Bootstrap confidence regions for multinomial probabilities based on penalized power-divergence test statistics

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Abstract

In general confidence regions for multinomial probabilities are constructed based on the Pearson χ^2 statistic. [1] constructed the bootstrap and asymptotic confidence regions for multinomial parameters based on power-divergence test statistics . In this study, we consider confidence regions for multinomial probabilities based on ordinary and penalized power-divergence test statistics. We built bootstrap and asymptotic confidence regions. We use two types of bootstrap confidence regions. The first type is called percentile interval which is the mostly used version of bootstrap intervals. The second type is Bca interval proposed by [2] as the improved version of percentile interval. We only consider small sample sizes where asymptotic properties fail and the alternative methods are needed mostly. Performances are compared based on average coverage probabilities calculated by designed simulation studies.

Keywords

Bca interval, Bootstrap, Power-divergence test statistics, Penalization.

References

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