Seck, Ousman "Monte Carlo Experiments and Consumer Demand Modelling"

Using Monte Carlo experiments, I tackle in this dissertation some unanswered questions in consumer demand modelling. The first problem concerns the choice of functional forms. Among the many demand specifications in the literature, the Rotterdam model (Theil, 1965, 1975 and Barten, 1964, 1968) and the Almost Ideal Demand System (AIDS) (Deaton and Muellbauer, 1980a) have the specificity of having particularly long histories and being highly developed. In addition, they are often applied in consumer demand system modelling. The AIDS is frequently estimated in its linear approximated form (LA-AIDS) even though its founders recommended the linearization only if prices are almost collinear. Using data generated from known, I pursue three objectives: compare the AIDS to the Rotterdam, derive the true elasticities when the AIDS is linearized using different price indices, and compare the resulting linear approximated AIDS to the nonlinear AIDS. I find that the Rotterdam performs better than the AIDS. The LA-AIDS yield close results, but they badly approximate the nonlinear AIDS.

In modeling consumer demand, the properties for the demand functions to be consistent with economic theory (such as monotonicity) are either imposed or tested. I investigate the implications, for inference, of inequality constraints on the parameters. They truncate sampling distributions, which invalidates statistical inference based on asymptotic normality. The method of squaring is a common solution used to transform the constrained parameter estimation into an unconstrained one. The problem is that the sign of the unconstrained parameter estimator is undefined. Therefore, one regularity condition is missing and the estimator cannot be asymptotically normal. My goal is to answer two questions: [1] Can we ignore the identification problem? [2] How well do the bootstrap and the Jackknife perform in terms of approximating the true standard errors of the constrained estimator?

I find that the asymptotic standard errors are invariant to the functional form utilized to eliminate the inequality constraint, that the bootstrap performs well and dominates jackknife. The jackknifed standard errors converge hardly to the true standard errors of the estimators as more observations are deleted. I recommend the bootstrapped or the asymptotic standard errors.