

NONPARAMETRIC MODEL CHECK FOR CURE RATE QUANTILE REGRESSION

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ABSTRACT

In classical survival analysis, a fundamental assumption is that all individuals will eventually experience the event of interest. However, it often occurs that a subset of subjects will never experience the event. These individuals are typically considered to have infinite survival times and are classified as “cured”. To deal with this phenomenon, classical survival models have been extended to what is commonly referred to as cure models. A thorough review of this kind of models from the standpoint of classical mean regression can be found in Amico and Van Keilegom (2018).

On the other hand, in the context of quantile regression (which aim is to provide a more detailed description of the conditional distribution of the response variable) the problem of estimating a cure rate model has been scarcely addressed in the literature. Specifically, only the work of Wu and Yin (2013), and more recently that of Narisetty and Koenker (2022), can be highlighted.

Throughout this talk, a new lack-of-fit test for cure models in the context of quantile regression is presented. This new proposal represents the first contribution in the literature to test the effect of a group of covariates on a survival time using empirical processes marked by residuals. The asymptotic behaviour of the test statistics will be derived. In addition, an extensive simulation study and a real data application will be presented to show the performance of the new proposal in practice.

Keywords: Cure models, Quantile regression, Lack-of-fit test.

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