Session 25 WS

Maximizing Information From Minimum Number of Scenarios

How Many Scenarios do I need?

Answer: It depends on:

- What you want to measure in the Line of Business
  - Price vs. Cash Flow Testing
- Overall fit of distribution
- Extremes of distribution
- It would be nice to get everything

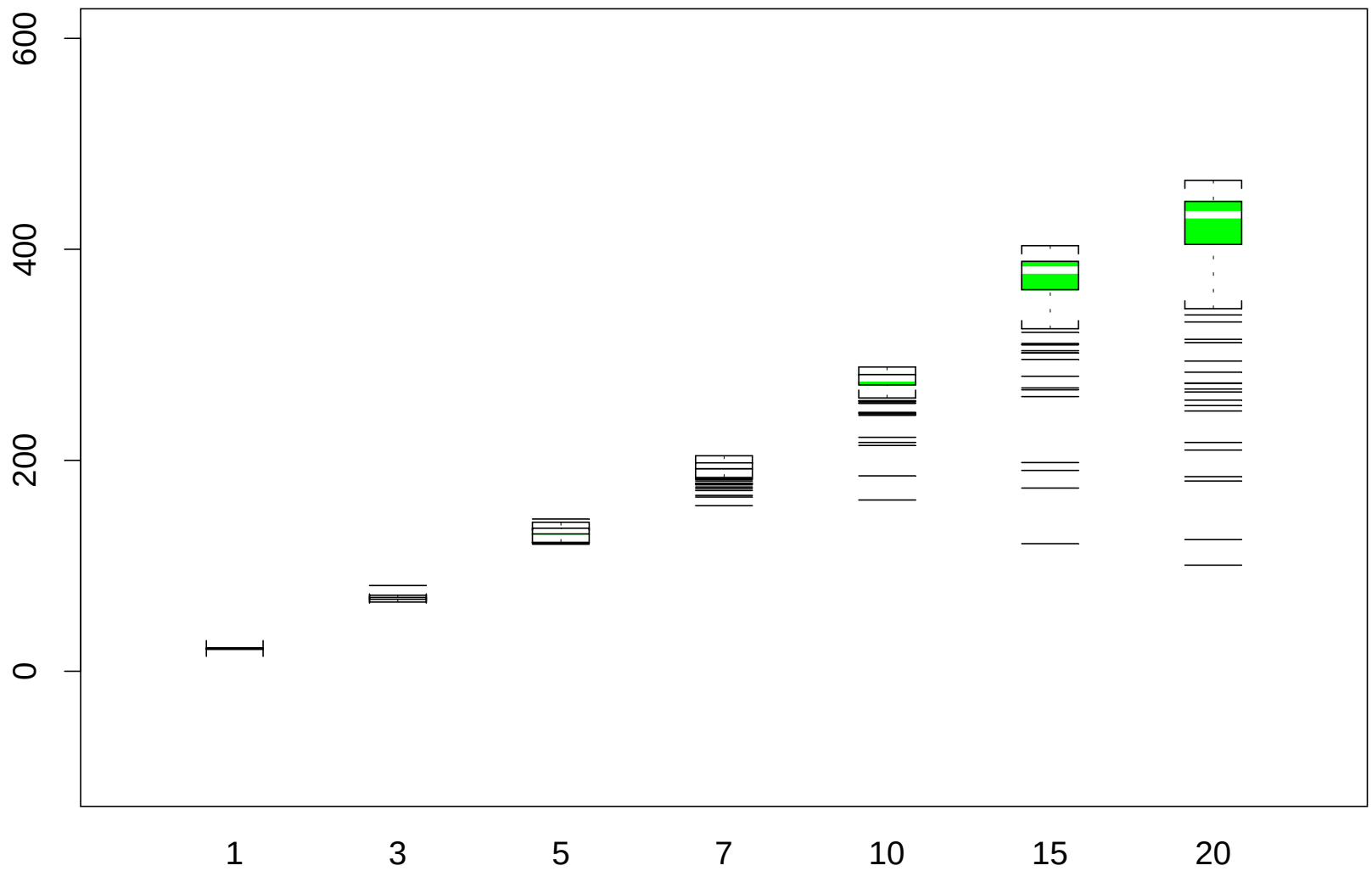
Methods of attack

0. Deterministic Scenarios

- How many?
- How do we design them?
- Is there a Black Hole Scenario?

