Aaron Kim

김 영 신

Assistant Professor College of Business Stony Brook University
Adjunct Assistant Professor Applied Mathematics & Statistics, Stony Brook University

RESEARCH AREAS

Mathematics & Statistics

TEACHING AREAS

Mathematics & Statistics

EDUCATION

- Ph.D. in Mathematics, Department of Mathematics, Sogang University, Seoul, South Korea, August 2005, Dissertation: "The modified tempered stable processes with applications to finance."
- Complete Habilitation process (post doctorial lecturer qualification) in Finance and Statistics, School of Economics and Business Engineering, Karlsruhe Institute of Technology (KIT), Germany, October 19, 2011, Dissertation: "Tempered Stable Models and Finance"

EXPERIENCE

(2013.8–Present) Assistant Professor, College of Business, Stony Brook University
(2014.3–present) Adjunct Assistant Professor in Applied Mathematics & Statistics, Stony Brook University
(2011.10–2013.6) Privatdozent (Lecturer) at the School of Economics and Business Engineering, KIT, Germany.
(2007.4–2011.10) Akademischen Mitarbeiter (Academic Staff) at the School of Economics and Business Engineering, KIT, Germany.
(2006.1–2011.10) Post-graduate Student in Department of Statistics, Econometrics and Mathematical Finance, School of Economics and Business Engineering, KIT, Germany
(2005.9–2005.12) Part time lecturer in college of business administration, Ajou University, South Korea
(2003.3–2005.12) Part time lecturer in Department of mathematics, Sogang University, South Korea

BOOK

S. T. Rachev, Y. S. Kim, M. L. Bianchi, and F. J. Fabozzi (2011), Financial Models with Levy Processes and Volatility Clustering, John Wiley & Sons

PATENT

System And Method For Estimating Portfolio Risk Using An Infinitely Divisible Distribution (US8301537 B1)

REFEREED ARTICLES

- H. Fallahgoul, Y. S. Kim, F. J. Fabozzi , J. Park (2019), Quanto Option Pricing with Lévy Models, Computational Economics, 53 (3), 1279–1308
- Y. S. Kim, D. Jiang, S. Stoyanov, (2019) Fractional Levy processes and option pricing, to appear Journal of Derivatives.
- T. Kurosaki, Kim, Y. S. (2018) Foster-Hart optimization for currency portfolio. To appear. Studies in Nonlinear Dynamics & Econometrics. DOI: https://doi.org/10.1515/snde-2017-0119
- Y.S. Kim (2018), Tempered Stable Process, First Passage Time, and Path-dependent Option Pricing, To appear Computational Management Science, DOI: 10.1007/s10287-018-0326-9
- S. V. Stoyanov, Y. S. Kim, S. T. Rachev and F. J. Fabozzi (2018), Enhancing Binomial and Trinomial Equity Option Pricing Models, To appear Finance Research Letters. https://doi.org/10.1016/j.frl.2018.04. 022
- Y. S. Kim, S. V. Stoyanov, S. T. Rachev and F. J. Fabozzi (2018), Another Look at the Ho–Lee Bond Option Pricing Model, The Journal of Derivatives, 25 (4) 48-53
- S. I., Kim, Y. S. Kim, (2018), Tempered stable structural model in pricing credit spread and credit default swap, Review of Derivatives Research, 21 (1), 119-148.
- A. Anand, T. Li, T. Kurosaki, Y. S. Kim (2017), The equity risk posed by the too-big-to-fail banks: A Foster-Hart estimation, Annals of Operations Research, 253 (1), 21–41
- Y. S. Kim (2016), Long-Range Dependence in the Risk-Neutral Measure for the Market on Lehman Brothers Collapse, Applied Mathematical Finance 23(4), 309-322.
- Y. S. Kim, S. Stoyanov, S. Rachev, F. Fabozzi (2016), Multi-purpose binomial model: Fitting all moments to the underlying geometric Brownian motion, Economics Letters 145, 225–229
- A. Anand, T. Li, T. Kurosaki, Y. S. Kim (2016), Foster-Hart Optimal Portfolios Journal of Banking & Finance 68, 117–130
- X. Shi, Zhang L. and Kim Y.S.A. (2016) A Markov Chain Approximation for American Option Pricing in Tempered Stable-GARCH Models. Front. Appl. Math. Stat. 1:13. doi: 10.3389/fams.2015.00013
- H. Fallahgoul, Y. S. Kim, F. J. Fabozzi (2016), Elliptical Tempered Stable Distribution, Quantitative Finance, 16, (7), 1069-1087, doi :10.1080/14697688.2015.1111522
- Y.S. Kim, J. Lee, S. Mittnik, J. Park (2015), Quanto option pricing in the presence of fat tails and asymmetric dependence, Journal of Econometrics, 187, (2), 512–520, doi :10.1016/j.jeconom.2015. 02.035
- J. Choi, Y. S. Kim, I. Mitov (2015), Reward-risk momentum strategies using classical tempered stable distribution, Journal of Banking & Finance 58, 194-213
- K. Georgiev, Y.S. Kim, S. Stoyanov (2015), Periodic Portfolio Revision with Transaction Costs, Mathematical Methods of Operations Research, 81 (3), 337-359
- Y.S. Kim (2015), Multivariate Tempered Stable Model with Long-range Dependence and Time-varying Volatility, Frontiers in Applied Mathematics and Statistics, 1(1). doi: 10.3389/fams.2015.00001
- J. Goode, Y.S. Kim, F. J. Fabozzi (2015), Full versus Quasi MLE for ARMA-GARCH Models With Infinitely Divisible Innovations, Applied Economics incorporating Applied Financial Economics, 47 (48), 5147-5158
- N. Tsuchida, R. Giacometti, F. J. Fabozzi, Y. S. Kim, R.J. Frey (2014), Time Series and Copula Dependency

