Robust Exponential Tilting Approximation: A Monte Carlo Study of the Stochastic Lognormal Volatility Model

Abstract

Procedures based on the Generalized Method of Moments (GMM) (Hansen, 1982) are basic tools in modern econometrics to estimate the parameters and make inference in moment condition models. In general, the inferential tools (p-values and confidence intervals) are based on first order asymptotic theory. It is well-known that the (first order) asymptotic distribution does not provide accuratep-values and confidence intervals in moderate to small samples. Moreover, in the presence of small deviations from the assumed model, p-values and confidence intervals based on classical GMM procedures can be drastically affected (nonro-bustness). Several alternative techniques have been proposed in the literature to
improve the accuracy of GMM procedures. These alternatives address either the first order accuracy of the approximations (information and entropy econometrics (IEE)) or the nonrobustness (Robust GMM estimators and tests).

This presentation is a part of the results of my PhD thesis where I propose a new alternative procedure which combines robustness properties and accuracy in small samples. Specifically, I combine IEE techniques as developed in Imbens, Spady, Johnson (1998) to obtain finite sample accuracy with robust methods obtained by bounding the original orthogonality function as proposed in Ronchetti and Trojani(2001). This leads to new robust estimators and tests in moment condition models with excellent finite sample accuracy. Finally, I illustrate the accuracy of the new statistic by means of some simulations for Chi-squared moments and Stochastic lognormal volatility models.