena, F., Retorre, E. & Tanzi, G. M. (2020). "The Effect of Grants on University Dropout: Evidence from the Italian Case." *Journal of Human Capital*, 14(3): 343-370.
- Ness, E.C., & Tandberg, D.A. (2013). "The determinants of state spending on higher education: How capital project funding differs from general fund appropriations." *Journal of Higher Education* 84(3): 329-362
- Nutting, A. (2008). "Costs of attendance and the educational programs of first-time community college students." *Economics of Education Review* 27(4): 450-459.

- Rezende, M. (2010). "The effects of accountability on higher education." *Economics of Education Review* 29(5): 842-856.
- Sass, T. R., Semykina, A., & Harris, D. N. (2014). "Value-added models and the measurement of teacher productivity." *Economics of Education Review* 38: 9-23.
- Singell Jr, L. D. & J. A. Stone (2007). "For whom the Pell tolls: The response of university tuition to federal grants-in-aid." *Economics of Education Review* 26(3): 285-295.
- Singell Jr, L. D., Waddell, G.R. et al. (2006). "HOPE for Pell: Institutional effects in the intersection of merit-based and need-based aid." *Southern Economic Journal* 73(1): 79-99.
- Smith, J., Hurwitz, M., Howell, J. (2014). "Screening mechanisms and student responses in the college market." *Economics of Education Review* 44: 17-28.
- Toutkoushian, R. K. (2001). "Changes in the demand for public land-grant universities: The use of panel datasets." *Research in Higher Education* 42: 679-707.
- Turner, N. (2012). "Who benefits from student aid? The economic incidence of tax-based federal student aid." *Economics of Education Review* 31:463-481.
- Zhang, L. (2010). "The use of panel data models in higher education policy studies," J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research XXV*: 307-349.

Additional Readings on Event History Analysis

- Ampaw, F. D. & Jaeger (2012), A. J.. "Completing the three stages of doctoral education: An event history analysis." *Research in Higher Education* 53:640–660.
- Bahr, P. R. (2009). "Educational attainment as process: Using hierarchical discrete-time event history analysis to model rate of progress." *Research in Higher Education* 50(7): 691-714.
- Chen, R. (2012). "Institutional characteristics and college student dropout risks: A multilevel event history analysis." *Research in Higher Education* 53:487–505.
- Chen, R. & DesJardins, S. L. (2007). "Exploring the effects of financial aid on the gap in student dropout risks by income level." *Research in Higher Education* 49(1): 1-18.
- DesJardins, S. L. (2003). "Event history methods: Conceptual issues and an application to student departure from college." J.C. Smart (ed.), *Higher Education: Handbook of Theory and Research*, Vol. XVIII, 421–472

