

LO.a: Describe steps in running a simulation.

1. While running a simulation, which of the following step comes after the ‘Check for correlation across variables’ step?
 - A. Determine “probabilistic” variables.
 - B. Define probability distributions for these variables.
 - C. Run the simulation.

LO.b: Explain three ways to define the probability distributions for a simulation’s variables.

2. Which of the following is *least likely* a way to define the probability distribution for a simulation’s variable?
 - A. Use historical data.
 - B. Use expert polls.
 - C. Use cross sectional data.

LO.c: Describe how to treat correlation across variables in a simulation.

3. Analyst 1: While running a simulation, if there is a strong correlation across two inputs, we can pick only one of the two inputs. We can pick the input that has a bigger impact on value.
Analyst 2: While running a simulation, if there is a strong correlation across two inputs, then we can build the correlation explicitly into the simulation.
 - A. Analyst 1 is correct.
 - B. Analyst 2 is correct.
 - C. Both analysts are correct.

LO.d: Describe advantages of using simulations in decision making.

4. Which of the following is *least likely* an advantage of using simulations in decision making?
 - A. Simulations result in better input estimation.
 - B. Simulations yield a distribution for the expected value rather than a point estimate.
 - C. Simulations yield better estimates of expected values.

LO.e: Describe some common constraints introduced into simulations.

5. The interest rate on a loan is tied to how much money the company makes. If the company loses money then the control of the firm will shift to the lenders. This is *most likely* a(n):
 - A. book value constraints.
 - B. earnings and cash flow constraints
 - C. market value constraints

LO.f: Describe issues in using simulations in risk assessment.

6. Which of the following is *least likely* an issue faced when using simulations in risk assessment?

- A. Constraints cannot be modeled.
- B. Real data may not fit distributions.
- C. Correlations across inputs can change.

LO.g: Compare scenario analysis, decision trees, and simulations.

7. If an investment is exposed to risks that are discrete, correlated and concurrent, then which of the following probabilistic approaches is *most appropriate*?
- A. Decision Tree.
 - B. Scenario analysis.
 - C. Simulations.

Solutions:

1. C is correct. The steps in running a simulation are:
 1. Determine “probabilistic” variables.
 2. Define probability distributions for these variables.
 3. Check for correlation across variables
2. B is correct. The three ways to define the probability distribution for a simulation’s variable are:
 - a. Historical data.
 - b. Cross sectional data.
 - c. Statistical distribution and parameters
3. C is correct. These are the two choices we have when we come across a strong correlations across inputs while running a simulation.
4. C is correct. Simulation does not necessarily provide better estimates of expected value than conventional risk-adjusted models.
5. B is correct.
6. A is correct. The key issues faced are:
 - a. Garbage in, garbage out.
 - b. Real data may not fit distributions.
 - c. Non-stationary distributions.
 - d. Changing correlation across inputs.
7. B is correct.

Discrete/ Continuous	Correlated/ Independent	Sequential/ Concurrent	Risk Approach
Discrete	Independent	Sequential	Decision tree
Discrete	Correlated	Concurrent	Scenario analysis
Continuous	Either	Either	Simulations