Linxi Chen

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Education

Ph.D. in Economics	Duke University, 2018
M.A. in Economics	Duke University, 2012
B.A. in Economics	Sun Yat-sen University, 2010
Exchange Student	The University of Hong Kong, 2008

Specialty

Factor Models, Applied Time Series Econometrics, Bayesian Modeling, Computational Economics, Macroeconomics

Skills

Analytical: Model Building, Optimization, Dynamic Programming, Numerical Methods for Nonlinear System, Time Series Econometrics, Cross-sectional Econometrics, Bayesian Statistics, Factor Models, Kalman Filtering
Programming: Python (Pandas, Scikit-learn, Numpy, cvxpy, statsmodels, pymc3, JAX, torch), CUDA/Thrust, MATLAB, UNIX/Linux, LaTeX
Computing: Cluster Maintenance, Docker, Git Version Control, Vim, Emacs, Parallel Computing with GPU
Language: English (fluent), Mandarin (native), Cantonese (native)

Professional Experience

Capital Group — **Solution Analyst**
Capital Solution Group — New York, June 2023–Present

- Productionize multi-objective optimization engine
- Enhancing and deepening quantitative research and methods within Capital Solution Group
- Maintaining and developing quantitative research infrastructure and production process

BlackRock — **Quant Researcher, Vice President**
Financial Modeling Group — New York, July 2018–June 2023

- Collaborated with multi-asset investment teams on implementation of my research on Bayesian Index+Factor+Alpha asset allocation framework (see publication section)
- Collaborated to conduct research on demand-based asset pricing focusing on impact of increasing preference for ESG
- Spearheaded the effort to upgrade BlackRock's firmwide Capital Market Assumption 3.0 framework for strategic asset allocation and scenario analysis purposes
- Spearheaded research on structural mortgage behavior model based on Sparse Grid Dynamic Programming
- Led the update of a FAVAR-based macro model with machine learning techniques
- Optimal glide-path design for pension funds using dynamic programming
- Led six factor models in the Economic Scenario Simulation project through development, productionization, validation, and deployment stages
  - Develop arbitrage-free Nelson-Siegel Model for yield curve risk factors
  - Developed FX factor model based on common risk factors (carry and momentum)

  - Supported development of inflation term-structure model and commodity term-structure model
- Implemented and productionized a Factor-Augumented Vector Autoregression model for macroeconomic scenario simulation
- Supervised and deployed modular model implementation via Scikit-Learn pipelines
- Maintained Docker image for research and production Python environment
- Provided C++ prototype for a specialized Kalman filter implementation

International Monetary Fund **Fund Internship Program**
Asia and Pacific Department Washington D.C., Jun 2017–Aug 2017

- Led a project to quantify effects of China's supply-side structural reforms (SSSR)
- Applied cross-sector econometric analyses to evaluate the SSSR's contribution to China's PPI reflation since early 2016
- Performed variable reduction for aggregate variables using Principal Component Analysis

Deutsche Bank **Assistant Researcher**
Global Market Division Hong Kong, Aug 2009–Nov 2009

- Analyzed recovery of Chinese industries from the 2007 financial crisis
- Conducted independent research on the deleveraging of U.S. households

Research Experience

Ph.D. Dissertation Research (Duke University)

- Developed a new macroeconomic model to explain why inventory investment explains much more GDP movements in recessions than expansions
- Established new methods to diagnose the underlying state of economy using a nonlinear vector autoregression of inventory and other aggregate variables
- Built a heterogeneous agents model to explain why U.S. firms' investment becomes more lumpy when the relative price of investment good rises

Research Assistant

- *Prof. Cosmin Ilut* (Duke Economics) Aug 2015–May 2016
  - Developed an algorithm to solve a heterogeneous agents model with ambiguity averse firms and information friction
- *Prof. Juan Rubio-Ramirez* (Duke Economics) May 2013–May 2015
  - Developed C++ code for solving the Markov-switching Value Function Iteration problem using graphic processing units (GPUs)
  - Developed an algorithm for the Particle Filter commonly used in statistical evaluations of nonlinear macroeconomic models
  - Applied nonlinear solution methods to models with financial frictions in the form of occasionally binding constraints
  - Investigated the accuracy of nonlinear solutions to a class of models focusing on fiscal multipliers
- *Prof. Daniel Xu* (Duke Economics) May 2013–Aug 2013
  - Drafted the technical appendix on Bayesian econometric methods for a publication
  - Summarized recent advancements in economic forecasting
- *Prof. Daniel Chen* (Duke Law School) Mar 2011–Sep 2011

- Implemented the LASSO method to select the best instrumental variable for Belloni, Chen, Chernozhukov, Hansen (2011)
- Implemented bootstrapping methods to obtain adjusted standard errors in a regression analysis on the CPS dataset
- Merged and matched federal judges' biographical data from the FJC dataset and the Auburn dataset.

Research Papers

- ***Index + Factor + Alpha*** *with* Andrew Ang, Michael Gates, and Paul Henderson (Financial Analyst Journal, 2021-Q4)
- ***Quantifying China's Supply-Side Structural Reform*** *with* Ding Ding, Rui Mano (IMF Working Paper Series)
- ***(Job Market Paper) Asymmetric Inventory Dynamics and Product Market Search***
- ***What Does Inventory Tell Us About Business Cycle Regimes? Evidence from a Markov-switching Vector Autoregression***
- ***Investment Lumpiness and Investment Goods Price*** *with* Yang (Jack) Yu