JUSHAN BAI

February 27, 2017

CONTACT INFORMATION

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EDUCATION

University of California, Berkeley, Ph.D. in Economics, 1992
Pennsylvania State University, M.A. in Economics, 1988
Nankai University, Tianjin, China, B.S. 1982, M.A. in Mathematics, 1985

CURRENT AND PAST POSITIONS

Professor, Department of Economics, Columbia, since 2008
Professor, Department of Economics, NYU, 2002-2008
Professor , Department of Economics, Boston College, 1999-2002
Associate Professor, Boston College, 1998-1999
Associate Professor, Department of Economics, MIT 1997-1998
Assistant Professor, Department of Economics, MIT, 1992-1997

RESEARCH INTERESTS

Econometrics; Panel Data Analysis, Time Series Econometrics, high dimensional factor analysis, incidental parameters, cross-sectional dependence

FORTHCOMING ARTICLES

"Clustering huge number of financial time series: a panel data approach with high-dimensional predictors and factor structures "(with Tomohiro Ando), forthcoming in *Journal of American Statistical Association.*

"Estimation and inference of FAVAR models" (with Kunpeng Li and Lina Lu), forthcoming in *Journal of Business and Economic Statistics*, 2016

"Selecting the Regularization Parameters in High-Dimensional Panel Data Models: Consistency and Efficiency" (with Tomohiro Ando), forthcoming in *Econometric Reviews,* 2016

PUBLICATIONS

``Maximum likelihood estimation and inference for approximate factor models of high dimension," (with Kunpeng Li) *Review of Economics and Statistics,* Vol. 98 (2) 298–309, 2016

"Econometric Analysis of large factor models", (with Peng Wang) *Annual Review of Economics,* Vol 8, 53-80, 2016

"Structural changes in high dimensional factor models" (with Xu Han), *Frontiers of Economics in China*, 11(1), 123-141, 2016

"Panel data models with grouped factor structure under unknown group membership" (with Tomohiro Ando), *Journal of Applied Econometrics,* 31(1) 163-191, 2016

"Cross-sectional Dependence in Panel Data Models, a special issue" (with Badi Baltagi, Hashem Pesaran), *Journal of Applied Econometrics,* 31(1), 1-3, 2016

``Efficient Estimation of Approximate Factor Models via Penalized Maximum Likelihood" (with Yuan Liao), *Journal of Econometrics, 191(1). 1-18, 2016.*

"Fama-MacBeth Two-Pass Regressions: Improving Risk Premia Estimates," (with Guofu Zhou), *Finance Research Letters, 15(C). 31-40, 2015*

"A simple new test for slope homogeneity in panel data models with interactive effects" (with Tomohiro Ando), *Economics Letters*, 136, 112-117, 2015

"Asset pricing with a general multifactor structure," with (Tomohiro Ando), *Journal of Financial Econometrics*, 13 (3): 556-604, 2015

"Identification and Bayesian estimation of dynamic factor models," (with Peng Wang), *Journal of Business and Economic Statistics*, 33 (2), 221-240, 2015

"Unbalanced panel data models with interactive effects (with J. Yang and Y. Liao), *Oxford Handbook of Panel Data,* edited by Badi Baltagi. DOI: 10.1093/oxfordhb/9780199940042.013.0005, 2015

Identification theory for high dimensional static and dynamic factor models (with Peng Wang), *Journal of Econometrics*, 178 (2), 794-804, 2014

Theory and methods of panel data models with interactive effects (with Kunpeng Li), *Annals of Statistics*, 42(1), 142-170, 2014

"Principal components estimation and identification of static factors" (with S. Ng), *Journal of Econometrics*, 176, 178-189, 2013.

"Panel data models and factor analysis," *Advances in Economics* and *Econometrics, Theory and Applications*, The Tenth World Congress of the Econometric Society, edited by D. Acemoglu, M. Arellano, and E. Dekel, Vol. III, 437-484, 2013.

Testing panel cointegration with dynamic common factors that are correlated with the regressors (with Josep Lluis Carrion-i-Silverstre), *Econometrics Journal*, 16, 222-249, 2013.

"Fixed effects dynamic panel data models, a factor analytical method," *Econometrica*, 81, 285-314, January, 2013

"Statistical analysis of factor models of high dimension", (with K.P. Li), *Annals of Statistics*, 40, 436-465, 2012.

"The Theory and Applications of TAR Model with two Threshold Variables," (with T. Chong and H.Q. Chen), *Econometric Reviews* , 31(2), 142-170, 2012.

