

The RM Basic Principles

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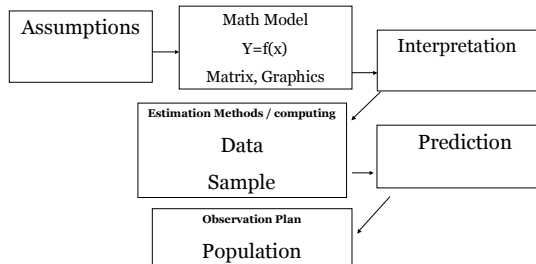
NOTE

- Basic principles presented in this PPT are developed by the RM Institute and are copyrighted. They have been used in most of the training programs offered by this institute, and in most of the RM software systems.

Summary

- The three key components of our RM principles are the RM4Es, stepwise process approach and strategy-technique separation.

The Basics 1: Assumptions as the base of our Quantitative Research Logic



The Basics 2: Research Purposes as the Starting Point

- Research purposes are where to start!
- Purpose type 1: Explanation
- Purpose type 2: Prediction
- Different purposes lead to different research processes
- and determine the combination of strategies with techniques

The Basics 3: All the Research Elements are needed

- Research Questions / Research Purposes
- Model
- Data
- Estimation Method
- Results (fit, errors, ...)
- People often confuse estimation with model.
- How these elements consistent with each other determines the goodness of a research method.

The RM Principle 1: the RM4Es

- The RM 4 Es
- Equation
- Estimation
- Errors (Evaluation of Models)
- Explanation

- The RM4Es is sufficient to summarize a research status.

The RM Principle 2: Strategies vs. techniques

- Research strategies
- (match research question with methods, match data with models, match model with estimation methods, when to stop, what is good)
- Research techniques
- (estimation methods, functional transformation, indices, statistical tests)
- A good research method is a good combination of statistical techniques, statistical strategies and subject knowledge.

The RM Principle 3: Research is a search process

- A research is:
- a process of searching for the best model.
- a repetitive, cyclical search process.

- Results from previous analysis will be used for model diagnostics and for decision-making on where to go.
- This search process can be summarized by a research map.

Research Process Examples

- Confirmatory
- Data -> Model Estimation -> Model Fit
- -> Confirm or Reject
- Exploratory
- Data -> Model -> New Model -> Final Model

Step by Step Process example 1: regression modeling

- 7-step approach of building regression models
- Step 1: Graphically Explore & OLS to Estimate the Initial Model
- Step 2: Check ALL the Assumptions to Find Problems
- Step 3: Take Care of Outliers & Treat Collinearity and Dummy Variables
- Step 4: Use Variable Transformation to Correct ALL the Problems Detected
- Step 5: Select a best set of your variables
- Step 6: Final Diagnostics to Ensure your model is GOOD Enough
- Step 7: Estimate All the Coefficients & Present Your Results

Step by Step Process example 2: SEM

- Step 1: prepare the data
- Step 2: specify the model
- Step 3: estimate the model
- Step 4: examine the fits
- Step 5: conduct diagnostics
- Step 6: interpret the results

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