

7.8: Statistical Literacy

Learning Objectives

- Evaluating "Tail Risk"

Risk analyses often are based on the assumption of normal distributions. Critics have said that extreme events in reality are more frequent than would be expected assuming normality. The assumption has even been called a "[Great Intellectual Fraud](#)."

A recent article discussing how to protect investments against extreme events defined "tail risk" as "A tail risk, or extreme shock to financial markets, is technically defined as an investment that moves more than three standard deviations from the mean of a normal distribution of investment returns."

Example 7.8.1: what do you think?

Tail risk can be evaluated by assuming a normal distribution and computing the probability of such an event. Is that how "tail risk" should be evaluated?

Solution

Events more than three standard deviations from the mean are very rare for normal distributions. However, they are not as rare for other distributions such as highly-skewed distributions. If the normal distribution is used to assess the probability of tail events defined this way, then the "tail risk" will be underestimated.

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