**Structural Equations Modeling with LIREL: Principles & Challenges**

**Dates:** 17-19 December 2019

**Times:** 09.00 – 17.30

**Venue:** Room 1.06, Maurice Keyworth Building

(Leeds University Business School)

**Seminar Objectives**

The purpose of this intensive seminar is to provide a user-friendly, in-depth introduction to (covariance-based) structural equations modeling (SEM) using the LISREL program and the SIMPLIS command language. The seminar’s emphasis is on understanding and applying SEM as a tool in substantive research and its target audience includes doctoral students and academic researchers involved in quantitative modeling and data analysis. **Important:** *The seminar assumes prior knowledge of data analysis and multivariate statistics (including factor analysis and regression).*

**Scope & Approach**

The seminar seeks to familiarize participants with the various stages associated with conceptualizing, identifying, estimating, and evaluating structural equation models, highlighting key decisions and potential problems at each stage. Following an introduction of SEM as an analytical approach, issues associated with the theoretical specification and graphical representation of a full latent variable model are discussed. These set the background for applying the LISREL program to estimate the model and assess its fit along different criteria. Strategies for model modification and cross-validation are also outlined. To enable participants experience SEM “in action”, the above issues are illustrated with a concrete example of a model estimated by the LISREL program. Detailed guidance for setting up and interpreting the relevant input/output files of the program is also provided.

Once course participants have become familiar with the basic principles of SEM and the use of the LISREL program, several different types of models will be illustrated, such as regression-type models, path analysis models, measurement models, and MIMIC models. In addition, various LISREL programming issues (e.g., fixing specific parameters, incorporating equality constraints, undertaking an effect decomposition) will be discussed as will problems that might be encountered.

The seminar will take the form of interactive workshop sessions, placing particular emphasis on student participation.

Participants are expected to download the (free) student version of the LISREL program from [www.ssicentral.com](http://www.ssicentral.com) and also read widely on the subject (see Course Text and Additional Readings below).

**Topics**

* Introduction to SEM
* Model Conceptualization I: Structure
* Model Conceptualization II: Measurement
* Path Diagram Construction
* Model Identification
* Introduction to the LISREL Program
* Parameter Estimation
* Model Fit Evaluation
* Model Modification
* Model Cross-Validation
* Examples of different types of SEM models

**Textbook:**

The main textbook used in the seminar is:

Diamantopoulos, A. & Siguaw, J.A. 2000. *Introducing LISREL,* Sage Publications (ISBN 0-7619-5171).

Students should also read the relevant chapters on SEM in:

Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. 2018. *Multivariate Data Analysis*, 8th edition, Pearson (ISBN  9781473756540).

**Additional Readings**

Anderson, J. C. & Gerbing, D. W. 1988. Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach. *Psychological Bulletin*, 103(3): 411-423.

Bagozzi, R. P. & Yi, Y. 1988. On the Evaluation of Structural Equation Models. *Journal of the Academy of Marketing Science*, 16(1): 74-94.

Bagozzi, R. P. & Yi, Y. 2012. Specification, Evaluation, and Interpretation of Structural Equation Models. *Journal of the Academy of Marketing Science*, 40(1): 8-34.

Baumgartner, H. & Homburg, C. 1996. Applications of Structural Equation Modeling in Marketing and Consumer Research. A Review. *International Journal of Research in Marketing,* 13(2): 139-161.

Chin, W. W., Peterson, R. A. & Brown, S. P. 2008. Structural Equation Modeling in Marketing: Some Practical Reminders, *Journal of Marketing Theory and Practice*, 16(4): 287-298.

Danes, J.E. & Mann, K.O. 1984. Unidimensional Measurement and Structural Equation Models with Latent Variables. *Journal of Business Research,* 12(3): 337-352.

Gefen, D., Straub, D. W. & Boudreau, M-C. 2000. Structural Equation Modeling and Regression: Guidelines for Research Practice. *Communications of the Association for Information Systems*, 4(1): 1-79.

Golob, T. F. 2003. Structural Equation Modeling for Travel Behavior Research. *Transportation Research Part B: Methodological*, 37(1): 1-25.

Iacobucci, D. 2009. Everything You Always Wanted to Know about SEM (Structural Equations Modeling) but were Afraid to Ask. *Journal of Consumer Psychology*, 19(4): 673-680.

Iacobucci, D. 2010. Structural Equations Modeling: Fit Indices, Sample Size, and Advanced Topics. *Journal of Consumer Psychology*, 20(1): 90-98.

MacCallum, R. C. & Austin, J. T. 2000. Applications of Structural Equation Modeling in Psychological Research. *Annual Review of Psychology*, 51(1): 201-226.

Mackenzie, S. B. 2001. Opportunities for Improving Consumer Research through Latent Variable Structural Equation Modeling. *Journal of Consumer Research*, 28(1): 159-166.

