SPS Seminar 1st term 2016-2017

Introduction to Quantitative Methods

Instructor: Moris Triventi, Research Fellow

Monday, 11:00-13:30, Seminar Room 2, Badia Fiesolana

Compulsory for all first-year researchers --- No registration required

(Contact: Monika.Rzemieniecka@eui.eu)

Introduction and Aim

The aim of this seminar is to provide researchers in sociology and political sciences practical knowledge of the application of basic quantitative techniques, which are commonly used in the social and political sciences, while using one of the major statistical software packages STATA. After beginning with a quick introduction to univariate and bivariate analysis, the seminar centers on the linear regression model. A correct understanding of its proper functioning and limitations is an essential precondition for venturing into more advanced techniques. The seminar also provides an introduction to applied logistic regression model.

In this seminar, therefore, you can expect to learn:

- How regression analysis can help you in answering your research questions
- How to estimate a multivariate linear regression model and interpret correctly its results
- How to estimate and correctly interpret interaction effects
- How to apply the main regression diagnostics tools
- How to estimate a logistic regression and interpret its results

Basic readings

- Berk, R. (2004). Regression Analysis: A Constructive Critique. Thousand Oaks, CA: Sage Publications.
- Bohrnstedt, G.W. & Knoke, D. (1994). Statistics for social data, Peacock Publishers.
- Treiman, D. (2009). Quantitative Data Analysis. Doing Research to Test Ideas, Jossey Bass.

The EUI library has a number of copies of these books on the seminar shelf.
Additional reading material will be provided during the seminar by the instructor.

Organisation

You should bring your laptop to the seminar because part of the teaching will consists of interactive examples using STATA in the class. An important complement to the lectures consists in making the exercises that are assigned each week. A special Dropbox folder will be created where you will find the weekly exercises and the materials used in class. The teacher assistants (TAs) will provide feedback on your exercises. The TAs for this seminar are Gordey Yastrebov

(Gordey.Yastrebov@eui.eu) and Giorgio Malet (Giorgio.Malet@eui.eu), both SPS researchers. They will also have office hours to provide assistance with STATA and with the making of the exercises (time and place tbc).

From the sixth class, the class will be divided in two groups. A first group (group A, "advanced") will go through the full program up to the logistic regression. A second group (group B, "beginners") will deepen basic knowledge with the TAs by focusing on additional practical exercises on data management, multiple regression, statistical inference and interactions in OLS regression (see the schedule below).

Credits

Complying with the attendance requirements and making all exercises is the condition for being awarded the seminar credits. These exercises have to be posted in a dedicated folder of the seminar Drop-box 24 hours before each session (thus before Sunday 11:00 am). You can team in groups of two for making the exercises. The last exercise consists of a small paper (4/5 pages plus tables) where you should carry out a multivariate analysis and interpret the results, using the skills you have learned through-out the seminar. For this final exercise participants are encouraged to use their own data (not necessarily the data one will use in his/her thesis). Researchers without applicable data have to contact us and the TAs in order to find proper data for this exercise.

If you want to write a term paper for this seminar/workshop, please send a copy by email to Moris Triventi (Moris.Triventi@eui.eu) as well as to the organizing administrative assistant (Monika.Rzemieniecka@eui.eu) by January 20th.

More details on seminar practicalities, deadlines and the final assignment will be given during the first introductory class. This course is obligatory for all SPS first year researchers.

Seminar schedule:

SESSION 1 (Oct 3th): Introduction and overview of seminar. The logic of quantitative secondary data analysis. Univariate analysis of qualitative and quantitative variables.

Readings:
Bohrnstedt & Knoke: Chapter 2;
Firebaugh, G. (2008). Seven Rules for Social Research, Princeton, NJ: Princeton University Press (Chapters 1).

SESSION 2 (Oct 10th): Bivariate analysis of qualitative and quantitative variables. How to make and comment properly a table. Introduction to bivariate plots and correlation analysis.

