Course and literature guide EHFE006, Quantitative Methods, 7.5 Credits

This guide aims at making it easier for teachers and students to follow the structure of the course and what to prepare. This is however the first time we offer this course, so you need to keep track of extra information that might be added in order for everything to go as smooth as possible.

The course is based on 8 different subjects/lectures containing three different parts or tasks.

The subjects are chosen because we perceive that these are the most common areas that needs to be addressed in order to understand and hopefully motivate you to read and publish quantitative articles in the most influential journals. We have tried to incorporate researchers from all areas but today the researchers are found at within the marketing areas.

The 8 different subjects are:

- Introduction to quantitative research (data collection/online data/validity/reliability)
  - Hair et al Chapter 1
  - Hair et al Chapter 2

- Problematisation (causality/hypothesis development and testing)
  - Distel (2017)
  - Barney’ Foss & Lyngsie (2018)

- Regression part 1 (ANOVA, t-test, Big data)
  - Hair et al Chapter 4
  - Hair et al Chapter 6
  - Johan Jansson (2017)

- Regression part 2, (Simple, logistic, Multiple)
  - Hair et al Chapter 7
  - Johan Jansson (2010)

- Experiments (Big data, Latin Square, etc)
  - Nordfält (20xx)
  - Nordfält (20xx)

- Factor analysis (Alpha test, etc)
  - Hair et al Chapter 3
  - Parasuraman et al (1988)
- Econometrics (Panel data and endogeneity, Econometrics etc.)
  - Antonakis, Bendahan, Jacquot & Lalive (2014)
  - Brooks (2008), Chapter 1
  - Brooks (2008), Chapter 10

- Structural Equation Modelling Part 1 (SEM, CFA, etc)
  - Hair et al Chapter 12
  - Hair et al Chapter 13

- Structural Equation Modelling Part 2 (SEM, Prediction)
  - Hair et al Chapter 14
  - Anselmsson, Burt, & Tunca (2017).

- Seminar (Review of master thesis and self-reflective report)

The course is a mix of lectures, discussions, seminars and hand ins on tasks that you do on your own or in pairs. The course ends up in a seminar at the last day of the course.

Each time is based on one 45 min seminar, 2×45 minutes lectures plus 45 minutes where you can work on your group (pair) assignment.

- we always (exception of the first) start with 45-minute seminar where two students present their solutions and reflections on the weeks task.
- The lectures a representation of the main ideas about a certain method using the course literature. Besides the course book Hair et al.). The lectures own research and probably one or two articles that is provided after or before the lecture. Also, some technical issues are needed to be presented in order to cope with the home task.

The home assignments are supposed to be performed by the use of SPSS software and other suggested alternatives. As a result, you need to install a program version before the course starts. For the Structural Equation Modeling part of the course the free statistical software “R” will be used. More information about installation of this software will be provided by the lecturer.

You will receive data material for each home task that you can do individually or in groups of two. The data will either be delivered by the teacher or based on the files that comes with the course book and the course material. If you work in pairs it is important that both persons are involved in each exercise and during the seminar both students must present and answer questions about the results. You will never know which group and what person from each group that needs to present.

You should be able to present the results and what everything in the output means as well as the conclusions you could draw from the exercise. There are also some additional questions provided together with the data that you get from the teacher (in the end of their lecture at latest) that you should be able to answer when performing your home task. At least one hour before the seminar you should submit the paper to johan.anselmsson@fek.lu.se. The report is done in Word where you paste the SPSS outputs.

**Examination**
All tasks should be submitted in Word format to johan.anselmsson@fek.lu.se at least one hour before each related seminar. Name the e-mail and word file according to the task and your e-mail address: Home task Factor analysis xx@fek.lu.se, Master thesis grade and feedback xx@fek.lu.se, Reviewer feedback xx@fek.lu.se, Self-reflection report xx@fek.lu.se.
Home task: Will be assessed by the teachers responsible for each subject. You could paste your slides as well or mail them in a separate document. The report should demonstrate that you have understood everything that can be found in an SPSS output or according to the instructions of the teacher. Hair is a very good help and when possible, you should refer to Hair et al. For SPSS demonstration there are demonstration videos online and we have received login from Creon who provides SPSS service.

Master thesis grade and feedback (A thesis will be provided): The master thesis feedback should be of maximum 2 pages and have an even balance between the chapters of the paper but a focus on the statistical approach and conclusions drawn from the statistical results. We do not know if the thesis in the condition you received is a pass or not.

Reviewer feedback on submitted article (There will be two articles to choose from): The feedback should be of maximum 2 pages and have an even balance between traditional review themes but focus on the statistical approach and conclusions drawn from the statistical results.

Self-reflection report: Should be personal and contain maximum 2 000 words. Individual reflection diary on the learning process with respect to statistical thinking relevance for my own research area and project.

For each of the lectures/subjects you will get the following information in the beginning of the lectures one week before the subject will be treated. Here is an example of the info you will get the week before you treat the Principal Component Analysis.

Example: November 19, 12.15–16.00, Factor analysis, Alpha test and some more, Johan Anselmsson, Alfa: 3071

Literature:
- Hair et al Chapter 3
- Parasuraman et al (1988)

Online tips:
http://statwiki.kolobkreations.com/index.php?title=Exploratory_Factor_Analysis
There is one YouTube link, but look at two others and then you will get an understanding of what is common issues and the common way to do it. But remember, in your reports you should refer to Hair et al in subjective issues like threshold values and sample size.

Home task:
Data source: HBAT_200.sav – an expanded dataset, comparable to HBAT except for 200 provided by Hair et al.

I want you to develop the best possible factor structure based on PCA and a rotated model.

Present your final model and the overall conclusions a researcher as well as a manager could make out of this.

Name the factors, sort items by factor loading and suppress values below .25
If we have x items in the model – how many observations do we need?
What could a low KMO mean – (Too few observations)
What could a low sig in Bartlet’s test mean? (Little correlation between items)
What are the benefits and draw backs with working with PCA?
Is the overall validity of your model okay? Motivate
Is the communality in your model okay? Motivate
What does cumulative variance explained and how does your value relate to the threshold values presented in Hair et al?
Is the contribution of the different factors in your model even and why/why not?
Is there a relationship between eigenvalue and the number of factors in your model? Why/why not?
Present the essentials of your rotated model in a nice single table that could be okay for a publication
By default, the extraction method is Principal Component Analysis, but there is a point of using Maximum Likelihood Extraction in some cases, which one?

Save the factor scores and run in a multiple regression model with factor one as dependent variable and the other ones as independent. Is the model significant and relevant? Why/Why not?
What do the factor loadings describe?
What does cross loading mean and how can you/ did you handle that?
Did you have any problem with the component transformation matrix? What could such problems be and indicate.
Please validate your structure by using Cronbach’s Alpha test under analyse Scale – Scale reliability analysis Use between 2–5 items per factor. Decide for the best solution for each factor. Motivate your solution and how does this solution comply to the threshold values in Hair et al.
Please paste all outputs related to your final solutions in an appendix.
You should also present a correlation matrix describing all items in your final model. Are there any interesting conclusions to make from this?

Book

Articles


Jens Nordfält – tba
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