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Education

Ph.D. Economics, University of Illinois at Urbana-Champaign, 2007.

Dissertation: Essays on Maximum Entropy Principle with Applications to Econometrics and Finance

Committee: Anil K. Bera (chair), Roger Koenker, Zhongjun Qu, and Louis Chan.

M.S. Statistics, University of Illinois at Urbana-Champaign, 2006.

M.S. Economics, University of Illinois at Urbana-Champaign, 2002.

B.A. Economics, Chung-Ang University, 1998.

Employment

Professor, School of Economics, Chung-Ang University, Sep. 2020 - Present.

Associate Professor, School of Business and Management, Department of Economics and Finance, RMIT, Vietnam, Sep. 2019 - Aug. 2020.

Associate Professor, School of Economics, Chung-Ang University, Sep. 2015 - Aug. 2020.

Assistant Professor, School of Economics, Chung-Ang University, Sep. 2013 - Aug. 2015

Assistant Professor, Department of Economics, The Chinese University of Hong Kong, Aug. 2010 - Jul. 2013.

Visiting Assistant Professor, Department of Economics, University of Illinois at Urbana-Champaign, Aug. 2009 - July 2010.

Assistant Professor, The Wang Yanan Institute of Studies in Economics, Xiamen University, Aug. 2007 - July 2009.

Research

Research Interests

Econometrics, Financial Econometrics, Applied Econometrics, Machine Learning, Empirical Finance, Applied Microeconomics, Energy Economics.

Publications

Optimal Portfolio Selection using a Simple Double-Shrinkage Selection Rule (with Young C. Joo), 2021, *Forthcoming*, ***Finance Research Letters***.

Relationship between Household Income and Socio-Political Capital in Rural Vietnam: A Panel Quantile Regression Approach (with Myeong Jun Kim and Tram Nguyen), 2021, *Forthcoming, Applied Economics Letters*.

Causal Relationship among Cryptocurrencies: A Conditional Quantile Approach (with Myeong Jun Kim and Nguyen Phuc Canh), 2020, *Forthcoming, Finance Research Letters*.

On Time and Frequency-varying Okun's Coefficient: A New Approach Based on Ensemble Empirical Model Decomposition (with Myeong Jun Kim and Stanley Ko), 2020, *Forthcoming, Empirical Economics*.

Tail Risk Measures and Portfolio Selection (with Young C. Joo), 2021, *Studies in Computational Intelligence*, 879, 117-139.

Do Gender and Age Matter Time-varying Okun's Law?: Evidence from South Korea (with Myeong Jun Kim), 2018, *Forthcoming, Pacific Economic Review*.

Generalized Empirical Likelihood Specification Test Robust to Local Misspecification (with Haiqi Li and Rui Fan), 2018, *Economics Letters*, 171, 149-153.

Information Theoretic Approaches to Income Density Estimation with an Application on the U.S. Income Data (with Anil Bera), 2018, *Forthcoming, Journal of Economic Inequality*.

Time-varying Investor Herding in Chinese Stock Markets (with Haiqi Li and Ying Liu), 2017, *Forthcoming, International Review of Finance*.

Empirical Conditional Quantile Test for Purchasing Power Parity: Evidence from East Asian Countries (with Wei Ma and Haiqi Li), 2017, *International Review of Economics and Finance*, 49, 211-222.

Asymmetric Relationship between Investors' Sentiment and Stock Returns: Evidence from a Quantile Non-Causality Test (with Haiqi Li and Yu Guo), 2017, *International Review of Finance*, 17(4), 617-626.

Oil Prices and Stock Markets: Does the Effect of Uncertainty Change over Time? (with Young C. Joo), 2017, *Energy Economics*, 61, 42-51.

Crude Oil and Stock Markets: Causal Relationships in Tails? (with Haoyuan Ding and Hyung-Gun Kim), 2016, *Energy Economics*, 59, 58-69.

