

The University of Chicago

Department of Statistics

Seminar

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“Overidentifying Restrictions Tests and Sensitivity Analysis for Instrumental Variables Regression”

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ABSTRACT

Instrumental variables (IV) regression is a method for overcoming problems of confounding and measurement error in estimating causal relationships. The ability of IV regression to overcome these problems rests on the assumption that the proposed instruments are “valid,” meaning that they are independent of the unmeasured confounding variables and the measurement error. Often there is a degree of uncertainty about the validity of the proposed instruments. Two useful methods for incorporating such uncertainty into the statistical analysis of an IV regression are the following: (i) When the number of instruments is greater than the number of included endogenous variables, the validity of the instruments can be tested via an “overidentifying restrictions test”; (ii) A sensitivity analysis can be carried out to examine how much the results differ if plausible correlations between the proposed instruments and the unmeasured confounding variables/measurement error are entertained. This talk describes a methodology for combining the information in an overidentifying restrictions test and a sensitivity analysis. The methodology provides insight into the circumstances under which failure to reject the validity of the instruments via an overidentifying restrictions test increases confidence in the results from an IV regression. The methodology is illustrated through an empirical study of the income elasticity of demand for food among Philippine rural households. Time permitting, two other aspects of IV regression, diagnostics for model misspecification and robustness to misspecification of parts of the model, will be discussed in reference to the empirical study of income elasticity.

