

## ON THE ASYMPTOTIC ACCURACY OF THE BOOTSTRAP UNDER ARBITRARY RESAMPLING SIZE

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(Received September 10, 2001; revised July 15, 2002)

**Abstract.** We study the order of convergence of the Kolmogorov-Smirnov distance for the bootstrap of the mean and the bootstrap of quantiles when an arbitrary bootstrap sample size is used. We see that for the bootstrap of the mean, the best order of the bootstrap sample is of the order of  $n$ , where  $n$  is the sample size. In the case of non-lattice distributions and the bootstrap of the sample mean, the bootstrap removes the effect of the skewness of the distribution only when the bootstrap sample equals the sample size. However, for the bootstrap of quantiles, the preferred order of the bootstrap sample is  $n^{2/3}$ . For the bootstrap of quantiles, if the bootstrap sample is of order  $n^2$  or bigger, the bootstrap is not consistent.

*Key words and phrases:* Bootstrap, quantile.