

# Weak identification and confidence sets for covariances between errors and endogenous regressors: finite-sample and asymptotic theory\*

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## ABSTRACT

In this paper, we focus on structural models and propose a finite-and large-sample projection-based techniques for building confidence sets for the endogeneity parameter between errors and regressors allowing for the presence of weak identification. First, we show that our procedure is robust to weak identification and provide analytic forms of the confidence sets for endogeneity parameter. Second, we provide necessary and sufficient conditions under which such confidence sets are bounded in both finite-and large-sample. Finally, after formulating a general asymptotic framework which allows one to take into account a possible heteroskedasticity and/or autocorrelation of model residuals, we show that our procedure is asymptotically robust to these problems (heteroskedasticity and/or autocorrelation).

**Key words:** Anderson-Rubin test statistic; projection-based techniques; confidence sets; endogeneity parameter; weak identification.

**JEL classification:** C3; C12; C15; C52.