The Special Issue in Honor of Aman Ullah: An Overview*

Esfandiar Maasoumi, and Qi Li

1 A Brief history of Aman Ullah and his seminal contributions to Econometrics

For about four decades, Aman Ullah has been a leading scholar in the field of econometrics. Several of his professional colleagues, friends and students decided to have a major special issue of a refereed journal to honor his many contributions to the field. There was also a related conference in his honor at Chengdu, China in 2012. This special issue is thus dedicated to Aman, the scholar, teacher and friend.

Aman Ullah obtained his BA in Statistics, Economics, and Mathematics followed by an MS in Mathematical Statistics from Lucknow University in Uttar Pradesh India. He completed his Ph.D in Economics at the University of Delhi, India. He then relocated to North America where he has held posts at Southern Methodist University, the University of Western Ontario, and the University of California Riverside where he currently holds the post of Distinguished University Professor.

Aman has been an Associate Editor and Board member of Econometric Reviews since 1987, having served as long as the editor. He has served and serves on numerous other editorial boards, such as Journal of Quantitative Economics, Journal of Nonparametric Statistics, Empirical Economics, Sankhya, and American Journal of Mathematical and Management Sciences. He is the Series Editor for Statistics and Econometrics published by Chapman-Hall/Taylor-Francis.

Aman has made seminal contributions in a number of sub-disciplines in Econometrics including nonparametric estimation and inference, finite-sample theory, information theory, and shrinkage methods. He has formidable list of publications that number well over 100 in the leading journals, including Econometrica, Journal of Econometrics, Journal of Business and Economic Statistics, Journal of the American Statistical Association, Review of Economic and Statistics, Econometric Theory and the Journal of Applied Econometrics. He has authored or co-authored eight books:


*Grateful thanks to Jeffrey Racine and Feng Yao for input and help with this overview.
As an educator Aman has mentored scores of Ph.D. students, serving as the main supervisor for K. Kadiyala, A. Hoque, L. Magee, F. Camacho, S. Power, T. Peters, P. Rilstone, J. Racine, Y. Fan, A. Ngereng, Z. Zhou, M. Tengesdal, M. Mercurio, S. Kumar, K. Mundra, G. Popli, D. Mukherjee, D. Henderson, Y. Bao, D. Chambers, M. Das, S. Dhongde, B. Gress, W. Sun, and X. Huang, and as a committee member on far too many dissertations to list here.

Aman’s commitment as an educator, mentor, and his seemingly limitless fountain of inspiration is highlighted in the various contributions contained in this special issue in his honor. He is known for his modesty and spirituality. Combined with his unique and enduring scholarly creativity, he continues to be a great presence in our profession.

As we pen this foreword, Aman, we would like to underscore the fact that you honor us with your virtual presence in your work, your physical presence during our studies and at conferences and workshops, and your spiritual presence where you humbly lead by example demonstrating the highest qualities that academics could strive for.

The papers in this Special Issue can be placed into four categories: 1. Endogeneity; 2. Nonparametric/semiparametric estimation methods; 3. Hypothesis testing; 4. Parametric methods in constructing common factors and estimating conditional variance.

2 Endogeneity.

The first category consists of six papers. Baltagi and Deng propose a 3SLS estimator for a simultaneous system of spatial autoregressive equations with random effects, which can handle endogeneity, spatial lag dependence, heterogeneity and cross equation correlation. The Monte Carlo experiments suggest
there is potential gain in finite sample efficiency. Cai, Chen and Fang propose a three-stage estimation for a semiparametric dynamic panel data model, where the regressors may contain lagged dependent variables and endogenous variables. The first two stages involve estimating all coefficients with nonparametric GMM and estimating the parametric coefficient by an averaging method. The third stage produces an estimator of the varying coefficient from partial residuals. They derive the consistency and asymptotic normality of both estimators. Monte Carlo simulations demonstrate that the proposed estimator performs well in finite sample settings. Hirano and Porter consider statistical models in which the mapping from the reduced form distribution to the structural parameters is singular. This implies that the point estimators cannot be unbiased, quantile-unbiased, or translation equivalent. Bias reduction procedures cannot fully remove bias, and face a nontrivial bias-variance tradeoff in finite samples. Escanciano and Zhu consider a two-step semiparametric estimator for the sample selection model, where the bandwidth for the nonparametric component is chosen to minimize the mean squared error of the fitted semiparametric model. The paper demonstrates that the data-driven estimator is asymptotically normal and uniform in the bandwidth. A Monte Carlo study suggests that the estimator has excellent finite sample performance. Dong, Gan and Wang propose a new model to identify if and how much the educational attainment gap between blacks and whites is due to the difference in their neighborhoods. There is a substantial neighborhood effect for the movers who belong to the endogenous type, who may move in response to the neighborhood effect on their education. The endogenous type has more education and moves more often than the exogenous type, who may move for reasons unrelated to education. On average, they find that the neighborhood variable (the percentage of high school graduates in the neighborhood) accounts for about 28.96% of the education gap between blacks and whites. Ai and Meng consider a semiparametric panel binary choice model with fixed effects and continuous endogenous regressors. A first stage nonparametric panel regression with fixed effect generates estimated residuals. The smoothed maximum score estimation is performed in the second stage to estimate the parameters with the residuals as an added regressor. They obtain the consistency and asymptotic normality of the finite dimensional parameter and illustrate solid finite sample performance in a simulation study.

