Partial Least Squares Structural Equations Modeling (PLS-SEM)  
Research Methods Workshop, pre-AIB-UKI conference @ Birkbeck, London 2016  

Monday 4 – Wednesday 6 April 2016  
Birkbeck, University of London  
Malet St, London WC1E 7HX  
Registration: https://de.amiando.com/april2016

Sponsors

1 Instructors

Prof. Dr. Christian M. Ringle  
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2 Course objectives

Partial least squares structural equation modeling (PLS-SEM) has recently received considerable attention in a variety of disciplines, including marketing (Hair et al. 2011, according to Google scholar the most-cited article ever published in JMTP; Hair et al. 2012a, according to Google scholar the most-cited JAMS article since 2012), strategic management (Hair et al. 2012a, according to Google scholar the most-cited LRP article since 2012), and management information systems (Ringle et al. 2012, according to Google scholar the second-most cited MIS Quarterly article since 2012).

The goal of PLS-SEM is the explanation of variances (prediction-oriented character of the methodology) rather than explaining covariances (theory testing via covariance-based SEM). The application of the PLS-SEM method is of particular interest if the premises of covariance-based SEM are violated and the assumed relations of cause-and-effect are not sufficiently explored. An additional advantage of the PLS-SEM method is the unrestricted incorporation
of latent variables in the path model that either draws on reflective or formative measurements models.

This three-day pre-conference workshop introduces participants to the state-of-the-art of PLS-SEM using the SmartPLS 3 software. The first day of the seminar provides a profound introduction to PLS-SEM. Participants will learn the foundations of PLS-SEM and how to apply it by means of the SmartPLS software. The instructors will make use of several examples and exercises. Starting at the second day and continuing on the third day, the seminar covers extensions and new developments to PLS-SEM.

3 Learning outcomes

This workshop is designed to familiarize with the potentials of using the multivariate analysis method PLS-SEM in international business research. The objectives of this course are to provide an in-depth methodological introduction into the PLS-SEM approach (the nature of causal modeling, analytical objectives, some statistics), (2) the evaluation of measurement results, and (3) complementary analytical techniques. More specifically, participants will understand the following topics:

- Model development and fundamentals of PLS-SEM
- Assessment and reporting of measurement and structural model results
- A new criterion for discriminant validity: The heterotrait-monotrait ratio of correlations (HTMT)
- Mediating effects
- Moderating effects (interaction effects)
- Multigroup analysis
- Measurement invariance testing
- Higher-order constructs (so-called second-order models)
- New segmentation tools, such as PLS-GAS and PLS-POS

This course has been designed for full-time faculty and PhD students who are interested in learning how to use the PLS-SEM method in their own research applications. A basic knowledge of multivariate statistics and SEM techniques is helpful, but not required.

4 Teaching and learning methods

- Presentations: The session will cover theory and its application.
- Computer exercises using the latest SmartPLS 3 version: Specifically, theoretical explanations underlying the software procedures and practical exercises where participants will apply their learning to real-world examples provided by the instructors.
5 Registration and practical issues

- Cost: A fee of £499.00 applies for this three-day seminar. The fee covers the participation in the seminar, handouts, and a 60-days license of SmartPLS 3 Professional.
- Places are limited (maximum of 40 participants).
- Food, drinks and subsistence not included in the registration fee.
- Course registration and payment: https://de.amiando.com/april2016
- Bring your laptop computer and a 2 or 3-way power extension lead.
- Download and install the SmartPLS software from http://www.smartpls.com/ before coming to the workshop (participants will receive detailed instructions shortly before the course starts); all participants will get a 60-days license of SmartPLS 3 Professional.

6 Teaching resources

The Book on PLS-SEM:

Journal Articles:

7 Schedule (4-6 April 2016, Monday-Wednesday, 9:30-17:30 daily)

- Location: Birkbeck, University of London
- Room: tba

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<tr>
<th>Date</th>
<th>Time</th>
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<tbody>
<tr>
<td>Monday 4 Apr 2016</td>
<td>09:00 - 10:30</td>
<td>Foundations of structural equation modeling and introduction to PLS-SEM</td>
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<tr>
<td></td>
<td>11:00 - 12:30</td>
<td>Model estimation and assessing measurement models; software tutorial</td>
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<td>14:00 - 15:30</td>
<td>Model estimation and assessing measurement models; software tutorial</td>
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<td>16:00 - 17:30</td>
<td>Assessing structural models; software tutorial</td>
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<td>Time</td>
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<td>09:00 - 10:30</td>
<td>Assessing structural models; software tutorial</td>
<td>Observed heterogeneity: multigroup analysis; software tutorial</td>
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<tr>
<td>11:00 - 12:30</td>
<td>Higher-order constructs; software tutorial</td>
<td>Measurement model invariance; software tutorial</td>
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<td>14:00 - 15:30</td>
<td>Mediation; software tutorial</td>
<td>Unobserved heterogeneity: FIMIX-PLS and PLS-POS</td>
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<tr>
<td>16:00 - 17:30</td>
<td>Moderation; software tutorial</td>
<td>Unobserved heterogeneity: FIMIX-PLS and PLS-POS</td>
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## 8 Instructor’s short bio