Optimal Conditional Hedge Ratio: A Simple Shrinkage Estimation Approach (with Myeong Jun Kim), 2016, *Journal of Empirical Finance*, 38, 139-156.

Nonlinear Relationship between Crude Oil Price and Net Futures Positions: A Dynamic Conditional Distribution Approach (with Haiqi Li and Myeong Jun Kim), 2016, *International Review of Financial Analysis*, 44, 217-225.

Testing for a Unit Root in a Non-linear Quantile Autoregression Framework (with Haiqi Li), 2018, *Econometric Reviews*, 37, 867-892.

Estimation and Hedging Effectiveness of Time-Varying Hedge Ratio: Nonparametric Approaches (with Rui Fan and Haiqi Li), 2016, *Journal of Futures Markets*, 36(10), 968-991.

Generalized Cross-spectral Test for Nonlinear Granger Causality with Applications to Money-Output and Price-Volume Relations (with Haiqi Li and Wanling Zhong), 2016, *Economic Modelling*, 52(PB), 661-671.

The Role of Financial Speculation in the Energy Future Markets: A New Time Varying Co-

efficient Approach (with Haiqi Li and Hyung-Gun Kim), 2015, *Economic Modelling*, 51, 112-122.

Asymmetric Laplace Regression: Maximum Likelihood, Maximum Entropy and Quantile Regression (with Anil Bera, Antonio Galvao and Gabriel Montes-Rojas), 2016, *Journal of Econometric Methods*, 5(1), 79-101.

Nonlinear Dependence between Stock and Real Estate Markets in China (Terence Chong and Haoyuan Ding), 2014, *Economics Letters*, 124, 526-529.

Do Net Positions in the Futures Market Cause Spot Prices of Crude Oil? (with Haoyuan Ding and Hyung-Gun Kim), 2014, *Economic Modelling*, 41, 177-190.

A Simple Spatial Dependence Test Robust to Local and Distributional Misspecifications (with Ying Fang and Jinfeng Zhang), 2014, *Economics Letters*, 124, 203-206.

Determinants of Housing Prices in Hong Kong: A Box-Cox Quantile Regression Approach (with H. Kim and K.C. Hung), 2015, *Journal of Real Estate Finance and Economics*, 50, 270-287.

Multivariate Density Forecast Evaluation: A Modified Approach (with Stanley Ko), 2013, *International Journal of Forecasting*, 29, 431-441.

Quantile Autoregressive Distributed Lag Model with an Application to Housing Price Returns (with Antonio Galvao and Gabriel Montes-Rojas), 2013, *Oxford Bulletin of Economics and Statistics*, 75, 307-321.

Resource Abundance and Economic Growth in China (with Rui Fan and Ying Fang), 2012, *China Economic Review*, 23, 704-719.

Money Demand in China and Time-Varying Cointegration (with Haomiao Zuo), 2011, *China Economic Review*, 22, 330-343.

An Estimation of U.S. Gasoline Demand : A Smooth Time-Varying Cointegration Approach (with Guochang Zhao), 2010, *Energy Economics*, 32, 110-120.

Estimation and Hedging Effectiveness of Time-Varying Hedge Ratio: Flexible Bivariate GARCH Approaches (with Sang Y. Jei), 2010, *Journal of Futures Markets*, 30, 71-99.

Maximum Entropy Autoregressive Conditional Heteroskedasticity Model (with Anil K. Bera), 2009, *Journal of Econometrics*, 150, 219-230.

Optimal Portfolio Diversification Using Maximum Entropy Principle (with Anil K. Bera), 2008, *Econometric Reviews*, 27, 484-512.

Other Publications

Dynamic Conditional Relationships between Developed and Emerging Markets (with Wonho Song and Doojin Ryu), 2018, *Physica A*, 507, 534-543.

The Dynamic Conditional Relationship between Stock Market Returns and Implied Volatility (with Doojin Ryu and Jeongseok Song), 2017, *Physica A*, 482, 638-648.

