

Ruin probabilities in property insurance

Background

Assessing ruin probabilities is a classical theme in actuarial science. These should be seen as criteria for determining the capital that is sufficient several years ahead, even under adverse circumstances. The traditional method for solving the ruin problem is the Cramér-Lundberg theory via upper bounds, but Monte Carlo is arguably a better approach today.

Objective:

Present the Monte Carlo method and Cramér-Lundberg bounds for solving the ruin problem and compare them.

Material:

Section 6 from Chapter 3: “Evaluating risk: A primer” and Sections 2, 5 and 6 from Chapter 11: “Liabilities over long”.

Main points:

The presentation (45 minutes) should cover

- the Cramér-Lundberg theory
- Monte Carlo solutions to the ruin equation
- A discussion of the weak and strong points of these approaches and which situations they cover
- Numerical comparisons:
 - Find a suitable model and parameters
 - Compare the two approaches for the situation without financial earnings
 - Compare the Monte Carlo solutions for the situation with and without financial earnings.