**Christian M. Ringle** is a Professor of Management and the Director of the Institute for Human Resource Management and Organizations at the Hamburg University of Technology (TUHH) and Visiting Professor at the Faculty of Business, and Law Professor at the University of Newcastle (Australia). His research has been published in well-known journals such as *Information Systems Research (ISR)*, *International Journal of Research in Marketing (IJRM)*, *Journal of Business Research (JBR)*, *Journal of Service Research (JSR)*, *Journal of the Academy of Marketing Science (JAMS)*, *Long Range Planning (LRP)*, *MIS Quarterly (MISQ)*, and *Organizational Research Methods (ORM)*. Dr. Ringle co-authored the textbook on PLS-SEM and is co-founder of SmartPLS, a software tool with a graphical user interface for the application of the PLS-SEM method. More information: [http://www.tuhh.de/hrmo/team/prof-dr-c-m-ringle.html](http://www.tuhh.de/hrmo/team/prof-dr-c-m-ringle.html).

**Marko Sarstedt** is a Professor of Marketing at the Otto-von-Guericke-University Magdeburg (Germany) and Adjunct Professor at the Faculty of Business and Law of the University of Newcastle (Australia). His main research interest is in the advancement of research methods to further the understanding of consumer behavior. His research has been published in journals such as *Journal of Marketing Research*, *Journal of the Academy of Marketing Science*, *International Journal of Research in Marketing*, *MIS Quarterly*, *Organizational Research Methods*, *Journal of Business Research*, *Journal of Marketing Theory & Practice*, *Journal of World Business*, and *Long Range Planning*. Dr. Sarstedt has co-edited several special issues of leading journals and co-authored the textbook on PLS-SEM. More information: [http://www.marketing.ovgu.de](http://www.marketing.ovgu.de).

**Jan-Michael Becker** is a postdoctoral researcher and lecturer in Marketing at the University of Cologne in Germany. He has been a visiting scholar at leading international business schools like Georgia State University, Atlanta, USA and University of Waikato, Hamilton, New Zealand. His research interests focus on structural equation modeling (SEM), PLS path modeling, unobserved heterogeneity, and measurement theory, as well as bridging marketing and IS problems. His research has been published in several premier academic journals, including *Information Systems Research*, *MIS Quarterly*, *Long Range Planning*, and *Marketing Letters*. He is a co-developer of the SmartPLS software application. More information: [http://www.voelckner.uni-koeln.de/de/team/team/dr-jan-michael-becker/](http://www.voelckner.uni-koeln.de/de/team/team/dr-jan-michael-becker/)
Structural Equation Modeling (SEM) is a second-generation multivariate data analysis method that is often used in marketing research because it can test theoretically supported linear and additive causal models (Chin, 1996; Haenlein & Kaplan, 2004; Statsoft, 2013). With SEM, marketers can visually examine the relationships that exist among variables of interest in order to prioritize resources to better serve their customers. The second approach is Partial Least Squares (PLS), which focuses on the analysis of variance and can be carried out using PLS-Graph, VisualPLS, SmartPLS, and WarpPLS. It can also be employed using the PLS module in the statistical software package. Partial Least Square(PLS) Regression using SPSS with Graphical Output. Overview. PLS-PM is a component-based estimation approach that differs from the covariance-based structural equation modeling. Unlike covariance-based approaches to structural equation modeling, PLS-PM does not fit a common factor model to the data, it rather fits a composite model; In doing so, it maximizes the amount of variance explained (though what this means from a statistical point of view is unclear and PLS users do not agree on how this goal might be achieved). In addition, by an adjustment Partial Least Squares Structural Equation Modeling (PLS-SEM) Techniques. Using SmartPLS, Ken Kwong-Kay Wong. SmartPLS is one of the prominent software applications for Partial Least Squares Structural Equation Modeling (PLS-SEM). It was developed by Ringle, Wende & Will (2005). The software has gained popularity since its launch in 2005 not only because it is freely available to academics and researchers, but also because it has a friendly user interface and advanced reporting features. Structural Equation Modeling (SEM) is a second-generation multivariate data analysis method that is often used in marketing research because it can test theoretically supported. linear and additive causal models (Chin, 1996; Haenlein & Kaplan, 2004; Statsoft, 2013).