JOURNAL ARTICLE

The covariance sign of transformed random variables with applications to economics and finance

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Abstract

A number of problems in economics, finance and insurance rely on determining the sign of the covariance of two transformations of a random variable. The classical Chebyshev's inequality offers a powerful tool for solving the problem, but it assumes that the transformations are monotonic, which is not always the case in applications. For this reason, in the present paper, we establish new results for determining the covariance sign and provide further insights into the area. Unlike many previous works, our method of analysis, which is probabilistic in its nature, does not rely on the classical Höffding's representation of the covariance or on any of its numerous extensions and generalizations. We motivate our research with several problems arising in economics, finance and insurance.

Chebyshev's inequality, covariance inequality, decision under risk

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