Tourism Development and Economic Growth in Korea: Causal Relationship in Tails (with Sang-Hyuck Kim), 2017, *Tourism Analysis*, 22, 149-165.

Determinants of Systematic Risk in the U.S. Restaurant Industry: A Technical Note (with

Sang-Hyuck Kim), 2016, *Tourism Economics*, 22(3), 621-628.

FDI Outflow, Gravity Theory and Pollution Haven Hypothesis: Evidence from Korea Manufacturing Industry (with ChungAh Kim and Min Kyung Song), 2015. *Journal of Korea Trade*, 19(3), 79-97.

An empirical test for Okun's law using a smooth time-varying parameter approach: evidence from East Asian countries (with Myeong Jun Kim and Sang Y. Jee), 2015, *Applied Economics Letters*, 22(10), 788-795.

A New Robust ARCH Test and YJ-GARCH Model (with Haiqi Li), 2011, *Statistical Research* (In Chinese), 29, 104-109.

Quantile elasticity of international tourism demand for South Korea using the quantile autoregressive distributed lag model (with Haiqi Li and J. Seo), 2011, *Tourism Economics*, 17, 997-1015.

The Determinant of Volatility on International Tourism Demand: An Empirical Note (with Sang Y. Jee), 2010, *Applied Economics Letters*, 17, 217-223.

Interrelationships among Korean Outbound Tourism Demand: Granger Causality Analysis (with J. Seo and S. Boo), 2010, *Tourism Economics*, 3, 597-610.

The Analysis of the Relationships of Korean Outbound Tourism Demands: Jeju Island and Three International Destinations (with J. Seo and Larry Yu), 2009, *Tourism Management*, 30, 530-543.

Financial Data Analysis Using Maximum Entropy Approach (with Anil K. Bera), 2004, *Proceedings of the International Statistical Conference*, pp. 89-106, Sri Lanka (Referred article).

Use of Maximum Entropy Principle to Improve Distributional Assumption in ARCH Models (with Anil K. Bera), 2003, *Proceedings of 2003 Joint Statistical Meeting*, Business and Economic Statistics Section, American Statistical Association.

Working Papers

Jackknife Empirical Likelihood Ratio Dependence Test with Application in Testing Spatial Dependence (with Stanley Ko), 2021

Can Portfolio Diversification using Bitcoin Help? (Young C. Joo), 2021.

Forecasting Stock Returns with Conditional Quantile Level Dependence (with Stanley Ko), 2021

Empirical Test for Energy Intensity Convergence using a Spatial Panel Approach (with Do Young Lee), 2021.

The Impact of Oil Price Volatility on Stock Markets: Evidences from Oil-importing Countries (with Young C. Joo), 2021

Testing for Market Efficiency in Cryptocurrencies: Evidence from a Conditional Quantile Framework (with Myeong Jun Kim), 2021.

A Simple Test for Art Market Efficiency (with Myeong Joon Kim), 2021.

Effects of Natural Disasters on Stock Markets: Empirical Application of Asian Stock Markets

(with Young C. Joo and Stanley Ko), 2021.

A Simple Test for Financial Speculation in the Cryptocurrency Markets (with Myeong Jun Kim and Do Young Lee), 2021

Estimating the relationship between LNG price and crude oil price: The case of Japan and Korea (with Myeong Jun Kim), 2020

Effects of Natural Disasters on Stock Markets: Empirical Application of Asian Stock Markets (with Young C. Joo and Stanley Ko), 2019.

Multivariate Density Forecast Evaluation: Smooth Test Approach (with Stanley Ko), 2020. *Submitted*

Stability of Money Demand in China : Distributional Dynamics Approach (with Yousha Liang and H. Ding), 2016.

Testing for Stock Market Contagion : A Quantile Regression Approach (with Wendun Wang and Naijing Huang), 2015.

