

# Quantile regression and variable selection of single-index coefficient model

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**Abstract** In this paper, a minimizing average check loss estimation (MACLE) procedure is proposed for the single-index coefficient model (SICM) in the framework of quantile regression (QR). The resulting estimators have the asymptotic normality and achieve the best convergence rate. Furthermore, a variable selection method is investigated for the QRSICM by combining MACLE method with the adaptive LASSO penalty, and we also established the oracle property of the proposed variable selection method. Extensive simulations are conducted to assess the finite sample performance of the proposed estimation and variable selection procedure under various error settings. Finally, we present a real-data application of the proposed approach.

**Keywords** Single index coefficient model · Quantile regression · Asymptotic normality · Variable selection · Adaptive LASSO · Oracle property

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