

## Efficient Model Selection in Linear and Non-Linear Quantile Regression by Cross-Validation

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**Abstract :** Check loss function is used to define quantile regression. In the prospect of cross validation, it is also employed as a validation function when underlying truth is unknown. However, our empirical study indicates that the validation with check loss often leads to choosing an over estimated fits. In this work, we suggest a modified or L2-adjusted check loss which rounds the sharp corner in the middle of check loss. It has a large effect of guarding against over fitted model in some extent. Through various simulation settings of linear and non-linear regressions, the improvement of check loss by L2 adjustment is empirically examined. This adjustment is devised to shrink to zero as sample size grows.

**Keywords :** cross-validation, model selection, quantile regression, tuning parameter selection

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