Robust Specification Test to Moment Condition Models (with Haiqi Li), 2013.

Generalized Empirical Likelihood Specification Test Robust to Local Misspecification (with Haiqi Li), 2013.

Robust Portfolio Selection and S-shaped Utility (with Zhihuang Shuai), 2013.

Density Forecast Evaluation Using Data-Driven Smooth Test (with Yupeng Zhang), 2012.

The Fisher's Transformation for the Sample Correlation Coefficient: A Revisit (with Anil Bera), 2012.

Estimation of Maximum Entropy Densities with Application to Income Distribution Dynamics, 2004.

Work in Progress

Tail Risk Measure and Volatility Forecast (with Stanley Ko, Steve Lo and Yupei Zhao).

Maximum Entropy Based Test (with Stanley Ko).

Combining Forecast Densities Using Adaptive Mixing Strategy (with Stanley Ko).

Testing for Asymmetry: Location of Mode (with Stanley Ko).

Testing for Instrumental Variable Models under Weak Identification and Local Nonexogeneity (with Rui Fan).

A Unified Test for Linear and Nonlinear Granger Causality via Generalized Cross-Spectrum (with Haiqi Li).

For Better Portfolio Performance: Constrained Covariance Matrix Estimator using Multivariate Skewed-t Distribution (with Young-Chan Joo).

Revisit Forward Rate Unbiasedness Hypothesis : Smooth Time-Varying Parameter Approach (with Myeong Jun Kim).

Maximum Entropy Density Estimation under Inequality Moment Conditions.

A Robust Test of Structural Parameters to Nearly Exogenous Instruments.

Estimating Risk Neutral Densities from Option Prices under Uncertainty: A Maximum Entropy Approach (with Stanley Ko).

Estimation of Conditional Value at Risk Under Regression Quantiles.

Maximum Entropy Based-Test with Implication for Neyman's Smooth Test.

Information Matrix Test for Spatial Error Autoregressive Model (with Anil Bera and Pradosh Simlai).

A Robust Test for Constant Correlation in a Multivariate GARCH Model under Local Misspecification (with Haiqi Li).

Teaching

Big Data and Machine Learning with R, Chung-Ang University, Fall 2018.

Econometrics (Grad), Chung-Ang University, Fall 2015, Fall 2016, Fall 2017, Fall 2018.

Mathematics for Economists (Undergrad), Chung-Ang University, Spring 2014, Spring 2015, Spring 2016, Spring 2017, Spring 2018.

Economic Statistics (Undergrad), Chung-Ang University, Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017.

Public Finance (Undergrad), Chung-Ang University, Spring 2014.

Macroeconomics (Undergrad), Chung-Ang University, Fall 2013, Fall 2014.

Econometric Theory and Applications (Grad), HSBC Business School, Peking University, Spring 2012.

Applied Econometrics (Grad), CUHK, Spring 2012, Spring 2013

Method of Economic Statistics (Undergrad), CUHK, Spring 2012, Spring 2013.

Applied Time Series Analysis (Grad), CUHK, Spring 2011.

Applied Forecasting Method (Undergrad), CUHK, Spring 2011, Fall 2011, Fall 2012.

Econometric Analysis (PhD), University of Illinois, Spring 2010.

Time Series Econometrics (PhD), University of Illinois, Fall 2009.

Introduction to Applied Econometrics (Undergrad), University of Illinois, Fall 2009.

Quantitative Investment Analysis (for the joint program with Singapore Management University), WISE, Xiamen University, Fall 2008.

Advanced Quantitative and Economic Analysis (for the joint program with Singapore Management University), WISE, Xiamen University, Spring 2008.

Econometrics II (Graduate), WISE, Xiamen University, Spring 2008, 2009.

Time Series Econometrics (Graduate), WISE, Xiamen University, Spring 2008, 2009.

Conference and Seminar Presentations

The 2018 Spring Conference: Korean Resource Economics Association, KOEX Conference Room 403, Seoul, Korea, June 8, 2018.