"Estimating high dimensional covariance matrices and its applications" (with Shuzhong Shi), *Annals of Economics and Finance*, 12, 199-215, 2011.

"Conditional Markov Chain and its Application in Economic Time Series Analysis" (with P. Wang), *Journal of Applied Econometrics*, 26, 715-734, 2011

"A simple method for estimating betas when factors are measured with error" (with G. Meng and G. Hu). *Journal of Financial Research*, Vol. 34, Issue 1, 27-60, 2011

"Instrumental Variable estimation in a data rich environment" (with Serena Ng), *Econometric Theory, 26*, 1577-1606, 2010

"Panel Unit Root Tests with Cross-Section Dependence, a further investigation," (with Serena Ng) *Econometric Theory, 26*, 1088-1114, 2010

"Common breaks in means and in variances for panel data," *Journal of Econometrics,* 157, 78-92, 2010.

"Panel data models with interactive fixed effects", *Econometrica, 77,* 1229-1279, 2009

"Structural Changes, Common Stochastic Trends, and Unit Roots in Panel Data" (with Josep Lluis Carrion-i-Silverstre), *Review of Economic Studies,* 471-501, 2009

"Selecting instrument variables in a data rich environment" (with Serena Ng), *Journal of Time Series Econometrics,* 1, Article 4, 2009

"Panel Cointegration with Global Stochastic Trends" (with C. Kao, S. Ng) *Journal of Econometrics,* 145, 82-99, 2009

"Boosting diffusion indices" (with Serena Ng), *Journal of Applied Econometrics.* 24, 607-629, 2009

"Forecasting Economic Time Series with Targeted Variables" (with Serena Ng), *Journal of Econometrics.* 146, 304-317, 2008.

"Extreme estimation when the predictors are estimated from large panels" (with Serena Ng), *Annals of Economics and Finance*. 9-2, 201-222, 2008.

"Factor Models," New *Palgrave Dictionary of Economics*, 2008.

"Large Dimensional Factor Models" (with Serena Ng), *Foundations and Trends in Econometrics,* 3 (2), 89-163, 2008.

``Generic Consistency for Multiple Breaks under Misspecification (with Terence Chong, H. Chen, and S.X. Wang), *Econometrics Journal, 11 (2), 287-307, 2008.*

"Testing multivariate distributions in GARCH models" (with Zhihong Chen), *Journal of Econometrics,* Vol. 143, 19-36, 2008.

"Determine the number of primitive shocks in factor models" (with Serena Ng), *Journal of Business and Economics Statistics,* 83, 171-222, 2007

"Confidence intervals for diffusion index forecast and inference with factor-augmented regressions" (with Serena Ng), *Econometrica*, 74, 1133-1155, 2006.

"Evaluating Latent and Observed Factors in Macroeconomics and Finance" (with Serena Ng), *Journal of Econometrics*, 131, 507-537, 2006.

"On the estimation and inference of panel data cointegration with cross-section dependence" (with Chihwa Kao), *Panel data econometrics, Theoretical Contributions and empirical applications* edited by B.H. Baltagi, 2006, page 1-30. Elsevier, New York.

"Testing Skewness, Kurtosis, and Normality for Time Series" (with Serena Ng) , *Journal of Business and Economic Statistics*, 23, 49-61, 2005.

"A Panic Attack on Unit Roots and Cointegration" (with Serena Ng), *Econometrica*, 1127-1177, 2004.

"Estimating Cross-Section Common Stochastic Trends in Nonstationary Panel Data," *Journal of Econometrics*, 137-183, 2004.

"Testing Parametric Conditional Distributions of Dynamic Models," *Review of Economics and Statistics*, 85, 531-549, 2003.

"Inferential Theory for Factor Models of Large Dimensions," *Econometrica* 71, 135-171, 2003.

"Critical Values of Multiple Structural Change Tests" (with {Pierre Perron), *Econometrics Journal*, 6, 72-78, 2003.

"Computation and Analysis of Multiple Structural Changes" (with Pierre Perron), *Journal of Applied Econometrics*, 18, 1-22, 2003.

"Determine the Number of Factors in Approximate Factor Models" (with Serena Ng), *Econometrica*, 70, 191-221, 2002.

"A Consistent Test for Conditional Symmetry of Time Series." (with Serena Ng) *Journal of Econometrics***,** 103, 225-258, 2001**.**

"Vector Autoregressive Models with Structural Change in Regression Coefficients and in Variance-Covariance Matrix," *Annals of Economics and Finance*, Vol. 1, 303-339, 2000.