REFEREED ARTICLES

Analysis for Eurozone Sovereign Bond Returns, Journal of Fixed Income, 24 (1), 75-87

- M. Bekri, Y. S. Kim, S. T. Rachev (2014) Tempered stable models for Islamic finance asset management, International Journal of Islamic and Middle Eastern Finance and Management, 7(1), 37– 60
- T. Zaevski, Y. S. Kim, R. Denchev, F. J. Fabozzi (2014), Stochastic Volatility models for option pricing with Lévy jump behavior: tempered stable estimation. International Review of Financial Analysis, 31, 101-108
- Y. S. Kim, D. Volkmann (2013), Normal Tempered Stable Copula, Applied Mathematics Letters, 26(7), 676-680
- H. Fallahgoul, S. M. Hashemiparast, F. J. Fabozzi, Y. S. Kim (2013), Multivariate Stable Distributions and Generating Densities, Applied Mathematics Letters, 26 (3), 324–329.
- A. Beck, Y. S. Kim, S. T. Rachev, M. Feindt, F. J. Fabozzi (2013), Empirical analysis of ARMA-GARCH models in market risk estimation on high-frequency U.S. data, Studies in Nonlinear Dynamics & Econometrics, 17 (2), 167–177
- T. Kurosaki, Y. S. Kim (2013), Systematic Risk Measurement in the Global Banking Stock Market with Time Series Analysis and CoVaR, Investment Management and Financial Innovations, 10(1), 184-196
- T. Kurosaki, Y. S. Kim (2013), Mean-CoAVaR Optimization for Global Banking Portfolio, Investment Management and Financial Innovations, 10(2), 15-20
- S. Klingler, Y. S. Kim, F. J. Fabozzi, S. T. Rachev (2013) Option pricing with time-changed Lévy processes, Applied Financial Economics, 23 (15), 1231-1238
- K. Milanov, O. Kounchev, F. J. Fabozzi, Y. S. Kim, S. T. Rachev (2013), A Binomial-Tree Model for Convertible Bond Pricing, The Journal of Fixed Income, Vol. 22, No. 3: pp. 79-94
- Y. S. Kim, R. Giacometti, S. T. Rachev, F. J. Fabozzi, D. Mignacca (2012), Measuring financial risk and portfolio optimization with a non-Gaussian multivariate model, Annals of Operations Research, 201(1), 325-343
- Y. S. Kim (2012), Fractional Multivariate Normal Tempered Stable Process, Applied Mathematics Letters, 25 (12), 2396–2401.
- Y. S. Kim, F. J. Fabozzi, Z. Lin, and S. T. Rachev (2012), Option pricing and hedging under a stochastic volatility Levy process model, Review of Derivatives Research, 15 (1), 81-97.
- H. Fallahgoul, S. M. Hashemiparast, Y. S. Kim, S. T. Rachev, F. J. Fabozzi (2012), Approximation of Stable and Geometric Stable Distribution, Journal of Statistical and Econometric Methods, 1(3), 97-123.
- M. Scherer, S. T. Rachev, Y.S. Kim, and F, J. Fabozzi (2012), Approximation of skewed and leptokurtic return distributions, Applied Financial Economics 22 (16), 1305-1316.
- Y. S. Kim, S. T. Rachev, M. L. Bianchi, I. Mitov and F. J. Fabozzi (2011), Time series analysis for financial market meltdowns, Journal of Banking & Finance, 35, 1879–1891.
- Y. S. Kim, S. T. Rachev, M. L. Bianchi, and F. J. Fabozzi (2010), Tempered stable and tempered infinitely divisible GARCH models, Journal of Banking & Finance, 34, 2096–2109.
- M. L. Bianchi, S. T. Rachev, Y. S. Kim, and F. J. Fabozzi (2010), Tempered infinitely divisible distributions and processes, Theory of Probability and Its Applications, 55 (1), 58-86.
- Y. S. Kim, S. T. Rachev, M. L. Bianchi, and F. J. Fabozzi (2010), Computing VaR and AVaR in infinitely divisible distributions, Probability and Mathematical Statistics, 30 (2), 223-245.
- Y. S. Kim, S. T. Rachev, D. M. Chung, and M. L. Bianchi (2009), The modified tempered stable distribution, GARCH models and option pricing, Probability and Mathematical Statistics, 29 (1), 91-117.
- G. K. Mitov, S. T. Rachev, Y. S. Kim, and F. J. Fabozzi (2009), Barrier option pricing by branching processes, International Journal of Theoretical & Applied Finance, 12 (7), 1055-1073.

