BARCELONA SCHOOL OF MANAGEMENT

MSc in Management

Marketing Research

Structural Equation Modelling

Professor: Albert Satorra

Course Type: Elective

Credits: 4 ECTS

Term: 2nd Term

Course Description

Structural equation modelling (SEM) is a versatile analytical framework for assessing models that describe statistical relationships among both measured and latent variables.

SEM includes multiple and multivariate regression, multiple indicator model, exploratory and confirmatory factor analysis, simultaneous equations, path analysis, and general structural equations.

The course will develop the basics and advances of the SEM methods to make the student equipped conceptually and computationally to do their own work with SEM as well as to be able to read SEM work critically.

Structural equation modelling (SEM) is a versatile analytical framework for estimating and assessing models that describe relationships among both measured and latent variables. SEM encompasses linear (simple, multiple, and multivariate) regression; exploratory and confirmatory factor models (models with multiple indicators of constructs, latent variables); multiple equation models with directional relationships among constructs (path analysis, structural equations); multiple-indicators multiple cause-models (MIMIC); models for longitudinal data; etc. In SEM the variables can be continuous and ordinal, and the data structure can be complex (multiple-group, multilevel, finite mixtures, presence of missing data, etc.). The course will develop the basics and advances of the SEM methods to make

the student equipped conceptually and computationally, so she/he be able to apply SEM on their own as well as to be able to read SEM work critically.

Objectives

The course is intended to give an introduction to the foundational concepts and basic computational techniques of structural equation modelling (SEM) and their implementation in a popular statistical software package, R, and other proprietary software (EQS in particular). The main goal is preparing the student to both using SEM in their work and to being able to evaluate its use in others' work critically.

Methodology

The course will develop general analytical and conceptual descriptions, examples with simulated and empirical data and class discussion, and the practice with SEM software, both in the free software R, and proprietary software. Passing the course requires each student to undertake a project with empirical data using the SEM method, the project culminating with a presentation and a final report.

Prerequisites:
SEM is a regression-based technique, so a two-semester sequence in introductory graduate statistics (or equivalent) is required.

Evaluation criteria

Assessment is composed of the following inputs:

1. Continual evaluation: class discussion + homeworks (20%)
2. Final Project (40%)
3. Final Exam (40%).

Failing to achieve the 50% of any of the three components, will require a retake composed by the Main project (40%) and a final exam (60%).

Final Project:

Because a primary goal of the class is to prepare the student on the use of SEM in her/his own work, a final project involving SEM is required, ideally using student's own data or with data of a secondary analysis (the data of a published work).

At the last week of the course, time will be allocated for a 10-minute conference-style presentation of each of the project, with discussion. The final project will be a written APA-style of "Method" and "Results and Discussion" (that should include both the statistical findings and some interpretations). The report should be about 4 typed pages (not counting appendices). Presentation and writing of the report should give the student the practice with (and feedback on) presenting the results of SEM models.

Reading Materials/ Bibliography/Resources

Kline, R. B. (2016). Principles and Practice of Structural Equation Modelling (4th edition). New York: Guilford Press.

Bollen, K. A. (1989). Structural equations with latent variables. New York: John Wiley & Sons.

Hoyle, R. H (Ed.) (2012). Handbook of structural equation modelling. New York: Guilford Press.

Material and technical support

Academic support for the course is provided via the web of the course that will be maintained by the instructor. The web of the course will list all recommended readings, presentations of lectures, replication code and data for empirical examples.

Bio of professor

http://www.econ.upf.edu/~satorra/