Reisinger, Y. & Turner, L. 1999. Structural Equation Modelling with LISREL: Application to Tourism. *Tourism Management*, 20(1): 71-88.

Schreiber, J. B., Stage, F. K., King, J., Vora, A. & Barlow, E. A. 2006. Reporting Structural Equation Modeling and Confirmatory Factor Analysis Results: A Review. *The Journal of Education Research*, 99(6): 323-338.

Shah, R. & Goldstein, S. M. 2006. Use of Structural Equation Models in Operations Management Research: Looking Back and Forward. *Journal of Operations Management*, 24(2): 148-169.

Shook, C. L., Ketchen, D. J., Hult., G. T. M & Kacmar, M. 2004. An Assessment of the Use of Structural Equation Modeling in Strategic Management Research. *Strategic Management Journal*, 25(4): 397-404.

Steenkamp, J. B. E. M. & Baumgartner, H. 2000. On the Use of Structural Equation Models for Marketing Modeling. *International Journal of Research in Marketing*, 17(2-3): 195-202.

Tomarken, A. J. & Waller, N. G. 2005. Structural Equation Modeling: Strengths, Limitations, and Misconceptions. *Annual Review of Clinical Psychology*, 1: 31-65.

Williams, L. J., Edwards, J. R. & Vandenberg, R. J. 2003. Recent Advances in Causal Modeling Methods for Organizational and Management Research. *Journal of Management*, 29(6): 903-936.

**Instructor**

Professor **Adamantios Diamantopoulos** BA MSc PhD DLitt holds the Chair of International Marketing at the University of Vienna, Austria.  He is also Visiting Professor at the University of Ljubljana, Slovenia and Senior Fellow at the Dr. Theo and Friedl Schoeller Research Center for Business & Society, Nuremburg, Germany. During the academic year 2012/13, he was the “*Joseph A. Schumpeter Fellow*” at Harvard University.

His main research interests are in international marketing and research methodology, and he is the author of over 200publications in these areas with more than 32,000 citations (Google Scholar, July 2019). His work has appeared, among others, in the *Journal ofMarketing Research*, *Journal of International Business Studies, Journal of the Academy ofMarketing Science, International Journal of Research in Marketing, Journal of Service Research, Journal of International* *Marketing, Journal of Retailing, MIS Quarterly, Organizational Research Methods, Psychological Methods, Information Systems Research, and Journal of Business Research.*

He has been the recipient of several Best Paper Awards, including the *2013 Hans B. Thorelli Award* for the article published in *Journal of International Marketing* that has made the most significant and long-term contribution to international marketing theory or practice. He sits on the Editorial Review Boards of a dozen academic journals, and acts as a referee for several professional associations and funding bodies. In 2000, he was elected Fellow of the *British Academy of Management* and in 2013 Fellow of the *European Marketing Academy*.

He is ranked #4 worldwide based on publications in the top six international business journals during 1995-2015. In2018, he was identified by *Clarivate Analytics* as one of the most cited researchers worldwide (top 1% across all disciplines) and in 2019 he was awarded the *JIBS Silver Medal.*

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**Programme (all three days)**

09.00 Coffee and registration

09.30 Seminar begins

11.00 Break

11.15 Seminar commences

13.00 Lunch

14.00 Seminar commences

15.30 Break

15.45 Seminar commences

17.30 Close

**Directions to the University of Leeds:**

The Maurice Keyworth Building (Leeds University Business School) is number 19 on the campus map (downloadable below).

<http://www.leeds.ac.uk/info/5000/about/131/find_us>

**To register your interest:**

Please complete all sections of the registration form below, making sure to include additional information (not exceeding 200 words) where requested.

You will receive notification if a place is allocated to you. Please do not make any travel arrangements until you have received confirmation of a place. We have a limited number of places available on NARTI training sessions and if at any time you need to withdraw your registration or cancel your place please inform us immediately so that we can offer the place to someone else. Please note that non-attendance is recorded and will have an impact on future selection.

It is expected that you participate for the full three-day duration of the seminar and allow sufficient time for travelling to the venue.

NARTI and the host institution will cover the full cost of the event and participants are asked to cover the cost of any travel and accommodation as required.

For further information about this seminar or any other NARTI training event, please contact Jo Garrick.

**REGISTRATION FORM**

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| --- | --- |
| **Name** |  |
| **University** |  |
| **Area of research** |  |
| **Level of study** | **□ Doctoral Student (please indicate your year of study)****□ Postdoctoral academic researcher** |
| **University e-mail address** |  |
| **Confirmation that you are available for all three seminar dates for the full duration of the programme.** |  |
| **Dietary requirements** |  |
| **Disability requirements** |  |
| **200 word summary of why you wish to participate in the seminar and previous knowledge and experience of data analysis, multivariate statistics and LISREL programme.****Please also list any courses you have attended in the above including dates, training provider and location.** |  |

Please return to Jo Garrick (narti@lubs.leeds.ac.uk) by no later than **Friday 8th November 2019.**