

Degenerate U - and V -statistics under ergodicity: asymptotics, bootstrap and applications in statistics

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Abstract We derive the asymptotic distributions of degenerate U - and V -statistics of stationary and ergodic random variables. Statistics of these types naturally appear as approximations of test statistics. Since the limit variables are of complicated structure, typically depending on unknown parameters, quantiles can hardly be obtained directly. Therefore, we prove a general result on the consistency of model-based bootstrap methods for U - and V -statistics under easily verifiable conditions. Three applications to hypothesis testing are presented. Finally, the finite sample behavior of the bootstrap-based tests is illustrated by a simulation study.

Keywords Bootstrap · Ergodicity · U -statistic · V -statistic · Cramér-von Mises-type test