"Likelihood Ratio Tests for Multiple Structural Changes." *Journal of Econometrics*, Vol. 91, No. 2, 299-323, 1999.

"Multiple-Regime Regression with Least Absolutes Deviation Estimation." *Journal of Statistical Planning and Inference*, 74, 103-134, 1998.

"A Note on Spurious Breaks." *Econometric Theory*, 14, 663-669, 1998.

"Testing for and Dating Common Breaks in Multivariate Time Series," with Robin Lumsdaine and James Stock. *Review of Economic*

Studies, 65, 395-432, 1998.

"Testing for and Estimation of Multiple Structural Changes," (with Pierre Perron). *Econometrica*, 66, 47-79, 1998. Reprinted in *The Economics of Structural Change* (H. Hagemann, M. Landesmann, and R. Scazzieri, eds.), The International Library of Critical Writings in Economics (Series Editor: Mark Blaug and Adrian Darnell).

"Estimation of a Change Point in Multiple Regressions" *Review of Economics and Statistics*, 79, 551-563, 1997.

"Estimating Multiple Breaks One at a Time." *Econometric Theory*, 13, 315-352, 1997.

"Testing for Parameter Constancy in Linear Regressions: an Empirical Distribution Function Approach." *Econometrica*, 64, 597-622, 1996.

"Least Absolute Deviation Estimation of a Shift." *Econometric Theory*, 11, 403-436, 1995.

"The Impact of 1989 California Major Anti-Smoking Legislation on Cigarette Consumption: Three Years Later," with Tehwei Hu, Ted Keeler, and Paul Barnett. *Journal of Public Health Policy*, 15, 26-36, 1994.

"Least Squares Estimation of a Shift in Linear Processes." *Journal of Time Series Analysis*, 15, 453-470, 1994. Reprinted in *Recent Developments in Time Series* (Paul Newbold and Stephen J. Leybourne eds.), The International Library of Critical Writings in Economics (Series Editor: Mark Blaug and Adrian Darnell).

"Weak Convergence of Sequential Empirical Processes of Residuals in ARMA Models." *Annals of Statistics*, 22, 2051-2061, 1994.

"On the Partial Sum Processes of Residuals in Autoregressive and Moving Average Models." *Journal of Time Series Analysis*, 14, 247-260, 1993.

Other Publications:

"A New Look at Panel Stationarity Tests and the PPP Hypothesis" (with Serena Ng), in *Identification and Inference for Econometric Models: Essays in Honor of Thomas J. Rothenberg*, Cambridge University Press, edited by D.W.K. Andrews and J.H. Stock, 2005.

"Multiple Structural Changes Models: a Simulation Analysis," (with Pierre Perron). *Econometric Theory and Practice,* D. Corbea, S. Durlauf and B.E. Hansen (eds.), Cambridge University Press, 2006, 212-234.

RECENT WORKING PAPERS

Limit theory for non-stationary panel data, Revised August 2009.

Likelihood approach to small T dynamic panel data models with interactive effects, March 2009, revision December 2010.

Factor analysis and principal components, evaluating commonly used estimation procedures, November, 2010.

A contribution to dynamic panel data analysis, February, 2011.

Inference for FAVAR models under structural restrictions (with Kenpeng Li), Unpublished manuscript, 2012.

Efficient estimation of approximate factors models via regularized maximum likelihood (with Yuan Liao), October, 2012.

Generalized Principal components for panel data and factor models, (with Y. Liao), April 2013

Multifactor asset pricing with a large number of observable risk factors and unobservable common and group-specific factors (with Tomohiro Ando), May, 2013

Panel data models with grouped factor structure under unknown group membership (with Tomohiro Ando), October, 2013

Statistical inference using large estimated covariances for panel data and factor models," (with Yuan Liao) October 2013

Spatial panel data models with common shocks (with Kunpeng Li), revised March 2014.

Dynamic Spatial panel data models with common shocks (with Kunpeng Li), 2015.

Selecting the regularization parameters in high dimensional panel data models: consistency and efficiency (with Tomohiro Ando), 2015

Clustering huge number of financial time series: a panel data approach with high-dimensional predictors and factor structures (with Tomohiro Ando), 2015

Econometric Analysis of Large Factor Models (with Peng Wang), 2015.

