Eric Qian

Education

New York University

Non-Degree Student, 2018–2019

Relevant coursework: Masters Stochastic Calculus, Masters Scientific Computing

University of North Carolina at Chapel Hill

B.S. in Mathematics and B.S. in Statistics & Analytics (highest distinction), 2014–2018

Cumulative GPA: 3.88/4.0

Thesis: *Nowcasting Indian GDP with Google Search data* (highest honors)

Relevant coursework: Real Analysis, Complex Analysis, Modern Algebra, Topology, Probability, Stochastic Modeling, Introduction to Optimization, Simulation, Statistical Methods I, Honors Differential Equations, Discrete Mathematics, Mathematical Modeling, Multivariable Calculus

Duke University

Minor in Economics (dual enrollment under Robertson Scholars Program), 2014–2018

Note: Duke courses appear on UNC transcript as ROBT 100 and count toward cumulative UNC GPA

Relevant coursework: PhD Econometrics I, PhD Econometrics II, Mathematical Statistics, Linear Algebra, Machine Learning & Data Mining, Statistical Computing, Introduction to Econometrics, Urban Economics, Intermediate Microeconomics I, Intermediate Microeconomics II, Intermediate Macroeconomics

Research Positions

Research Analyst, Federal Reserve Bank of New York

Macroeconomic and Monetary Studies Function (Time Series Analysis Team), 2018 –

Summer Analyst, Federal Reserve Bank of New York

Macroeconomic and Monetary Studies Function (Time Series Analysis Team), 2017

Junior Visiting Scholar, Oxford University

RA for Francesco Billari, 2016 –

Duke University

RA for Peter Arcidiacono, 2016 – 2018

Coauthored Publications and Ongoing Projects

Nowcasting the Great Recession with Patrick Adams, Domenico Giannone, Argia Sbordone, and Mihir Trivedi. Forthcoming chapter in *Alternative Economic Indicators* (2019).

In this chapter, we use vintage data to assess the forecasting accuracy of GDP growth predictions from the New York Fed Staff Nowcast, a dynamic factor model with Kalman filtering methods. Then, we construct a counterfactual exercise assessing how data delays similar to those from the 2019 partial federal government shutdown affect the ability to monitor macroeconomic conditions. After simulating similar patterns of data scarcity for past quarters, we find that the releases unaffected by the shutdown provide ample information for generating accurate predictions.

A Large Bayesian VAR of the U.S. Economy with Richard Crump, Stefano Eusepi, Domenico Giannone and Argia Sbordone. Mimeo (2019).

We use a large 29-variable Bayesian Vector Autoregressive model to study fiscal and monetary policy questions. We begin by estimating the effect of the 2017 Tax Cut and Jobs Act on macro-financial conditions by simulating the counterfactual path of cyclically-adjusted tax revenue. In another exercise, we examine the predictability of exchange rates by conditioning on the future paths of oil price, commodity price, and interest rate. We conclude by constructing a vintage dataset to assess the model's forecasting performance in real-time and find that it performs comparably to common statistical benchmarks. We plan to submit a draft to *Advances in Econometrics: Bayesian Macroeconometric Modelling* in late December.

Nowcasting Indian GDP with Google Search data. UNC-Chapel Hill Department of Statistics and Operations Research Senior Honors Thesis. Carolina Digital Repository (2019).

Constructing a dynamic factor model with economic and financial indicators, I tested whether including Google Trends data could improve Indian GDP forecasts by providing an early signal for consumption patterns. Considering the quality of traditional sources, I found that Google Trends data failed to improve forecasting performance. I received highest honors for the project.

Noise Complaints and School Performance: Evidence From New York City. Population Association of America "Race, Education and Neighborhoods" session (2017).

I combine data from the New York City Department of Education, the NYC311 municipal services dataset, and the 5-year American Community Survey to examine how noise affects educational performance via reduced in sleep quality. I presented a draft at the 2017 annual meeting of the Population Association of America. A revision of this paper, incorporating methods accounting for the spatial structure of school zones, is currently under revise and resubmit at *Spatial Demography*.

Challenge: "Prediction of Extremal Precipitation" with Vladas Pipiras, Mark He, Kenny Le, Dylan Glotzer, and Eric Friedlander. Extreme Value Analysis Conference (2017).

The Diffusion of Ultrasound Technology and 'Missing Women': An Analysis Based on Google Searches for India with Ridhi Kashyap, Francesco Billari, Nicolo Cavalli, and Ingmar Weber. International Union for the Scientific Study of Population (2017).

Online Footprints of Family Change: A Study Based on Twitter with Francesco Billari, Nicolo Cavalli, Ridhi Kashyap, and Ingmar Weber. Population Association of America "Innovative Data Collection" session (2017).