REFEREED ARTICLES

- Y. S. Kim, S. T. Rachev, M. L. Bianchi, and F. J. Fabozzi (2008), Financial market models with Levy processes and time-varying volatility, Journal of Banking & Finance, 32 (7), 1363-1378.
- Y. S. Kim and J. H. Lee (2007), The relative entropy in CGMY Processes and its applications to finance, Mathematical Methods of Operations Research, 66 (2), 327-338.

CHAPTERS IN BOOKS

- M. L. Bianchi, S. T. Rachev, Y. S. Kim, and F. J. Fabozzi (2010), Tempered stable distributions and processes in finance: numerical analysis. In M. Corazza and C. Pizzi (Eds.), Mathematical and Statistical Methods for Actuarial Sciences and Finance, Springer.
- Y. S. Kim, S. T. Rachev, D. M. Chung, and M. L. Bianchi (2008), A modified tempered stable distribution with volatility clustering. In J. O. Soares, J. P. Pina, and M. Catalao-Lopes (Eds.), New Developments in Financial Modelling, Cambridge Scholars Publishing
- Y. S. Kim, S. T. Rachev, M. L. Bianchi, and F. J. Fabozzi (2007), A new tempered stable distribution and its application to finance. In Bol G., Rachev S. T., and Wuerth R., editors, Risk Assessment: Decisions in Banking and Finance, 51-84, Physika Verlag, Springer.

WORKING PAPERS

- Kim, Y. S., Li, T., Zhu, F. Too conservative to win? On the Aumann-Serrano index of riskiness with application to portfolio optimization. (Journal Article, Working Paper).
- Zhu, F., Bianchi, M. L., Kim, Y. S., Fabozzi, F. J., Wu, H. Option Valuation for Infinitely Divisible GARCH Models: A Sequential Bayesian Learning Approach. (Journal Article, Working Paper).
- Kim, S. I., Kim, Y. A. Tempered Stable Factor Copula Model and Synthetic Collateralized Debt Obligation (CDO) Pricing. (Journal Article, Submitted).

PRESENTATIONS

“Stochastic Covariance model, application to option pricing.,” International Conference on Mathematical Finance & Symposium on the Role of Mathematical Finance on FinTech Business, National Institute for Mathematical Sciences (NIMS) and National Research Foundation of Korea (NRF), Seoul, South Korea. (August 7, 2018).

“First Passage Time for Tempered Stable Process and Its Application to Derivatives Pricing," Financial Mathematics Seminar, Sookmyung University and NRF, Seoul, South Korea. (June 16, 2017).

