Quantitative Methods in the Social Sciences I – Introduction into Regression Analysis

7.5 credits, Spring 2019

Syllabus

Last Updated: January 10, 2019

Instructors
Sven Drefahl (sven.drefahl@sociology.su.se)
Caroline Uggla (caroline.uggla@sociology.su.se)

Entry requirements
BA in social science

Course contents
This course deals with regression analysis in the social sciences. Regression analysis is a basic method in the social scientists' toolkit and its thorough understanding is a prerequisite for mastering other quantitative methods. This course is intended for students at the advanced (Master's and doctoral) level and requires basic knowledge of quantitative methods in the social sciences.

The objective of the course is to provide a thorough understanding of the uses of regression analysis in the social sciences. The course has an emphasis on understanding the uses, scope and limitations of regression analysis and of the relevance of its underlying assumptions, as well as on conducting regression analysis of social scientific research problems.

The course focuses primarily on Ordinary Least Squares (OLS) regression with continuous dependent variables, but also covers the analysis of binary dependent variables (including logistic regression). These methods will be approached through their two main purposes, namely the estimation of the effects of variables and the explanation of variance. The course starts with a discussion of binary regression analysis, followed by multiple regression, confounding, and indirect effects. Other topics covered include dummy variables and variable transformations, interactions, and outliers, heteroscedasctity, and multicollinearity.

Expected learning outcomes

After successfully completing the course, the students are expected to:

In terms of knowledge and understanding
- Understand the social scientific research problems regression analysis can be used to address, as well how regression analysis relates to more elementary quantitative methods.
- Have good knowledge of OLS regression and logistic regression and their statistical foundations.
- Understand the scope and limitations of OLS regression and logistic regression.

In terms of capabilities and competences
- Handle data and make the data transformations necessary in order to conduct a successful regression analysis that is suitable for the research problem at hand, using Stata.
- Independently conduct OLS and logistic regression analyses, and present and interpret the results from these analyses

In terms of critical approach
- Assess the conclusions and limitations of own and others' research results from regression analyses

In terms of preparedness for further study
- Be prepared to successfully complete further training in quantitative methodology in the Department of Sociology and elsewhere

Teaching and Course Organization
The course is offered at half-time over 10 weeks. Course participants and instructors meet approximately once a week for lectures, computer-based exercises and/or seminars using Stata. Course participants submit exercises and comment on peers' exercises in MONDO and/or during seminars.

Examination
The examination consists of active participation, individual assignments, and a take-home exam. The final grade is based on 17 dimensions (specified below), each of which is graded Good (2 points), Pass (1 point), and Fail (0 points).

Participation is based on the student's active participation in lectures and the computer labs (dimension 1), and the group work assignment (2).

Each of the 4 computer exercises is evaluated (3-6). 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 consists of two parts.
The first part consists of a critical evaluation of an assigned study. The following aspects are evaluated: (i) discussion of the appropriateness of regression analysis for the research problem addressed (7), (ii) assessment of the data, variables, and their

manipulation, and the model specification (8), and (iii) evaluation of the interpretation of the results and their potential limitations (9).

The second part consists of a small independent study using regression analysis. The following aspects are evaluated:

(i)   argumentation for why regression analysis is appropriate for the research question (10);

given the research question:

(ii)   data description, variable choice, and manipulation of the data and the variables (11.), and (iii) model specification (12.);

(iii)   assessment of outliers, functional form, heteroscedasticity, and interactions (13.),

(iv)   clear and appropriate presentation of the results of the regression analysis (14.),

(v)   interpretation of the results (15),

(vi)   discussion of results in light of the research question and the limitations of the analysis (16),

(vii)   Stata-syntax ("do-files") that are clear and easy to follow (17).

The total number of points a student can receive is 34. Exceptional performance in one or several of the above dimensions can be rewarded with up to 2 extra points.

The final course grade is based on the following criteria:

A (Excellent): 32-34 points
B (Very good): 28-31 points
C (Good): 25-27 points
D (Satisfactory): 21-24 points
E (Sufficient): 18-20 points
Fx (Insufficient): Fail one or two of the dimensions specified above
F (Fail): Fail more than two of the dimensions specified above

Students with grade Fx or F at an exam are entitled to take another exam as long as the course is provided in order to obtain grade E at least. A student with E or higher is not entitled to another examination to raise his/her grade. Students who received grade Fx or F on exams twice from the same examiner can request to be evaluated by another examiner. Such request should be sent to the Director of Studies.

Examination takes place during the course and there is a final exam at the end of the course. All course work must be submitted no later than one week after completion of the course to be examined during the current course. If a student fails to meet this deadline or leaves at least one task with significant errors that must be resubmitted, examination will take place in connection with the course being given the next semester or at the reexamination.

Plagiarism, cheating and unauthorized cooperation
It is the responsibility of the student to be familiar with the rules for examination. Detailed information is available at 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 verbatim copy a text (even a single sentence) without

indicating where this comes from. This also applies to texts you have previously written (self-plagiarism). Study groups are encouraged, but when it comes to individual course work, students must take care to submit independent work and not unauthorized cooperation.

Interim provisions
Students may request that examination according to this syllabus be completed up to three semesters after it expires. The request is to be directed to the Director of Studies. This regulation is valid for all assessed parts of the course.

Course literature

Course book:
Gordon, Rachel A. Regression Analysis for the Social Sciences. Routledge.
http://cw.routledge.com/textbooks/9780415991544/

Supporting literature:
Treiman, Donald. Quantitative Data Analysis: Doing Research to Test Ideas. Wiley.
Additional literature will be provided during the course.

Schedule: Quantitative Methods in the Social Sciences I – Introduction into Regression Analysis, 7.5 ECTS-credits, Spring 2019

Meeting	Date, Time, Room	Topic	Handout Exercise	Reading Course Book
1	01/23/19, Wednesday 09-11 in B389	Introduction		
2	01/23/19, Wednesday 11-13 in B389	Stata Introduction (optional, only for those who never used Stata)		
3	01/25/19, Friday 09-16 in B389	Correlations and Bivariate regression analysis		
4	01/29/19, Tuesday 09-16 in B389	Multiple regression: confounding and partial correlations	Yes	Chapter 5 & 6
	02/05/19, Tuesday 18:00	Deadline Assignment 1		
5	02/06/19, Wednesday 09-16 in B389	Multiple regression: intervening variables and explaining variance		Chapter 10
6	02/11/19, Monday 09-16 in B389	Variable transformations	Yes	Chapter 7 & 9
	02/18/19, Monday 18:00	Deadline Assignment 2		
7	02/19/19, Tuesday 09-12 in B389	Interactions 1		Chapter 8
8	02/20/19, Wednesday 13-16 in B389	Interactions 2	Yes	
	02/27/19, Wednesday 18:00	Deadline Assignment 3		
9	02/28/19, Thursday 09-16 in B389	Regression diagnostics		Chapter 11
	03/01/19, Friday 09:00	Handout Take Home Exam Part 1		
10	03/07/19, Thursday 09-16 in B389	Regression for binary outcome variables	Yes	
	03/12/19, Tuesday 18:00	Deadline Assignment 4		
11	03/13/19, Wednesday 09-14 in E487	Workshop		Chapter 12
	03/13/19, Wednesday 18:00	Handout Take Home Exam Part 2		
	03/25/19, Monday 18:00	Deadline Take Home Exam		