

Computational aspects of censored quantile regression

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Abstract: Similar to standard quantile regressions, the censored quantile regression estimate interpolates some data points. This paper discusses the algorithms used in empirical research in light of this interpolation property and compares their performance in a simulation study. The results show that the ranking between algorithms differs depending on the criterion used. The algorithm BRCENS, suggested by the author in the past, performs best in terms of the frequency that the exact censored quantile regression estimates are obtained, it is very competitive in terms of the computation times required and its performance can be noticeably improved, when trying out various starting values. However, BRCENS is not optimal in terms of the root-mean-squared deviation of the coefficient estimates, indicating a high skewness of the distribution of the deviation from the exact estimates. Overall, BRCENS can be recommended for moderate degrees of censoring, whereas all practical algorithms perform quite poorly when a lot of censoring is present.

Key words: Censored quantile regression, algorithms, BRCENS, ILPA, NLRQ.

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1 Introduction

Censored quantile regressions (CQR's), introduced by Powell (1984, 1986), are an attractive approach to the estimation of the censored regression model with fixed known censoring points.¹ First, compared to Tobit maximum likelihood estimation, cf. Amemiya (1985, chapter 10), CQR's provide consistent estimates under far weaker distributional assumptions. Second,

¹Buchinsky (1997, section 8) and Fitzenberger (1997) provide general guides to CQR's.