Readings:
Berk: Chapter 2;
Treiman: Chapter 1, 3

SESSION 3 (Oct 17th): Simple OLS regression models: model specification and interpretation.

Readings:
Schroeder, L. D., Sjoquist, D. L., & Stephan, P. E. (1986). *Understanding regression analysis: An introductory guide* (Vol. 57). Sage.

SESSION 4 (Oct 24th): Further discussion of the OLS regression and introduction to the basics of statistical inference.

Readings:
Schroeder, L. D., Sjoquist, D. L., & Stephan, P. E. (1986). *Understanding regression analysis: An introductory guide* (Vol. 57). Sage.
Freedman, D., Pisani, R. & Purves R. (2007), Statistics (4th ed.) (Chapters 16, 26 and 29)

SESSION 5 (Nov 7th): The use of statistical tests in applied research.

Readings:
Bohrnstedt & Knoke: Chapter 3
Berk: Chapter 4

Additional readings:
Bernardi, F., Chakhaia, L. and Leopold, L. (2015), "Sing Me a Song With Social Significance": The (mis)use of significance testing in European sociological research, Available at https://www.researchgate.net/profile/Fabrizio_Bernardi3/publication/295466769_Sing_Me_a_Song_With_Social_Significance_The_misuse_of_significance_testing_in_European_sociological_research_paper_under_review/links/56caa72308ae96cdd06e0a63.pdf.

SESSION 6 (Nov 14th): Multiple regression in practice. Model specifications to deal with spurious, intervening and conditional relationship.

Readings:
Berk: Chapter 7
Bohrnstedt & Knoke: Chapter 7, 8;
Treiman: Chapter 2, 7.

Additional readings:
Achen, C. H. (2005). Let's put garbage-can regressions and garbage-can probits where they belong. Conflict Management and Peace Science, 22(4), 327-339.
Schrodt, P. A. (2014). Seven deadly sins of contemporary quantitative political analysis. Journal of Peace Research, 51(2), 287-300.

GROUP A

SESSION 7 (Nov 21th): Interactions in OLS regression models. Meaning, estimation, and interpretation of interactions.

Readings:
Brambor, T., Clark, W. R., & Golder, M. (2006). Understanding interaction models: Improving empirical analyses. Political analysis, 14(1), 63-82.
Jaccard, J., & Turrisi, R. (Eds.). (2003). Interaction effects in multiple regression (Vol. 72). Sage.

Additional readings:
Hainmueller, J., Mummolo, J. & Xu, Y. (2016). How Much Should We Trust Estimates from Multiplicative Interaction Models? Simple Tools to Improve Empirical Practice. Available at SSRN: http://ssrn.com/abstract=2739221 or http://dx.doi.org/10.2139/ssrn.2739221.

SESSION 8 (Nov 28th): Introduction to generalized linear models; estimation and interpretation of logistic regression models. Some notes on mediation and moderation analysis in logistic regression models.

Readings:
Bohrnstedt & Knoke: Chapter 9
Long, S.J. (1997). Regression models for categorical and limited dependent variables. Sage (Chapter 3).

Additional readings:
Karaca-Mandic, P., Norton, E. C., & Dowd, B. (2012). Interaction terms in nonlinear models. Health services research, 47(1pt1), 255-274
Buis, M. L. (2010). Stata tip 87: Interpretation of interactions in non-linear models. The Stata Journal, 10(2), 305-308.
Mood, C. (2010). Logistic regression: Why we cannot do what we think we can do, and what we can do about it. European Sociological Review, 26(1), 67-82.
Karlson, K. B., Holm, A., & Breen, R. (2012). Comparing Regression Coefficients Between Same-sample Nested Models Using Logit and Probit A New Method. Sociological Methodology, 42(1), 286-313.

GROUP B

SESSION 7 (Nov 21th): Working examples on the topics addressed in the course (Seminar Room 3, Badia Fiesolana)

SESSION 8 (Nov 28th): Working examples on the topics addressed in the course (Seminar Room 3, Badia Fiesolana