- DesJardins, S. L., D. A. Ahlburg, et al. (1999). "An event history model of student departure." *Economics of Education Review* 18: 375-390.
- (*) DesJardins, S. L., D. A. Ahlburg, et al. (2006). "The effects of interrupted enrollment on graduation from college: Racial, income, and ability differences." *Economics of Education Review* 25(6): 575-590.
- DesJardins, S. L., D. A. Ahlburg, et al. (2002). "A temporal investigation of factors related to timely degree completion." *Journal of Higher Education* 73(5): 555-581
- (*) DesJardins, S. L., D. A. Ahlburg, et al. (2002). "Simulating the longitudinal effects of changes in financial aid on student departure from college." *Journal of Human Resources* 37(3): 653-679.
- (*) DesJardins, S. L. & B. P. McCall (2010). "Simulating the effects of financial aid packages on college student stopout, reenrollment spells, and graduation Chances." *The Review of Higher Education* 33(4): 513-541.
- DesJardins, S. L., B. P. McCall, et al. (2002). "Adding a timing light to the 'toolbox'." *Research in Higher Education* 43(1): 83-114.
- Dowd, A. C. and Coury, T. (2006). "The effect of loans on the persistence and attainment of community college students." *Research in Higher Education* 47(1): 33-62.
- Doyle, W. R., M. K. McLendon, et al. (2010). "The adoption of prepaid tuition and savings plans in the American states: An event history analysis." *Research in Higher Education* 51(7): 659-686.
- Glocker, D. (2011). "The effect of student aid on the duration of study." *Economics of Education Review* 30(1): 177-190.
- Gross, J.P.K., Torres, V., & Zerquera, D. (2013). "Financial aid and attainment among students in a state with changing demographics." *Research in Higher Education* 54: 383-406.
- Hillman, N.W. & Orians, E. L. (2013). "Community colleges and labor market conditions: How does enrollment demand change relative to local unemployment rates?" *Research in Higher Education* 54:765-780.
- Ishitani, T. T. (2003). "A longitudinal approach to assessing attrition behavior among first-generation students: Time-varying effects of pre-college characteristics." *Research in Higher Education* 44(4): 433-449.
- Ishitani, T. T. (2008). "How do transfers survive after 'transfer shock'? A longitudinal study of transfer student departure at a four-year institution." *Research in Higher Education* 49(5): 403-419.

- Jaquette, O. (2013). "Why do colleges become universities? Mission drift and the enrollment economy." *Research in Higher Education* 54: 514-543.
- Johnson, I. (2008). "Enrollment, persistence and graduation of in-state students at a public research university: Does high school matter?" *Research in Higher Education* 49(8): 776-793.
- Johnson, I. Y. (2006). "Analysis of stopout behavior at a public research university: The multi-spell discrete-time approach." *Research in Higher Education* 47(8): 905-934.
- Jones-White, D. R., P. M. Radcliffe, et al. (2009). "Redefining student success: applying different multinomial regression techniques for the study of student graduation across institutions of higher education." *Research in Higher Education* 51(2): 154-174.
- Kienzl, G. S., M. Alfonso, et al. (2007). "The effect of local labor market conditions in the 1990s on the likelihood of community college students' persistence and attainment." *Research in Higher Education* 48(7): 751-774.
- Lassibille, G. R. & Navarro Gomez, M. L. (2010). "How long does it take to earn a higher education degree in Spain?" *Research in Higher Education* 52(1): 63-80.
- (*) Lesik, S. A. (2006). "Do developmental mathematics programs have a causal impact on student retention? An application of discrete-time survival and regression-discontinuity analysis." *Research in Higher Education* 48(5): 583-608.
- McCabe, D. L. & Trevino, L. K. (1997). "Individual and contextual influences on academic dishonesty: A multicampus investigation." *Research in Higher Education* 38(3): 379-396.
- Ortiz, E.A. & Dehon, C. (2013). "Roads to success in the Belgian French community's higher education system: Predictors of dropout and degree completion at the Universite' Libre de Bruxelles." *Research in Higher Education* 54: 693-723.
- Oseguera, L. & Rhee, B. S. (2009). "The influence of institutional retention climates on student persistence to degree completion: A multilevel approach." *Research in Higher Education* 50(6): 546-569.
- O'Toole, D. M., L. S. Stratton, et al. (2003). "A longitudinal analysis of the frequency of part-time enrollment and the persistence of students who enroll part-time." *Research in Higher Education* 44(5): 519-537.
- Singell, L. D. & Waddell, G. R. (2010). "Modeling retention at a large public university: Can at-risk students be identified early enough to treat?" *Research in Higher Education* 51(6): 546-572.

Stratton, L. S., D. M. O'Toole, et al. (2006). "Are the Factors Affecting Dropout Behavior Related to Initial Enrollment Intensity for College Undergraduates?" *Research in Higher Education* 48(4): 453-485.

Wang, X. (2009). "Baccalaureate attainment and college persistence of community college transfer students at four-year institutions." *Research in Higher Education* 50(6): 570-588.