The 2017 International Symposium on Econometric Theory and Applications (SETA 2017), Guanghua School of Management, Peking University, Beijing, China, June 13-14, 2017.

Invited Seminar, Department of Finance and Business Economics, University of Macau, Macau, China, Dec. 14, 2015.

Invited Seminar, The Korea Econometric Study Group, Department of Economics, Sungkyunkwan University, Seoul, Korea, Nov. 27, 2015.

Invited Seminar, Department of Business Statistics and Econometrics, Guanghua School of Management, Peking University, Beijing, China, Apr. 19, 2015.

The 2015 Korea's Allied Economic Association Annual Meeting, Yonsei University, Seoul, Korea, Feb. 24 - 25, 2015.

Invited Lecture, The Institute of Management Research, Kangwon National University, Chuncheon, Korea, Dec. 17, 2014.

The Third International Conference on Futures and Derivative Markets, Shanghai Institute of Futures and Derivatives, Pudong, Shanghai, China, Oct. 30 - Nov. 2, 2014.

The 2014 Summer Meeting The Korea Academic Society of Industrial Organization, Jeju National University, Jeju, Korea, Aug. 22, 2014.

The 2014 Korean Econometric Society, Sol Beach & Resort, Yangyang, Korea, Jun. 27-28, 2014.

The 2014 Annual Meeting The Korean Association of Applied Economics, Chung-Ang University, Seoul, Korea, Apr. 18, 2014.

Invited Seminar, Department of Economics, Kyung Hee University, Korea, Mar. 18, 2014.

The 23rd Annual Meeting of the Midwest Econometrics Group, Indiana University, Bloomington, Indiana, Oct. 25-26, 2013

Invited Seminar, Korea University, Korea, Sep. 27, 2013.

The 2012 Asian Meeting of the Econometric Society, Delhi, India, Dec. 20-22, 2012.

Invited Seminar, Yonsei University, Korea, Sep. 20, 2012.

Invited Seminar, Korea Energy Economics Institute, Korea, Oct. 6, 2011.

The 2011 Asian Meeting of the Econometric Society, Korea University, Seoul, Korea, August 11-13, 2011.

Invited Seminar, Department of Economics, HKUST, Hong Kong, China, Apr. 13, 2011.

Invited Seminar, Antai College of Economics and Management, Shanghai Jiao Tong University, Shanghai, China, Mar. 10, 2011.

Invited Seminar, Wang Yanan Institute for Studies in Economics (WISE), Xiamen University, Xiamen, China, Oct. 14, 2010.

Invited Seminar, The Research Institute of Economics and Management (RIEM), Southwestern University of Finance and Economics, Chengdu, China, Oct. 8, 2010.

The 20th Annual Meeting of the Midwest Econometrics Group, Washing University, St. Louis, Missouri, Oct. 1-2, 2010.

Info-Metrics: Theory and Applications in the Social Sciences, American University, Washington D.C., Sep. 24-25, 2010.

The 10th World Congress of the Econometric Society, Shanghai, China, Aug. 17-21, 2010.

Invited Seminar, Department of Economics and Statistics, Korea University, Korea, July 27, 2010.

The International Symposium on Econometrics of Specification Tests in 30 Years (TEST 2010), WISE, Xiamen University, Xiamen, June 24-25, 2010.

The 19th Annual Meeting of the Midwest Econometrics Group, Purdue University, West Lafayette, Indiana, Sep. 11-12, 2009.

The 2009 Summer Workshop in Econometrics, Tsinghua University, Beijing, China, May 31 - June 1, 2009

The 18th Annual Meeting of the Midwest Econometrics Group, University of Kansas, Lawrence, Kansas, Oct. 17-18, 2008.

Invited Seminar, Department of Finance, Ajou University, Korea, July 9, 2008.

Invited Seminar, Discipline of Econometrics and Business Statistics, University of Sydney, Australia, June 11, 2008.

