

# YUNDONG TU

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## Education

- University of California, Riverside (September 2007 – Present)
  - Ph.D., Economics (expected June 2012)
  - *Dissertation Title*: Constrained Inference in Econometrics
  - *Advisors*: Tae-Hwy Lee (Co-chair), Aman Ullah (Co-Chair), Marcelle Chauvet and Robert R. Russell
- Wuhan University (September 2000-June 2006)
  - M.A., Economics (June 2006)
  - B.S., Mathematics (June 2004)

## Teaching and Research Interests

- Primary: Econometric Theory, Applied Econometrics
- Secondary: Financial Econometrics, Microeconomics, Macroeconomics

## Publication

- “Shopper City,” with Richard Arnott, in *Industrial Organization, Trade, and Social Interaction: Essays in Honour of B. Curtis Eaton*, edited by G. K. Dow, A. Eckert, and D. S. West, Chap. 5, pp. 84-111, 2010, University of Toronto Press.

## Completed Working Papers

- *Job Market Papers*
  1. **Tu, Y.**, 2011, “Model Averaging Partial Effect (MAPLE) Estimation in Large Dimensional Data”
  2. Lee, T.H., **Y. Tu** and A. Ullah, 2011, “Nonparametric and Semiparametric Regressions Subject to Monotonicity Constraints: Estimation and Forecasting,” submitted to *Journal of Econometrics*
- **Tu, Y.** and A. Ullah, 2010, “Efficient Nonparametric Estimation in Simultaneous Equation Models,” submitted to *Economics Letters (revision requested)*
- **Tu, Y.**, 2011, “Inference in Semiparametric Partial Threshold Models,” submitted to *Econometric Theory*.
- Gu, W. and **Y., Tu**, 2011, “DEA Efficiency Measures in the Presence of Dimensionality Effects,” submitted to *Journal of Productivity Analysis*
- **Tu, Y.** and T.H., Lee, 2011, “Forecasting Using Supervised Factor Models,” with Tae-Hwy Lee, submitted to *Oxford Bulletin of Economics and Statistics*
- Lee, T.H., **Y., Tu** and A., Ullah, 2011, “Forecasting Equity Premium: Global Historical Average Versus Local Historical Average and Constraints,” submitted to *Journal of Business and Economic Statistics*

## Working in Progress

- “Dating Real-time Business Cycle Turning Points,” with Marcelle Chauvet
- “Testing Additive Separability of Error Term in Nonparametric Structural Models,” with L.Su and A. Ullah
- “Nonparametric Estimation with Economic Constraints via Trimming”
- “Empirical Likelihood-based Model Averaging in Moment Restricted Parametric Models”
- “Empirical Likelihood-based Model Averaging in Moment Restricted Nonparametric Models”
- “Information-based Tests of Conditional Mean Independence”
- “Determinants of Economic Growth: a MAPLE Approach”
- “Information-based Simultaneous Variable Selection and Estimation”
- “Entropy-based MAPLE Estimation in Large Dimensional Semiparametric Models”
- “Entropy-based MAPLE Estimation in Large Dimensional Nonparametric Models”
- “Bias and Mean Squared Error of Forecasts via AR(p) Models under Asymmetric Loss”

## Honors and Awards

- Chancellor's Distinguished Fellow, University of California, Riverside, 2007- 2012
- E. J. Blakely Center for Sustainable Suburban Development Research Funding, 2008-2010
- Support for Young Economists, Econometric Society, Tokyo University, 2009
- Conference Travel Grant, GSA, University of California, Riverside, 2009- 2011
- Conference Travel Grant, Department of Economics, University of California, Riverside, 2009- 2011
- Outstanding Teaching Assistant Award, University of California, Riverside, 2009-2010
- NAPW VI Award to Young Researchers, J.A. Baker Institute for Public Policy, Rice University, 2010
- California Econometrics Conference, Travel Grant, Stanford University, 2010
- Support for Young Economists, Econometric Society, Korea University, 2011
- Phi Beta Kappa International Scholarship Award, Alpha Association, 2011