CURRENT RESEARCH

Panel Data Analysis, fixed effect, interactive fixed effects;
Instrumental Variable Estimation with Large Number of Instruments;
Forecasting with large number of predictors
High Dimensional Time Series Analysis;
Structural VAR with short-run and long-run restrictions;
Structural VAR with cointegration restrictions
Cross-sectional dependence
Penalized maximum likelihood method, LASSO

PROFESSIONAL ACTIVITIES

Editorial Boards:

1. Associate Editor: *Econometrica*, January 2006-June 2014
2. Associate Editor, *Journal of Econometrics*, April, 2012-
3. Advisory Editor: *Economics Letters*, 2003-present
4. Associate Editor: *Studies of Nonlinear Dynamics and Econometrics*, 2001-present
5. Co-editor: *Annals of Economics and Finance,* 2000-present
6. Associate Editor: *Frontiers of Economics in China, 2012-*
7. Associate Editor*, China Journal of Economics, 2011-*
8. Associate Editor: *Trends and Foundations in Econometrics*, 2004-present.
9. Associate Editor: *Econometric Theory*, 1997-2000

Guest Editor: Journal of Applied Econometrics, "Cross-sectional dependence for panel data"

Guest Editor: Journal of Business and Economic Statistics, "Big Data"

Member of the Scientific Committee of Panel Data Conferences, 2009-present

Conference organizations:

1. Program Committee of Far Eastern Econometric Society Meeting, Beijing, July , 2006
2. Program Committee of Far Eastern Econometric Society Meeting, Taipei, July, 2007
3. Program Committee of Latin American Econometric Society Meeting, Bogota, Columbia, October, 2007
4. Program Committee of Far Eastern Econometric Society Meeting, Singapore, 2008
5. Program Committee of Fourth Symposium of Econometric Theory and Applications, Seoul, Korea, 2008.
6. Program Committee of the 10th World Congress Econometric Society, Shanghai, China, 2010
7. Program Committee of the 18th Panel Data Conference, Paris, France, 2012.
8. Program committee, Tsinghua International Conference in Econometrics, 2009-2014
9. Program Committee of the 6th Society of Financial Econometrics (SoFiE) Conference in Singapore, June, 2013.
10. The Inaugural China Meeting of the Econometric Society, Beijing, June, 2013
11. Large-scale Factor Models in Finance, Society of Financial Econometrics (SoFiE), Lugano, Switzerland, October, 2013
12. Program Committee of the 9th Society of Financial Econometrics (SoFiE) Conference, Hong Kong, June, 14-17, 2016

Referee for:
Econometrica; Journal of Econometrics; Econometric Theory; Review of Financial Studies; Econometric Reviews
Journal of Applied Econometrics; Economics Letters;
Review of Economics and Statistics; Review of Economic Studies
American Economic Review; Rand Journal of Economics
Quarterly Journal of Economics; Journal of Business and Economic Statistics; Journal of the Royal Statistical Society, Series B; Journal of Statistical Planning and Inference; Annals of Institute of Statistical Mathematics; Bernoulli; The Manchester School; Statistics and Probability Letters; Journal of Stochastic Processes and Their Applications; Communications in Statistics: Theory and Methods
Journal of Time Series Analysis; Economic Inquiry;
International Economic Review; Journal of International Money and Finance; Journal of Comparative Economics; National Science Foundation; European Economic Review; Journal of Forecasting;
ESAIM: Probability and Statistics; Annals of Economics and Finance; Studies of Nonlinear Dynamics in Econometrics;
Economic Modeling, Statistica Sinica; Annals of Statistics; Journal of the American Statistical Association; Journal of Financial

Econometrics; International Journal of Forecasting; Quantitative Finance; Computational Economics; Journal of Banking and Finance; Empirical Economics; Economics and Politics; Journal of Money, Credit and Banking; The Scandinavian Journal of Economics; TEST; Journal of Applied Statistics; Review of Accounting and Finance; Journal of Development Economics; American Economic Journal: Macroeconomics; Canadian Journal of Economics; European Journal of Political Economy, Metrika.

SELECTED HONORS, FELLOWSHIPS

Thomson Reuters' *Highly Cited Researchers,* 2014

Fellow, the Econometric Society, 2013.

Fellow, Journal of Econometrics, 2009

Econometric Theory Award, in Recognition of Research Contributions to the Science of Econometrics, 1999.

The *Review of Economic Studies* tour, 1992.

Alfred P. Sloan Foundation Dissertation Fellowship, UC Berkeley, 1991-1992

The Waino Pihl Lecture, Wayne State University, Nov 13, 2015

A keynote speaker at the 31st Annual meeting of Canadian Econometric Study Group, 2014

A keynote speaker at the New York Camp Econometrics, 2014.

