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# Asymptotic Representation of Ratio Statistics and Their Mean Squared Errors

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**Abstract:** Some statistics in common use take a form of a ratio of two statistics such as sample correlation coefficient, Pearson's coefficient of variation and so on. In this paper, obtaining an asymptotic representation of the ratio statistic until the third order term, we will discuss asymptotic mean squared errors of the ratio statistics. We will also discuss bias correction of the sample correlation coefficient and the sample coefficient of variation. Mean squared errors of the corrected estimators are also obtained.

**Key words:** asymptotic mean squared error, asymptotic *U*-statistics, bias correction, coefficient of variation, correlation coefficient, *H*-decomposition

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