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Empirical likelihood for conditional quantile with left-truncated and dependent data

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Abstract In this paper, we employ the method of empirical likelihood to construct confidence intervals for a conditional quantile in the presence and absence of auxiliary information, respectively, for the left-truncation model. It is proved that the empirical likelihood ratio admits a limiting chi-square distribution with one degree of freedom when the lifetime observations with multivariate covariates form a stationary α-mixing sequence. For the problem of testing a hypothesis on the conditional quantile, it is shown that the asymptotic power of the test statistic based on the empirical likelihood ratio with the auxiliary information is larger than that of the one based on the standard empirical likelihood ratio. The finite sample performance of the empirical likelihood confidence intervals in the presence and absence of auxiliary information is investigated through simulations.

Keywords Empirical likelihood · Conditional quantile · Truncated data · α-mixing · Auxiliary information