Focused information criteria, model selection and model averaging in a Tobit Model with a non-zero threshold

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Abstract

In a recent paper, Claeskens and Hjort (2003) developed a Focused Information Criterion (FIC) for model selection. Unlike common model selection methods that lead to a single model for all purposes, the FIC selects different models for different purposes. In another paper, Hjort and Claeskens (2003) presented model averaging as an alternative to model selection, and suggested a local mis-specification framework for studying the limiting distributions and asymptotic risk properties of post model selection and model average estimators in parametric models. Despite the bourgeoning literature on Tobit models, little work has been undertaken with respect to model selection explicitly in the Tobit context. In this paper, we propose FICs for variable selection allowing for such measures as the MAD, MSE, and expected LINEX errors in a Type I Tobit model with an unknown threshold. We also develop a model average Tobit estimator using values of a smoothed version of the FIC as weights. The finite sample performance of model selection and model average estimators resulting from various FICs is studied via a Monte Carlo experiment, where the possibility of using a model screening procedure prior to combining the models is also demonstrated. Finally, we present an example from a well-known study on married womens working hours to illustrate the estimation methods discussed.

Keywords

Backward elimination, Censored regression, Local mis-specification, Model screening.

References

Claeskens, G. and Hjort, N.L. (2003). The focused information criterion [with discussion]. *J. Amer. Statist. Assoc. 98*, 900–916.