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Pino-Mejías, R.; Jiménez-Gamero, M.D.; Enguix-González, A

A Monte Carlo comparison of three consistent bootstrap procedures.

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Summary: Since bootstrap samples are simple random samples with replacement from the original sample, the information content of some bootstrap samples can be very low. To avoid this fact, some authors have proposed several variants of the classical bootstrap. In this paper we consider two of them: the sequential or Poisson bootstrap and the reduced bootstrap. Both of them, like ordinary bootstrap, can yield second order accurate distribution estimators, that is, the three bootstrap procedures are asymptotically equivalent. The question that naturally arises is which of them should be used in a practical situation, in other words, which of them should be used for finite sample sizes. To try to answer this question, we have carried out a simulation study. Although no method was found to exhibit best performance in all the considered situations, some recommendations are given.

Classification: K70 K90
Keywords: bootstrap; Poisson bootstrap; reduced bootstrap; distribution estimation; finite sample performance