1. Monte Carlo

- How do we generate?
  - Realistic


Public FOD
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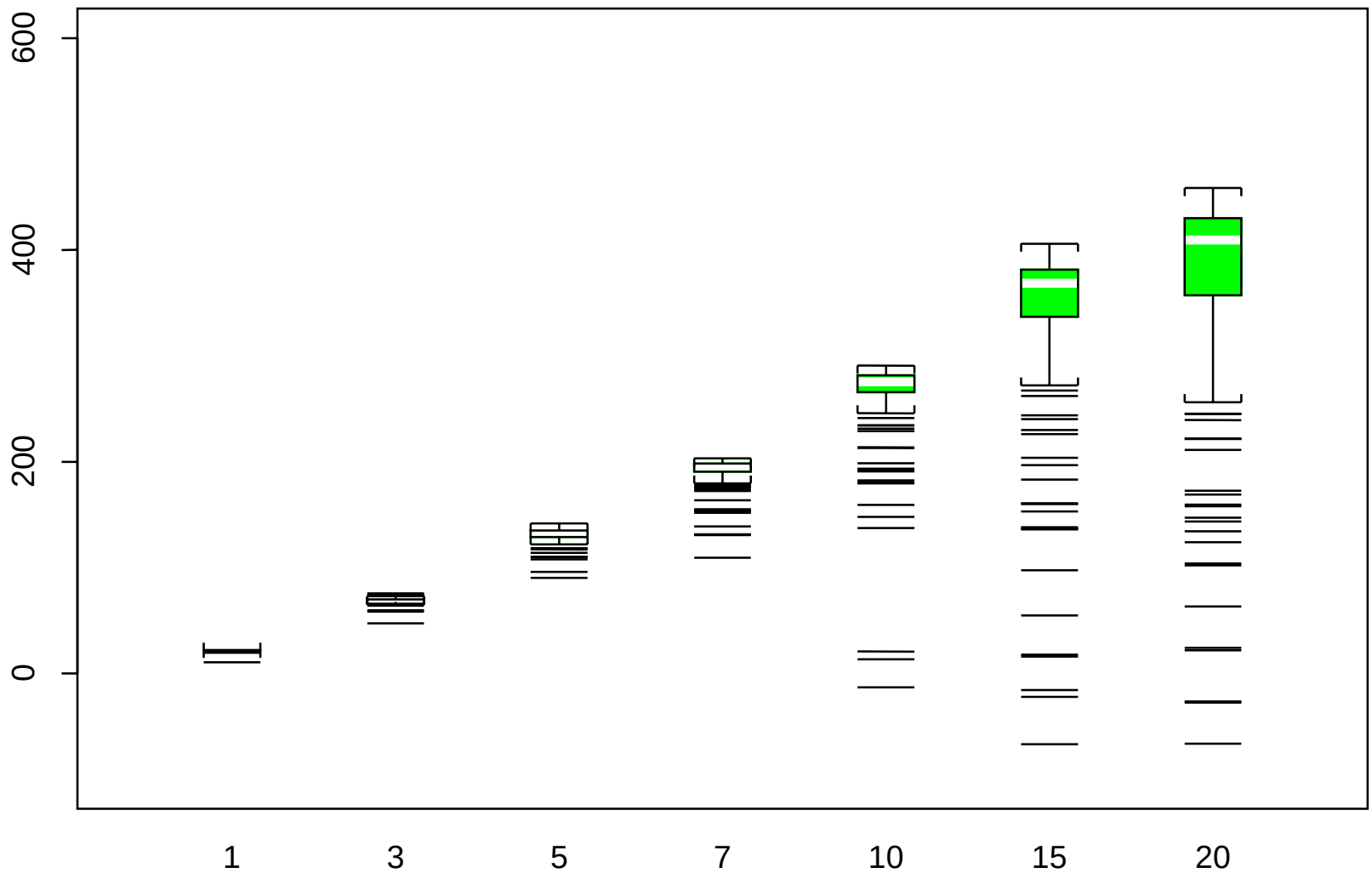
Log-Normal Model


Public FOD
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Tenney Model

1. Monte Carlo, Continued

- How many?
  - Nonparametric Program - Order2
    - See Appendix I in my ARCH paper

2. Fitting parametric models

- Generalized Type II Beta Distribution
- Extreme Value Distributions

2. Fitting parametric models, Continued

- Problems
  - How do you know which one to use?
  - Sample till certain moments stabilize.
  - Does not model the entire range of possibilities well.

3. Low Discrepancy Sequences

- Quasi-random numbers
  - Minimizes clustering and gaps
  - Does automatic experimental design
  - Number of scenarios related to dimension of scenario file

3. Low Discrepancy Sequences, Continued

- Problems-
  - Public domain algorithms
    - Dimensional break down
    - Non linear models
  - Expensive proprietary algorithms
  - www.sequences.com

4. Resampling and Extreme Value Statistics

- Determine type of tail.
- Model extreme tails- REV method
  - How effective is REV vs. fitting parametric model
  - Necromancy

5. Representative Scenarios

- Representative Scenarios
  - Sarah Christiansen
  - John Manistre

5. Representative Scenarios, Continued

- Representative Scenarios
  - Tom Ho - Linear Path Space
  - Pro:
    - Pricing
  - Con:
    - CFT
    - Only works with Single factor model

6. Credibility

7. Quantile Regression

- Connects scenario attributes to the extreme surplus distribution
- Future Research

Maximizing Information From Minimum Number of Scenarios

- Deterministic Scenarios
- Monte Carlo
  - Psuedo Random
  - Low Discrepancy
- Representative
- Distribution fitting
- Resampling
- Credibility
- Quantile Regression