

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

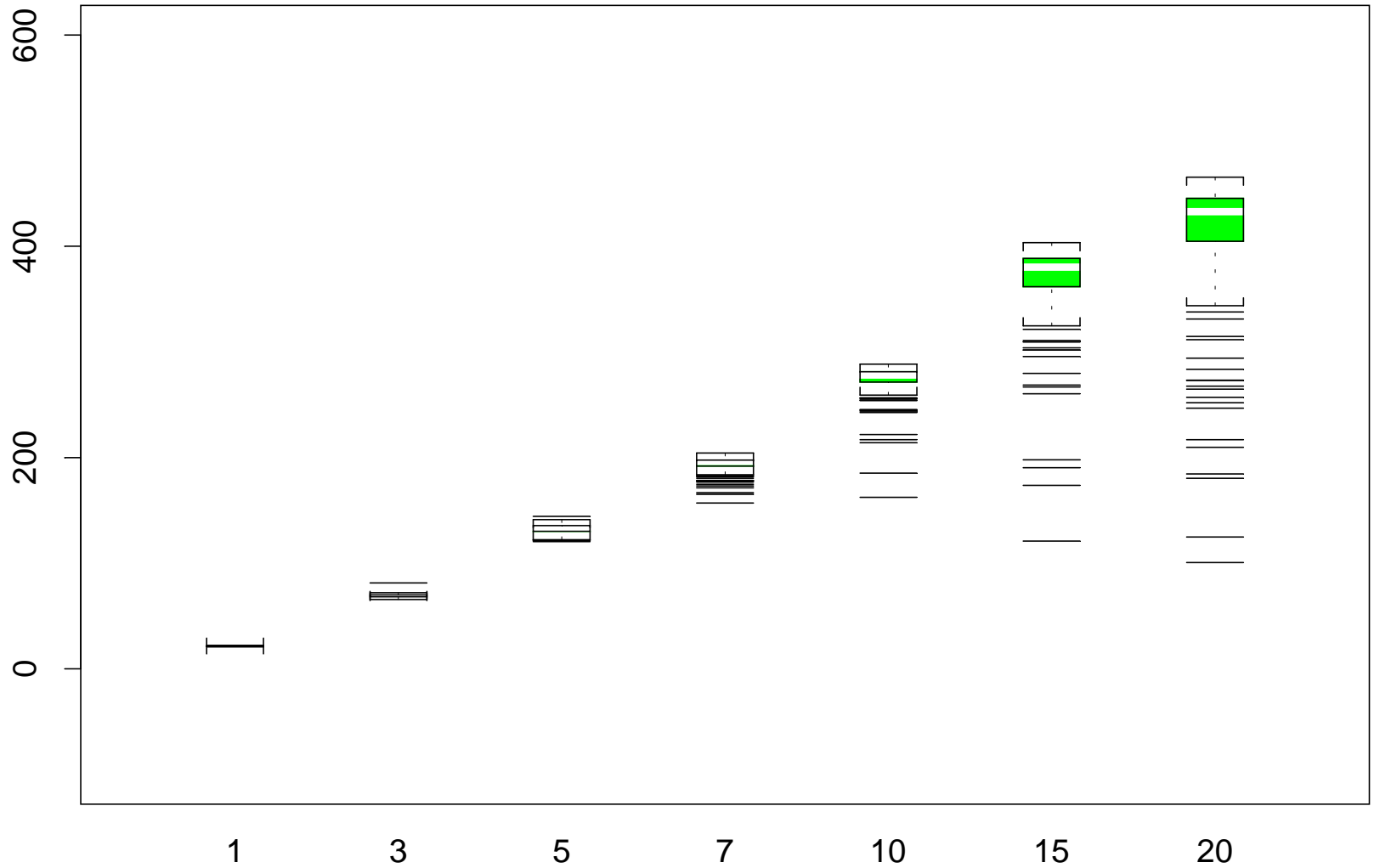
0. Deterministic Scenarios

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

1. Monte Carlo

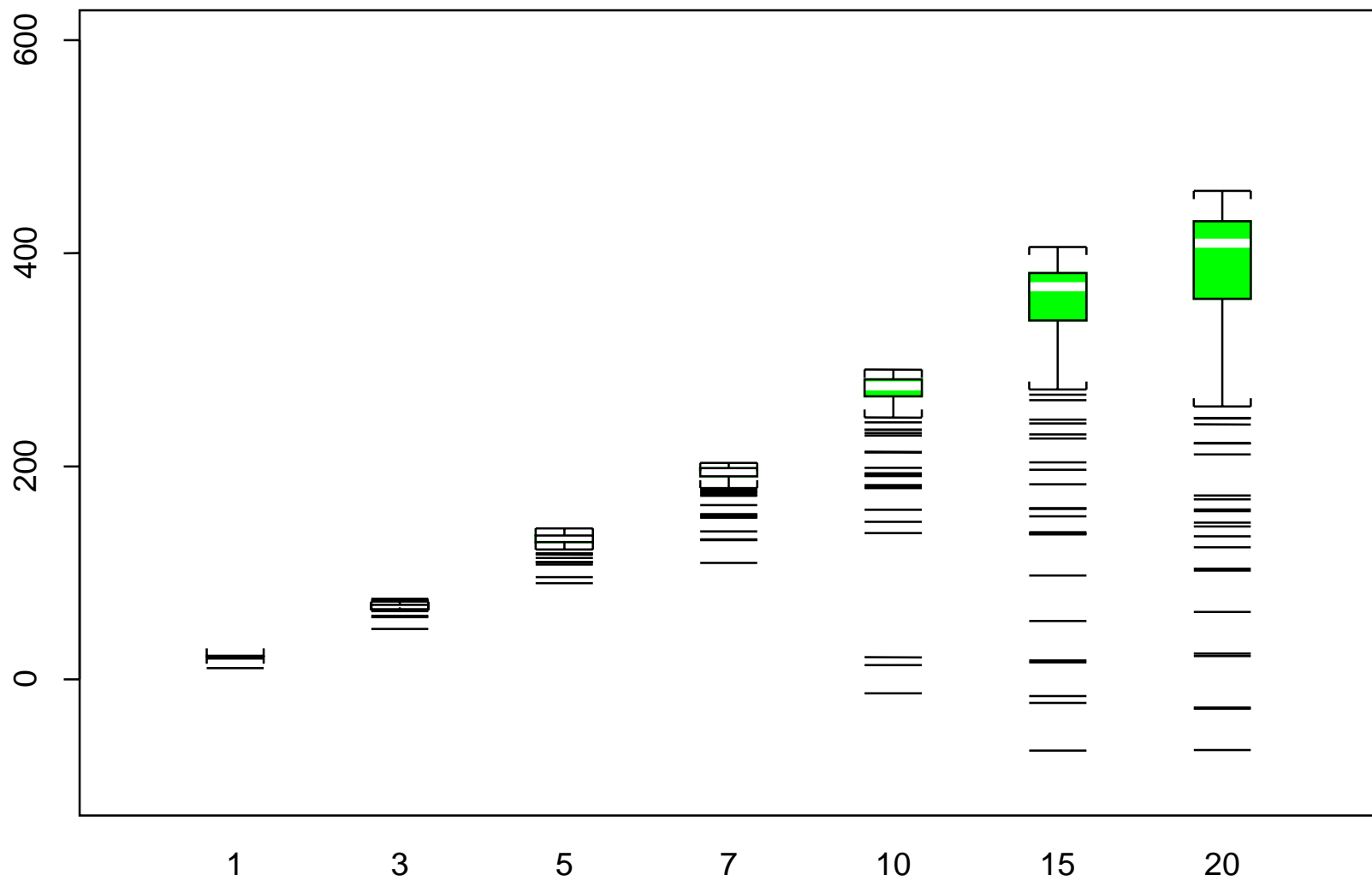
- How do we generate?
 - Realistic

Public FOD



Log-Normal Model

Public FOD



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

Maximizing Information From the Minimum Number of Scenarios for ALM

- Monte Carlo
 - Psuedo Random
 - Low Discrepancy
 - Examples
- Representative
- Distribution fitting
- Resampling
- Quantile Regression