JUNWEN LU

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2019 (expected)
   Dissertation Title: *Essays on Option Market and Risk Neutral Density*
   Dissertation Committee: Zhongjun Qu, Pierre Perron, Hiroaki Kaido

M.A., Political Economy, Boston University, Boston MA, September 2015

B.S., Mathematics and Economics, Pennsylvania State University, State College, PA, 2012

FIELDS OF INTEREST

Financial Econometrics, Finance, Time Series

WORK IN PROGRESS

"Sieve Estimation of Option Implied State Price Density," (with Zhongjun Qu)
"Model Specification and Volatility Risk Premium from S&P 500 Option Market"
"Bivariate Risk Neutral Density"

PRESENTATIONS

NBER-NSF Time Series Conference (Poster Session), Evanston, IL, 2017
BU-BC Green Line Econometrics Seminar, Boston MA, 2017

FELLOWSHIPS AND AWARDS

Summer Research Grant, Department of Economics, Boston University, 2015

WORK EXPERIENCE

Quantextual Research Intern, State Street Corporation, Fall 2018
Research Assistant, Department of Economics, Boston University, Fall 2017

TEACHING EXPERIENCE

Instructor, Empirical Economic Analysis, Department of Economics, Boston University,
   Spring 2018
Teaching Fellow, Introductory Macroeconomics, Department of Economics, Boston
   University, Spring 2017
Teaching Assistant, Advanced Econometrics (PhD level), Department of Economics, Boston
   University, Fall 2016

COMPUTER SKILLS & CERTIFICATES

Python, R, MATLAB, STATA, LaTeX, Parallel Computing, CFA Level 1

IMMIGRATION STATUS

Chinese citizen, US permanent resident

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Sieve Estimation of Option Implied State Price Density *(with Zhongjun Qu)*

A state price density specifies a probability distribution under which the rates of returns on relevant financial securities equal the risk free rate. The density embodies rich information about the market's expectations and risk attitudes. This paper develops a nonparametric procedure for estimating this density using a single cross section of both put and call option prices. The key step of the implementation can be described as estimating a constrained linear least square regression. For the technical analysis, the complications are that the estimator is characterized by an inverse problem of an integral equation and that the integral operator is unbounded. These complications are tackled by exploiting the structure of the option pricing problem. We study the rate of convergence and the sampling distribution of the estimator. The estimator is then applied to study the S&P500 and VIX options using daily as well as intradaily data.

Model Specification and Volatility Risk Premium from S&P 500 Option Market

This paper examines the out-of-sample option pricing performance for various affine stochastic volatility models using both S&P 500 index and option data. In particular, I consider a two volatility-factor model and investigate its ability to match the time-varying level and slope of the volatility smirk. To exploit the information from both stock returns and option prices, I first use MCMC method for estimation under the physical measure, and then calibrate the model parameters under the risk-neutral measure using options. I find that the two volatility-factor model outperform other models in the long-term horizon.