

Optimal Minimax Rates of Specification Tests for IV Regression

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Abstract

Empirical economic studies widely employ instrumental variable models to address endogeneity. This study proposes a consistent specification test for instrumental variable models. Our testing procedure is easy to implement because it involves no nonparametric kernel smoothing or integration. We show that the test has prescribed nontrivial power uniformly against a set of alternatives defined in a specific smoothness class that converge to the null model at the rate $n^{-1/4}$. This rate is the optimal minimax rate of specification tests for instrumental variable models if alternative models belong to a set of non-smooth functions.

Keywords: instrumental variable model; specification test; minimax approach

JEL Classification: C12; C52; C14

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