

Testing Instrumental Variable Validity with High-Dimensional Data and Heteroskedasticity

Qingliang Fan^{*} Zijian Guo[†] Ziwei Mei[‡]

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Abstract

This paper proposes a new instrumental variable validity test (called the Q test) for high-dimensional data. This test is based on estimation and inference for quadratic form of high-dimensional parameters. It is shown to have desired asymptotic size and power properties under heteroskedasticity, even if the number of instruments and covariates is larger than the sample size. Simulation results show that the new test performs favorably compared to existing alternative tests (Chao et al., 2014; Kolesár, 2018; Carrasco and Doukali, 2021). An empirical example of the trade and economic growth nexus illustrates the usefulness of the proposed method.

JEL classification: C12, C21, C26, C55

Keywords: instrument validity, Q test, quadratic form, heteroskedasticity, data-rich environment.

^{*}Department of Economics, the Chinese University of Hong Kong. Email: michealfan@gmail.com.
[†]Department of Statistics, Rutgers University. Email: zijguo@stat.rutgers.edu. [‡]Department of Economics, the Chinese University of Hong Kong. Email: zwmei@link.cuhk.edu.hk.