## Teaching

- Lecturer, Department of Economics, University of California, Riverside
  - Statistics for Business and Economics (Summer 2010, Spring 2011)
  - Forecasting in Business and Economics (Summer 2011)
  - Mathematics for Economics (*Graduate*, Fall 2010, Fall 2011)
  - Mini-course: MATLAB, R, LaTeX
- Lecturer, School of Economics and Management, Wuhan University, Wuhan, China
  - Econometrics (Spring/Fall 2005)
  - Game Theory (Spring 2006)
- Lecturer, School of Industrial Business, South-central University for Nationalities, Wuhan, China
  - Economic Forecasting (Fall 2006)
  - Introduction to Econometrics (Spring 2007)
- Teaching Assistant, Department of Economics, University of California, Riverside (2008 – Present)
  - *Graduate*: Econometrics Methods I (3), Econometrics Methods III, Macroeconomic Theory II
  - *Undergraduate*: Introductory Microeconomics, Introductory Macroeconomics, Intermediate Microeconomics, Statistics, Intermediate Econometrics, Managerial Economics

## Research Assistant

- For Richard Arnott, Department of Economics, University of California Riverside, Summer 2008-2010
- For Richard M.H. Suen, Department of Economics, University of California Riverside, Summer 2009

## Conference and Seminar Presentations

- Econometrics Seminar, Jan2009/May2009/Oct2010/Oct2011, University of California, Riverside
- All UC Business Cycle/Econometrics/Labor Conference, April 2009, UC Riverside (*attendee*)
- Far East and South Asia Meeting of the Econometric Society, August 2009, Tokyo University
- North America Productivity Workshop IV, June 2010, Rice University
- California Econometrics Conference, September 2010, Stanford University
- Midwest Econometrics Group, October 2010, Washington University in St. Louis
- Conference in Honor of Halbert L. White, Jr., May 2011, University of California, San Diego
- Asian Meeting of Econometric Society, August 2011, Korea University
- Midwest Econometrics Group 2011, University of Chicago
- California Econometrics Conference 2011, November 2011, University of Southern California
- Econometrics Seminar, December 5, 2011, Shanghai Jiao Tong University
- American Economic Association, ASSA, January 5-8, 2012, Chicago

## Software Skills

- Computing: C++, MATLAB, R, GAMS, GAUSS, Stata, EViews, Mathematica, Maple
- Editing: LaTeX/Winedt, Scientific WorkPlace, Microsoft Office, Tinn-R, Adobe Illustrator

## Referee

- Journal of Econometrics (1), Journal of Quantitative Economics (2), Empirical Economics (2)

## Abstracts of Completed Papers

### **Model Averaging Partial Effect Estimation in Large Dimensional Data (Job Market Paper 1)**

This paper studies the estimation of the marginal effect of one economic variable on another in the presence of large amount of other economic variables --- a problem frequently faced by applied economists. The estimation is motivated via model uncertainty that random components should be included to describe the economy according to the state of the world. A condition named "Conditional Mean Independence" is shown to be sufficient to identify the partial effect parameter of interest. In the case that the parameter of interest can be identified in more than one approximating model, we propose two estimators for such parameter: generalized-method-of-moment-based model averaging partial effect estimator (gMAPLE) and entropy-based model averaging partial effect estimator (eMAPLE). Consistency and asymptotic normality of the MAPLE estimators are established under a suitable set of conditions. Thorough simulation studies reveal that MAPLE estimators outperform factor based, variable selection (Lasso) based and other model averaging estimators including MMA of Hansen (2007), FOGLEs of White and Lu (2011), JMA of Hansen and Racine (2011). An economic example is taken to illustrate the use of MAPLE estimator to evaluate the effect of inherited control on firm performance.

