

Comparing variance estimators: a test-based relative-efficiency approach

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Abstract

When constructing Wald tests, consistency is the key property required for the variance estimator. This property ensures asymptotic validity of the test and classical efficiency comparisons based on local-asymptotics indicate all consistent variance estimators lead to equivalent tests. This paper develops an asymptotic framework in which the efficiency consequences of variance estimation can be quantified and compared across different variance estimators. The main insight is that under fixed alternatives. The general asymptotic theory is developed and several environments are considered, including generalized methods of moments (GMM), quantile regression, heavy-tailed data, and cluster-robust inference. In the case of cluster-robust inference, it is shown that there is an asymptotic penalty paid for adopting a conservative approach to inference. An application demonstrates how researchers can use these new findings to conduct power analysis and incorporate these costs into their own approach to empirical work.

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