

Latent variable models for Sustainable Finance

§ Name of instructor

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§ Short description

The course introduces the basics of Item Response Theory (IRT), focusing on model-based theories, binary item models (Rasch, 2PL, 3PL), polytomous item models (Graded Response, Partial Credit, Rating Scale), the Rasch paradigm, estimation methods, statistical tools for model and item selection, differential item functioning.

The lessons combine theoretical topics with practical examples using R software.

§ Schedule

1. Item Response Theory (IRT) – Introduction
2. IRT models for binary items (Rasch model, 2PL model, and 3PL model): meaning of ability, basic assumptions, models parameterisation, interpretation of item parameters
3. Model selection: the Item Characteristic Curve, Person-Item map, Item information, Differential item functioning
4. IRT models for polytomously-scored items (graded response model, partial credit model, rating scale model)
1. The course applies these concepts to - Measurement of ESG attitudes and sustainability preferences; - Construction and validation of latent sustainability indicators; - Assessment of sustainable investment behaviour using questionnaire data

§ Introductory background

- Tutz, G. (2025). *A short guide to item response theory models*. Springer.

§ Facilities Required

- Software: R, open source, with the R packages ltm, mirt, eRm, installed
- Course Material. All course materials, including the data and R scripts for the examples, will be made available for course participants.