

The influence of ratios and combined ratios on the distribution of the product of two independent Gaussian random variables

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The distribution of the product of Gaussian random variables has been of interest to various authors in different research application areas. Among other results, it is known that the distribution of product of Gaussian random variables is good for small values of variation coefficients. By using simulation techniques, in this work our aim is to study which ratios have more influence on the presence of normality for the product of two independent Gaussian variables and to quantify this influence. We will consider the variation coefficient value, the individual ratios (means divided by standard deviation) and the combined ratio (product of the two means divided by variance) of two Gaussian variables considering the homocedastic and the heterocedastic cases.

Key Words: variation coefficient, simulation, normality, approximation methods