An invited speaker at the "Interdisciplinary Speaker Series for the Finance Cluster," NUS Economics Department and the Institute of Real Estate Studies, January 12-17, 2014

A keynote speaker at the Cross-sectional Dependence in Panel Data Models, Cambridge, UK, May 30-31, 2013.

An Invited speaker at The 2012 International Symposium on Econometric Theory and Applications (SETA 2012), Shanghai, China, *May 19-21, 2012*.

Distinguished Visitor, Boston University, April 19-April 22, 2011.

A paired-invited speaker at the Asian Meeting of Econometric Society, August 11 (11-13) 2011, Seoul, Korea.

A keynote speaker at the 16th African Econometric Society Meeting, July 14 (13-15) , 2011, Nairobi, Kenya.

A paired-invited speaker at the 10th World Congress of the Econometric Society, August 2010, Shanghai, China.

A keynote speaker at the 15th International Conference on Panel Data, Bonn, Germany, July 3rd-5th, 2009

An invited speaker at the Far Eastern Econometric Society Meeting, July 11-13, 2007, Taipei, Taiwan

A keynote speaker at the Third Symposium on Econometric Theory and Applications, April 13-15, 2007, Hong Kong

A keynote speaker at the International Conference on Breaks and Persistence in Econometrics, London, Dec 11-12, 2006

A Keynote speaker at the conference "Common Features in London," December 2004.

RECENT CONFERENCES (FROM 2005)

Financial engineering and risk management conference in Shanghai, presenter, July 3-4, 2005,

Econometric Society World Congress, London, August 19-24, 2005.

Columbia Econometrics Colloquium, Columbia University, Presenter, December 3, 2005.

New York Camp Econometrics, Saratogas Spring, Presenter and session chair. February 3-4, 2006.

Conference to Honor the 25th Anniversary of Seminal Research by Stephen Beveridge and Charles R. Nelson, The Federal Reserve Bank of Atlanta, March 31-April 1, 2006.

2006 Conerence on Public Affairs in China, November 18, New York City, presenter.

Greater New York Metropolitan Area Econometrics Colloquium at Yale University, presented "Panel cointegration and global stochastic trends," December 2, 2006.

CIREQ Time Series conference Montreal, Dec 8-9, 2006, presenter

International Conference on Breaks and Persistence in Econometrics, London, Dec 11-12, 2006, keynote speaker

Third Symposium on Econometric Theory and Applications, April 13-15, 2007, Hong Kong, keynote speaker

Far Eastern Econometric Society Meetings, July 11-13, 2007. Taipei, Taiwan, invited speaker and session chair

Bank of England Research Forum: Recent Development in Dynamic Factor Models, Oct 8-10, 2007, invited speaker.

NBER Summer Institute, July 8-July 11， 2008: Conditional Markov Chain and its Application to Economic Time Series

The 2009 Summer Workshop in Econometrics, May 31-June 1, 2009, Tsinghua Beijing. Program committee and session chair

Cowles Foundation Summer Conference in Econometrics, June 22-23, 2009, presenter

The 15th International Conference on Panel Data, July 3- July 5th, Bonn, 2009, keynote speaker

The 10th World Congress of the Econometric Society, August, 2010, Shanghai, China, an invited speaker.

July 14, 2011, A keynote address at the African Econometric Society meetings, Nairobi, Kenya

Aug 10, 2011, An invited talk at the Pre-Conference of AMES, Seoul National University, Seoul, Korea (on The computational Aspects of Dynamic Panel data models with interactive effects")

Aug 11, 2011, A paired-invited talk at the Asian Meetings of Econometric Society, Seoul, Korea (on "A contribution to dynamic panel data models")

May 18, 2012, "2012 Econometrics Workshop," Shanghai University of Economics and Finance, an invited talk on "Identification and estimation of dynamic factor models."

May 19, 2012, The 2012 International Symposium on Econometric

Theory and Applications (SETA 2012) (on Maximum likelihood estimation and inference for approximate factor models of high dimension).

May 30-31, 2013, Cross-sectional Dependence in Panel Data Models, Cambridge, UK, presented "Theory and methods for panel data models with interactive effects"

June 8-9, 2013, The 2013 International Symposium on Analysis of Panel Data, Xiamen, presented "Theory and methods for panel data models with interactive effects"

November 7-8, 2013, CEMMAP Workshop on High-Dimensional Econometric Models, UCL, London, presented "Likelihood approach to dynamic panel data models with interactive effects."

