Till Stowasser

Economic Foundations and Applications of Risk, 2026

Exercises for Foundations of Risk (Chapters 1–3)

1. **States of the world**
   Consider a risk-averse farmer confronted with two possible states of the world: Good weather (G) and bad weather (B). Let the yield of his cornfield be 10 in state G and 2 in state B.

   (a) Depict this situation in a "States of the World" diagram.

   (b) Find the farmer's certainty equivalent in the diagram.

   (c) Assume that the farmer can trade state-dependent income: For one unit in state G, q units will be paid in state B (q can be larger or smaller than one). Draw the corresponding budget line into the diagram.

   (d) Denote the amount of traded income with T. Assume that the farmer trades exactly as much state-dependent income as to get a certain income, irrespective of the weather. How will T depend on G, B, and q in this case?

   (e) Is the situation described in (d) optimal?

2. **Risk comparisons: Diversification**
   Let A possess a financial asset, worth 100 MU and additionally a house with a value of 80 MU. The probability of a fire that would destroy the house, which is not insured, is 10%. Let B own the same financial asset as A and 2 houses, worth 40 MU each. The probability of a fire for each of the two houses is also 10%, and the fires are assumed to be stochastically independent of each other.

   (a) Calculate the respective expected values of final wealth for A and B.

   (b) Draw the distribution functions of final wealth for A and B.

   (c) By using the risk comparisons from the lecture, demonstrate that A has the more risky housing portfolio than B.

3. **Risk comparisons: Motivational example from Chapter 3**
   Revisit the motivational example from Chapter 3 (lecture slide 4). Does Lottery 1 second-order stochastically dominate Lottery 2? Draw a suitable diagram to answer this question.