

# High-dimensional expectile regression with a possible change point

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**Abstract:** Large-dimensional factor model has drawn much attention in the big-data era, which characterizes the dependency structure of big-data set by a few latent factors and thus achieves great dimension reduction. Conventional methods for estimating factor model often ignore the effect of heavy-tailedness of data and thus may result in inefficient or even inconsistent estimation. In this paper, we propose robust estimators for both the factor loadings and factor scores by adopting the Elliptical Factor Model (EFM) framework. The robustness is achieved by a two-step estimation procedure. In the first step, Multivariate Kendall's tau matrix is employed to estimate the space spanned by the columns of the factor loading matrix. In the second step, we propose to estimate the factor scores by Ordinary Least Square (OLS) regression. Theoretically, we show that the factor loadings and scores as well as the common components can be estimated consistently without exerting any moment condition. The finite sample performance of the proposed method is assessed through simulation and the analysis of a macroeconomic dataset.