“Long and Short Memory in the Risk-neutral Pricing Process," (Joint work with S. Stoyanov, and Jiang, D.), Computational Management Science 2017, University of Bergamo, Georgia Institute of Technology and CMS Journal, University of Bergamo, Bergamo, Italy. (May 30, 2017).

“Risk Management in High Frequency Trading," Zarb Analytics Initiatives III, Zarb Business School, Hofstra

PRESENTATIONS

Univeristy, NY, United States. (March 31, 2017).

"The first hitting time of Levy process and its application to Barrier option pricing", Center for Finance Seminar Series, Stony Brook University (Sep 13, 2016)

"Fractional Lévy Process and Option Pricing " (Joint work with S. Stoyanov), Conference On Quantitative Methods For Financial Regulation, Stony Brook (Sep 10, 2016)

"Risk Management in High Frequency Trading," (joint work with Glimm, J. (Presenter), Stoyanov, S., Rachev, S., Lim, H.), Conference on Quantitative Method for Financial Regulation, Labex REFI and Stony Brook University, NYC and Stony Brook, NY, United States. (September 11, 2016).

"Fractional Lévy Process and Option Pricing " (Joint work with S. Stoyanov), Bachelier Finance Society, 9th World Congress, New York (July 18, 2016)

"Normal Tempered Stable Firm Value Model" (joint work with S. I. Kim), QF Seminar Series, Stony Brook University (April 19, 2016)

"Fractional Levy Process and Option Pricing" (joint work with S. Stoyanov), Center for Finance Seminar Series, Stony Brook University (March 11, 2016)

"Foster-Hart Risk and the Too-big-to-Fail Banks" (joint work with A. Anand, T. Li, and T. Kurosaki), International Conference on Game Theory, Stony Brook Center For Game Theory (July 20, 2015)

"Long-Range Dependence in the Risk-Neutral Measure for the Market on Lehman Brothers Collapse", ECares Brussels Belgium, Invited talk (March 19, 2015)

"Multivariate Fractional Levy Model with Time varying volatility", (joint work with J. Glimm, and S.T. Rachev), JSM 2014 in Boston- Risk Management in Financial Markets, Invited talk, (Aug 4, 2014)

"Multivariate Normal Tempered Stable Distribution", University of Bergamo (June 18, 2012)

"SUNY Korea Financial Engineering Seminar - Market Crashes and Modeling Volatile Markets", SUNY Korea (Jan. 12~ Jan. 14, 2012)

"Market Crashes and Modeling Volatile Markets", Sookmyung Women's University, Korea (Jan. 4, 2012)

"VAR And AVAR in Fat-Tailed Market Model", University Complutense de Madrid, Spain (Oct. 5, 2010)

"Market Crashes and Modeling Volatile Markets", KIAS, Korea (Aug. 3-5, 2010)

"Option Pricing with Regime-Switching Tempered Stable Processes", 34th Annual Conference of the German Classification Society, Karlsruhe (Jul. 21 -23, 2010)

"VAR And AVAR in Fat-Tailed Market Model", VIIIth International Summer School on "Risk Measurement and Control", Rome (Jul. 5-9, 2010)

"Stable and Tempered Stable Distributions and Processes", ASMDA2009, Vilnius Lithuania (June 29 – July 3, 2009)

"Market Crashes and Modeling Volatile Markets", 11th Symposium on Finance, Banking, and Insurance, Universität Karlsruhe (TH), Germany (Dec. 17 - 19, 2008)

"Market Crashes and Modeling Volatile Markets", the International Summer School in Risk Measurement and Control 2008, Rome, Italy (Jul. 1, 2008), together with S. T. Rachev and Michele-Leonardo Bianchi.

"Option Valuation with a New Tempered Stable GARCH Model", the 41th Meeting of EURO Working Group on Financial Modelling, Lisboa, Portugal (Nov. 2007)

"A New Tempered Stable Distribution with Applications to Finance", the 40th Meeting of EURO Working Group on Financial Modelling, Rotterdam, The Netherlands (May. 2007)

"The Modified tempered Stable Distribution, GARCH-Models and Option Pricing", the 4th World Congress of the Bachelier Finance Society, Tokyo, Japan (Aug. 2006)

PRESENTATIONS

"The Modified Tempered Stable Processes with Application to Finance", Series lecture in Statistical Research Center for Complex System, Seoul National University, (Sep. 2005)