Blog Articles

Just Released: Historical Reconstruction of the New York Fed Staff Nowcast, 2002–15 with Patrick Adams, Domenico Giannone, and Argia Sbordone. Federal Reserve Bank of New York, Liberty Street Economics (July 12, 2019).

Global Trends in Interest Rates with Marco Del Negro, Domenico Giannone, Marc Giannoni, Andrea Tambalotti, and Brandyn Bok. Federal Reserve Bank of New York, Liberty Street Economics (February 27, 2019).

Monitoring Economic Conditions during a Government Shutdown with Patrick Adams, Domenico Giannone, and Argia Sbordone. Federal Reserve Bank of New York, Liberty Street Economics (February 5, 2019).

Opening the Toolbox: The Nowcasting Code on GitHub with Patrick Adams, Brandyn Bok, Daniele Caratelli, Domenico Giannone, Argia M. Sbordone, Camilla Schneier, and Andrea Tambalotti. Federal Reserve Bank of New York, Liberty Street Economics (August 10, 2018).

I led the effort for cleaning, documenting, and publishing the code underlying the New York Fed Staff Nowcast. See our GitHub page for replication files.

Other Research Experiences

Multimodality in Macro-Financial Dynamics by Tobias Adrian, Nina Boyarchenko, and Domenico Giannone. Federal Reserve Bank of New York Staff Reports (2019).

Using kernel density techniques, this paper estimates the conditional density of economic and financial conditions. Although the density is unimodal during normal times, additional modes emerge with tight financial conditions. Using parallel computing resources, I helped develop different versions of the estimation routine (direct and Gibbs sampling) and helped design the bandwidth selection procedure. To assess external validity, I coded and evaluated out-of-sample distributional forecasts against those produced by common benchmark models (flat-prior VAR, VAR with non-parametric innovations, time-varying VAR, random walk). I also designed an algorithm for finding periods of multimodality in noisy bivariate data.

Forecasting Reserve Balances by Gara Afonso, Domenico Giannone, and Gabriele La Spada (2019).

In this paper, we model the relationship between the level of reserve balances and the federal funds-IOR spread using a VAR with time-varying coefficients. My contributions include creating distributional forecasting routines that account for parameter uncertainty, computing impulse response functions under Cholesky and Blanchard-Quah identification schemes, and selecting hyperparameters via optimizing out-of-sample forecasts.

Global Trends in Interest Rates by Marco Del Negro, Domenico Giannone, Marc P. Giannoni, and Andrea Tambalotti. Journal of International Economics (2019).

With a panel of international macro-financial data, this paper models the dynamics of global interest rates using a VAR with common trends. In the baseline specification, we decompose long-run rates, short-run rates, and inflation into a global trend, country-specific trend, and a cycle component. I helped implement and finalize a suite of robustness checks taking into account demographic factors, convenience yield, and consumption growth. I also wrote replication files available on the Time Series Analysis Team GitHub page.

Economic Predictions with Big Data: The Illusion of Sparsity by Domenico Giannone, Michele Lenza, and Giorgio E. Primiceri.

Used Bayesian VARs, Bry-Boschan algorithm, and spectral decomposition techniques for staff briefings. New York Fed (2018-2019).

Awards and Honors

VAULT Award, Federal Reserve Bank of New York, December 2018

Robertson Scholars Leadership Program: Fully funded undergraduate studies with dual academic enrollment to both UNC-Chapel Hill and Duke University, 2014-2018

- **2015 summer grant**: Full funding for teaching at Breakthrough Collaborative New Orleans ($4,700)
- **2016 summer grant**: Full funding for research at Oxford University ($6,300)
- **2017 summer grant**: Supplemental funding for internship at the New York Fed ($6,300)
- **2017 LEAD grant**: Full funding for presentation at the Population Association of America annual meeting ($500)

Departmental Highest Honors, UNC-Chapel Hill Department of Statistics & Operations Research, 2018

Honors Carolina Laureate, UNC-Chapel Hill, 2018

Phi Beta Kappa, UNC-Chapel Hill, 2018

ERC Advanced Grant (AdG 694262) for 2017-2022. *Discontinuities in Household and Family Formation*, PI: Francesco Billari, joint with Bent Nielsen, Ozan Aksoy, Nicolo Cavalli, Zoe Fannon, Osea Giuntella, Jonas Harnau, Ridhi Kashyap, Berkay Ozcan, Patrick Prag, Concetta Rondinelli, Maria Sironi, Luca Stella, Ingmar Weber, and Emilio Zagheni

Skills

Extensively used MATLAB (and its parallel computing capabilities), R, LaTeX, Stata, EViews, and Python at the New York Fed. Classroom experience with SAS, Java, and SQL.

Other Positions

Member of Duke Symphony Orchestra, 2014–2018 (first desk 2015-2016)

Member of UNC Intramural Sports Program (tennis), 2014–2018

Teaching Fellow at Breakthrough Collaborative, 2015

Treasurer for UNC Community Government 2015