The 2008 International Symposium on Econometric Theory and Applications (SETA2008), Seoul National University, Korea, May 28-30, 2008.

2008 International Symposium on Recent Developments of Time Series Econometrics, Xiamen University, China, May 10-12, 2008.

Xiamen University - Humboldt University at Berlin Economics & Finance Workshop 2008, Xiamen University, China, Apr. 10-11, 2008.

Cino-Korean Econometrics Workshop 2007, Xiamen University, Dec. 12-13, 2007.

The 17th Annual Meeting of the Midwest Econometrics Group, Saint Louis University, St. Louis, Oct. 12-13, 2007.

The 16th Annual Meeting of the Midwest Econometrics Group, University of Cincinnati, Oct. 6-7, 2006.

Econometrics Lunch Seminar, Department of Economics, UIUC, May 5, 2006.

The 15th Annual Meeting of the Midwest Econometrics Group, Southern Illinois University, Carbondale, Oct. 13-15, 2005.

The Second International Conference on Recent Developments in the Theory, Method and Application of Information and Entropy Econometrics, American University, Washington D.C., Sep. 23-25, 2005.

The 21st Canadian Econometrics Study Group Conference, York University Toronto, Ontario, Canada, Sep. 24-26, 2004.

The 13th Annual Meeting of the Midwest Econometrics Group, University of Missouri, Columbia, Oct. 17-18, 2003.

The First International Conference on Recent Developments in the Theory, Method and Application of Information and Entropy Econometrics, American University, Washington D.C., Sep. 19-21, 2003.

Professional Activities

Editor, *Journal of Economic Development*, Feb. 2016 - Present.

Member, Econometric Society.

Member, American Economic Association.

Member, Korea Econometric Society

Referring,

Academia Economic Papers; Advances in Statistical Analysis; Annals of Regional Science; Applied Stochastic Models in Business and Industry; Applied Economics; Econometric Reviews; Econometric Theory; Econometrica; Economic Modelling; Economics Letters; Emerging Markets Finance and Trade; Empirical Economics; Energies; Energy Economics; Energy Policy; Entropy; European Journal of Finance; Finance Research Letters; Housing, Theory and Society; International Economic Journal; International Journal of Geographical Information Science; International Review of Economics and Finance; International Review of Financial Analysis; Journal of Applied Econometrics; Journal of Business and Economic Statistics; Journal of Econometrics; Journal of Economic Development; Journal of Economic Theory and Econometrics; Journal of Futures Market; Journal of Mathematical Modelling and Algorithms; Journal of Statistical Computation and Simulation; Journal of Sustainable Tourism; Journal of Population Economics; Journal of Real Estate Economics and Finance; Manchester School; Pacific-Basin Finance Journal; Probabilistic Engineering Mechanics; Physica; Quantitative Finance; Quarterly Review of Economics and Finance; Studies in Nonlinear Dynamics & Econometrics; Sustainability; Tourism Economics; Tourism Management.

Honors, Awards, & Fellowships

The National Research Foundation of Korea Grant, The Korean Government (NRF- 2014S1A5A8019628), 2014-2015.

Direct Grant Award (3), CUHK, 2010, 2011, 2012.

List of Teachers Rated as Excellent, UIUC, Spring 2005; Fall 2006.

Hans Brems Best Research Paper Award (honorable mention), Department of Economics, UIUC, May 2005.

Hans Brems Best Research Paper Award, Department of Economics, UIUC, May 2003.

Conference Travel Grant Award, Department of Economics, UIUC, Sep. 2005; Oct. 2005; Oct. 2006.

Graduate College Conference Travel Grant Award, UIUC, Oct. 2003; Sep. 2004; Oct. 2005; Oct. 2006.

Information and Entropy Econometrics (IEE) Conference Grant Award, American University, Sep. 2005.

REFERENCES

Anil K. Bera

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