### **Nonparametric and Semiparametric Regressions Subject to Monotonicity Constraints: Estimation and Forecasting (Job Market Paper 2)**

This paper considers nonparametric and semiparametric regression models subject to monotonicity constraint. We use bagging as an alternative approach to Hall and Huang (2001). Asymptotic properties of our proposed estimators and forecasts are established. Monte Carlo simulation is conducted to show their finite sample performance. An application to predicting equity premium is taken to illustrate the merits of the proposed approach. We introduce a new forecasting evaluation criterion based on the second order stochastic dominance in the size of forecast errors, which enables us to compare the competing forecasting models over different sizes of forecast errors. We show that imposing monotonicity constraint can mitigate the chance of making large size forecast errors.

### **Forecasting Equity Premium: Global Historical Mean Versus Local Historical Mean and Constraints**

Economic theory frequently dictates constraints that should be met by statistical models for quantitative analysis. Equity premium, the difference between returns on risky equity and riskless assets, is expected to be positive. This paper considers imposing such positivity constraint in a local historical average model in nonparametric kernel regression framework. We construct the constrained estimator via an indicator function which operates "model-selection" between the unconstrained local historical average and the bound of the constraint (zero for the positivity constraint).

We smooth the indicator function by bagging (Breiman 1996), which operates "model-averaging" and yields a combined forecast of unconstrained local historical mean forecasts and the constraint. The local combining weights are determined by the probability that the constraint is binding. Asymptotic properties of the constrained local historical mean forecast are established. Monte Carlo simulations are conducted to show their finite sample performance. In predicting U.S. equity premium, we show that substantial nonlinearity is present that can be captured by the nonparametric local historical mean model and that the local positivity constraint of the equity premium provides valuable prior information in improving its out-of-sample prediction.

## **Forecasting Using Supervised Factor Models**

This paper further examines the supervised factor model based on combining forecasts using principal components, namely CF-PC as labeled in Hillebrand et al (2009), in comparison with two other supervised factor models such as partial least squares (PLS) regression and principal covariate regression (PCovR) and with the unsupervised principal component regression (PCR). Computation of latent factors may be doubly supervised via variable selection. We compare the performance of supervised factor models and unsupervised model in forecasting of U.S. CPI inflation. The main empirical finding of this paper is that with proper supervision, the predictability of factor models can be improved to a large extent. Second, among the supervised factor models, the CF-PC model best performs and is most stable. Third, PLS regression performs very well in some cases but is not stable over different subsamples considered. Fourth, supervision helps to reduce the number of factors and lags needed in modeling economic structure.

## **Inference in Semiparametric Partial Threshold Models**

This paper considers instability of the parametric parameter in semiparametric partial linear model proposed by Robinson (1988), through the introduction of a threshold variable. The extended model, called partial threshold model, is estimated via a three-step procedure. Estimator of the threshold parameter is shown to have a nonstandard asymptotic distribution yet free of nuisance parameter, while estimators of the slope parameters are asymptotically normally distributed. The nonparametric component is consistently estimated and it achieves oracle efficiency, as if the threshold parameter is known. Testing for threshold effects and slope parameters are also considered. Monte Carlo experiments are carried out to compare the finite sample performance of the proposed method with direct nonparametric estimation and semiparametric partial linear models. Moreover, the proposed model is applied to study consumer demand and it shows the existence of a threshold in the fuel Engel curve.

## **Efficient Estimation of Nonparametric Simultaneous Equations Models**

This paper defines a new procedure to efficiently estimate nonparametric simultaneous equations models that have been explored by Newey et al (1999) and Su and Ullah (2008). The proposed estimation procedure exploits the additive structure and achieves oracle efficiency without the knowledge of unobserved error terms. Further, simulation results show that our new estimator outperforms that of Su and Ullah (2008) in terms of Mean Squared Error.

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## References

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