



Copula and composite quantile regression-based estimating equations for longitudinal data

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Abstract

Composite quantile regression (CQR) is a powerful complement to the usual mean regression and becomes increasingly popular due to its robustness and efficiency. In longitudinal studies, it is necessary to consider the intra-subject correlation among repeated measures to improve the estimation efficiency. This paper proposes a new approach that uses copula to account for intra-subject dependence in CQR. By using the copula-based covariance matrix, efficient CQR estimating equations are constructed for the longitudinal data partial linear varying coefficient models. Our proposed new methods are flexible, and can provide efficient estimation. The properties of the proposed methods are established theoretically, and assessed numerically through simulation studies and real data analysis.

Keywords Composite quantile regression · Longitudinal data · Copula · Efficiency · Robustness

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