Michael Cai

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GitHub: www.github.com/caimichael

Education

Aug. 2019 - Ongoing **Ph.D in Economics**, *Northwestern University*, Weinberg College of Arts and Sciences.

Aug. 2013 - Jun. 2017 **B.S. in Business Economics, minor in Mathematics**, *New York University*, Stern School of Business, graduated summa cum laude.

Published Papers

Sept. 2020 **Online Estimation of DSGE Models**, *The Econometrics Journal*, Joint with Marco Del Negro, Edward Herbst, Ethan Matlin, Reca Sarfati, and Frank Schorfheide.

This paper illustrates the usefulness of sequential Monte Carlo (SMC) methods in approximating DSGE model posterior distributions. We show how the tempering schedule can be chosen adaptively, explore the benefits of generalized data tempering for "online" or "real-time" estimation, and provide examples of multimodal posteriors that are well captured by SMC methods. We then use the online estimation of theDSGE model to compute pseudo-out-of-sample density forecasts and document the benefits of conditioning DSGE model forecasts on nowcasts of macroeconomic variables and interest rate expectations pre and post Great Recession and we compare the predictive performance of DSGE models based on "standard" and more diffuse prior distributions.

Oct. 2019 **DSGE Forecasts of the Lost Recovery**, *International Journal of Forecasting*, Joint with Marco Del Negro, Marc Giannoni, Abhi Gupta, Pearl Li, and Erica Moszkowski.

The years following the Great Recession were challenging for forecasters. Unlike other deep downturns, this recession was not followed by a swift recovery, but generated a sizable and persistent output gap that was not accompanied by deflation as a traditional Phillips curve relationship would have predicted. Moreover, the zero lower bound and unconventional monetary policy generated an unprecedented policy environment. We document the real real-time forecasting performance of the New York Fed dynamic stochastic general equilibrium (DSGE) model during this period and explain the results using the pseudo real-time forecasting performance results from a battery of DSGE models. We find the New York Fed DSGE model's forecasting accuracy to be comparable to that of private forecasters and notably better, for output growth, than the median forecasts from the Federal Open Market Committee's Summary of Economic Projections. The model's financial frictions were key in obtaining these results, as they implied a slow recovery following the financial crisis.

Research and Teaching Experience

Jul. 2020 - Ongoing **Research Assistant**, *Northwestern University*, Weinberg College of Arts and Science, Matt Rognlie.

Jul. 2016 - Jul. 2019 **Research Analyst**, *Federal Reserve Bank of New York*, Macroeconomic and Monetary Studies, Dynamic Stochastic General Equilibrium (DSGE) Group.

Fall 2016 - Summer 2017 **Research Assistant**, *New York University*, College of Arts and Science, Professors Tim Christensen and Dave Backus.

Fall 2015 **Research Assistant**, *New York University*, Stern School of Business and Marron Institute of Urban Management, Professor Paul Romer.

Speaking and Presentations

July 2018 **Estimating Non-Linear Macroeconomic Models at the New York Fed**, *JuliaCon 2018*, University College of London.

Honors and Grants

Mar. 2019 **XSEDE Research Allocation—XRAC SES190003**, *Estimating Heterogeneous Agent Dynamic Stochastic General Equilibrium (DSGE) Models using Sequential Monte Carlo*.
295,000 SUs (core-hour equivalents)

May 2017 **Beta Gamma Sigma Honors Society**, *New York University*, Stern School of Business.

May 2017 **Award for Academic Excellence in Economics**, *New York University*, Stern School of Business.
Given to a single student in the undergraduate college

Technologies

- **Programming Languages/Typesetting** Python, Julia, MATLAB, R, LaTeX.
- **Operating Systems** Linux/Unix, OS X
- **Clusters/Cloud** Quest (Northwestern), Bridges PSC (XSEDE), Indiana/TACC Jetstream (XSEDE), Amazon EC2

Last updated: September 25, 2020