November, 22-23, 2013, Metro-Atlanta Econometric Study Group Meeting (MAESG), Emory University, presented "Statistical inference using large estimated covariances for panel data and factor models"

April 4-6, 2014, New York Camp Econometrics IX, keynote speaker, presented "Spatial panel data models with common shocks."

June 19-22, 2014. North American Summer Meeting of the Econometric Society, Minneapolis. Session chair and presented "Spatial panel data models with common shocks"

July 8-11, 2014. NBER Summer Institute Workshop on Forecasting and Empirical Methods. Presented "Panel data models with grouped factor structure under unknown group membership"

Oct 3-5, 2014, the 31st Annual Meeting of the Canadian Econometrics Study Group, Keynote speaker, presented "Spatial panel data models with common shocks"

June 6-7, 2015, The Fifth Trade and Development Conference: "Trade and Development in the New Normal", presented "Panel data models and factor analysis," Tianjin, China

August 17-23, 2015, the 11th World Congress of Econometric Society, presented "Inference of FAVAR models under structural restrictions," Montreal, Canada

RECENT SEMINAR TALKS (FROM 2005)

April 4, 2005, University of Pennsylvania, presented "Panel data models with interactive fixed effects"

September 16, 2005, Rice University, presented "Panel data models with interactive fixed effects"

October 10, 2005, MIT/Harvard Econometrics Seminar, presented "Panel data models with interactive fixed effects."

June 12, 2006, European Central Bank/CFS/Goethe Frankfurt University Joint Seminar.

June 15, 2006, Malinvaud Seminar at CREST, Paris

June 21, 2006, Cambridge University, U.K.

June 22, 2006, London School of Economics, U.K.

December 13, 2006, Institute of Statistics at Universite Catholique de Louvain, Brussels, Belgium.

October 11, 2007, Queen Mary, University of London, U.K

October 25, 2007, University of Chicago, GSB

March 3, 2008, Stern School of Business, NYU.

March 31, 2009, Indiana University

April 28, 2009, Princeton University, presented "Likelihood approach to small T dynamic panel models with interactive effects"

October 1st, 2009, Harvard/MIT, presented "Likelihood approach to small T dynamic panel models with interactive effects"

March 4th, 2010, Rutgers University, presented "Fixed effects dynamic panel data models, a factor analytical method"

May, 2nd, 2010 Michigan State University, presented "Fixed effects dynamic panel data models, a factor analytical method"

February 9th, 2011, Econometrics Colloquium, Columbia University, presented "Fixed effects dynamic panel data models, a factor analytical method"

April 11, 2011, Boston University, invited as a Distinguished

Visitor, presented "Likelihood approach to small T dynamic panel data models with interactive effects"

September 29, 2011,Triangle Econometrics Seminar, presented "A contribution to dynamic panel data analysis"

October 9, 2012, Brown University, presented "Maximum likelihood estimation and inference for approximate factor models of high dimension"

October 17, 2012, Yale University, presented the same paper as above.

April 26, 2013, Montreal Econometric Series (joint seminar of Concordia, McGill, and Montreal U). Presented the paper "Theory and methods of panel data models with interactive effects."

October 17, 2013, Econometrics workshop at Rochester, presented "Likelihood approach to dynamic panel data models with interactive effects."

October 21, 2013, Maryland University, presented "Likelihood approach to dynamic panel data models with interactive effects."

December 9, 2013, University of Pennsylvania, presented "Likelihood approach to dynamic panel data models with interactive effects."

January 14, 2014, Institute of Real Estate Studies, NUS, presented "Spatial panel data models with common shocks."

January 17, 2014, "Interdisciplinary Speaker Series for the Finance Cluster" at NUS, presented "Likelihood approach to dynamic panel data models with interactive effects."

September 22, 2015, Graduate Center, CUNY, "Large dimensional factor models"

November 13, 2015, Wayne State University, delivered the Waino Pihl Lecture, "Panel data models and factor analysis"

RESEARCH GRANTS

National Science Foundation, SES1658770, 2017-2020
National Science Foundation, SES1357598, 2014-2017
National Science Foundation, SES0962410, 2010-2013

National Science Foundation, SES0551275, 2006-2009
National Science Foundation, SES0137084; SES0424540, 2002-2005
National Science Foundation, SBR9896329, 1999-2001
National Science Foundation, SBR9414083; SBR9709508, 1994-1998
Provost Fund of MIT, 1995
Dean's Faculty Development Fund, MIT, 1993
Provost Fund of MIT, 1992