|  |  |  |
| --- | --- | --- |
| ?2010, Carrol, Chen and Hu  Identification and Estimation of Nonlinear Models Using Two Samples with Nonclassical Measurement Errors | Key Notes | *Thoughts/Comments* |
| **Primary**  This paper has two contributions:   1. Using two sample, without resorting to IVs or validation sample, identify 3 densities: i. structural model; ii. Error model; iii. Latent model. 2. It develops a sieve QMLE to do estimation and inference, under the framework of parametric, semiparametric and nonparametric.    * This paper stems from the fact that there is lack of repeated measurements (IV), validation sample or the knowledge of distribution of measurement error.    * Strength of this methods:      + Allow *nonclassical* measurement error      + Neither sample contains an accurate measurement of the latent true variable    * Restrictions:      + Error-free covariates are discrete      + High-level assumptions on operators.      + Conditional distribution of structural models are the same in two samples. | *Some are relaxed;*  *Some must be strong.* |
| **Model** Y: continuous  1. X\*: unobserved true; continuous 2. X: observed surrogate for X\* 3. W: accurately measured covariate   ; discrete   1. For the auxiliary sample, similar conditions. | *Think out assumptions on W, and why?*  *What is probability weighting?* |
| **Assumptions**  A2.1: W is not exogenous.  A2.2: Nondifferential measurement error.  A2.3: Densities of M.E. are complete  /boundedly complete  A2.4: Samples are not random. Two latent  distributions are not identical in two  samples.  A2.5: Certain location restriction. | * *A2.1 implies the conditional dist of y given (X\*,W).* * *A2.2 means X\* contains whole info about X.* * *A2.3 is quite technical. See Andrews JoE 2017 about L2-complete introduced.* * *Why not random?* * *A2.1 and A2.4 matter* |
| **Example 2** | * *To see why it satisfies all assumptions, and support the theorem.* * *How can Y depend on W?* * *Typos? The mean of X\_a^\** |
| **Identification Strategy**   * + : by spectrum decomposition   + : by operator operations   + : by density operation   + : linear operator   + :idensity operations | * *Method similar to Hu & Schennach 2008, Hu & Shum 2012: deriving a spectrum decomposition.* * *Linear operators are not defined clearly?* * *Equation A.4 :*   + - *Use D? diagonal operator* * *The domain of inverse is not discussed?* |
|  |  |  |