3 Nonparametric/semiparametric estimation methods.

There are six papers in this category. Fan and Liu propose a symmetrized multivariate k-NN estimator for the conditional mean and for the conditional distribution function, and provide the asymptotic properties. The asymptotic distribution of the proposed k-NN estimator does not depend on the existence of the marginal probability density function of the covariates. The simulation illustrates improvement over the Nadaraya-Watson estimator at evaluation points
away from the center. Saart, Gao and Allen propose a semiparametric regression approach to a nonlinear Autoregressive Conditional Duration model that allows flexibilities in the dynamics of the conditional duration model and the shape of the hazard function. The estimation is performed via an iterative algorithm. They establish the semiparametric estimators’ asymptotic properties and illustrate that the estimators exhibit robust finite sample performance in simulations. Liang, Lin and Hsiao establish the asymptotic theory of the local linear estimator of a nonparametric cointegration model. Using least squares cross validation to select smoothing parameters, they demonstrate substantial finite sample efficiency gains of the local linear estimator over the local constant estimator in the simulation study. Martins-Filho, Yao and Torero consider two stage estimation for a high order conditional quantile. Utilizing the first stage nonparametric regression residual, they estimate the tail and quantile of conditional distribution by extreme value theory to approximate the tail distribution with a generalized Pareto distribution. They obtain the asymptotic properties of the estimator and illustrate their implementation and finite sample performance in a simulation study. Gao, Liu and Racine propose an estimator for the partially linear model for $\beta$--mixing time series data, where both continuous and categorical variables can appear in the nonparametric component. The authors establish their asymptotic distributions and demonstrate that the estimators can outperform existing specifications in simulations. They also provided an application using SIPP data to model a dynamic labor supply function. Gu, Li and Yang obtain explicit leading bias terms for the local polynomial estimator in a general nonparametric multivariate regression model, under smoother conditions on the unknown regression function. The results can be used to obtain optimal smoothing parameters in local polynomial estimation of the unknown conditional mean and derivative functions.

4 Hypothesis testing.

Five papers are found in this category. Du and Escanciano propose a test for the serial independence of estimated residuals in location-scale models, and the test statistics have the same asymptotic distributions as the ones with true errors. They construct a generalized spectral test, and show it to be asymptotically distribution-free and powerful against any type of pairwise dependence at all lags. Simulations validate theoretical findings. Phillips and Lee develop limit theory for nonstationary vector autoregression (VAR) with mixed roots in the vicinity of unity involving persistent and explosive components. They further consider statistical tests for common roots and model selection for discriminating roots. The results can be used to distinguish mildly explosive roots from roots that are local to unity and for testing commonality in persistence. Su, Tu and Ullah consider testing additive error structure in nonparametric structural models, against the alternative that the error enters the model nonadditively. The test statistic is motivated by the fact that the partial derivative of the nonparametric structural function with respect to the error is one under additivity.
They establish the test’s asymptotic properties and propose a bootstrap version of the test. Simulations show that the test has proper size and reasonable power in finite samples. Pesaran considers tests for errors in a panel data model to be weakly cross sectionally dependent, using the exponent of cross sectional dependence (CD). It is shown that the implicit null of the CD test depends on the relative expansion rates of N and T. In large N panels, the null of weak dependence is more appropriate than independence. With symmetric errors, the test has a standard normal distribution. The Monte Carlo evidence demonstrates the test to be a simple and powerful test of weak CD in both static and dynamic panels. Zhang, Barassi and Tan propose a residual based approach to test for the null of no cointegration against a fractional alternative which relies on the Exact Local Whittle Estimator. They compare its performance to other residual based tests for fractional cointegration, and investigate the term structure of interest rates in the UK and US, concluding that the term spread is indeed a mean reverting process with long memory.

5 Parametric methods in constructing common factors and estimating conditional variance.

The last category consists of two papers. Ng reviews and explores various matrix decomposition based methods for estimating common factors. The methods are extended to analyze categorical data, which involves quantifying the ordinal and nominal variables. Interestingly, the factor space can be quite precisely estimated directly from categorical data without quantification. Galbraith, Zinde-Walsh and Zhu estimate the GARCH model parameters using auxiliary information on latent variance. They obtain consistent estimates of the infinite ARCH representation parameters via a regression using the estimated quadratic variation. The GARCH parameters are estimated with a minimum distance estimator based on estimated ARCH parameters. They show the consistency and asymptotic normality with LAD estimation of truncated ARCH approximations. The simulations illustrate that the ARCH-regression estimators may be competitive with QML, and potentially more precise if sufficient intra-day information is available.

References

5. Yan Dong, Li Gan and Yingning Wang, “Residential Mobility, Neighborhood Effects, and Educational Attainment of Blacks and Whites.”


17. Dayong Zhang, Marco R. Barassi, Jijun Tan, “Residual based tests for fractional cointegration: testing the term structure of interest rates.”

18. Serena Ng, “Constructing Common Factors from Continuous and Categorical Data.”