

## Dr. Daniel Waggoner

**Work:** Federal Reserve Bank of Atlanta  
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### Education:

Georgia State University, April 1994 - August 1995  
M. S. in Finance - August 1995  
Winner Atlanta Society of Financial Analysts Book Prize - 1995

University of Kentucky, September 1980 - August 1985  
Ph.D. in Mathematics - August 1985  
Area of specialization - Algebraic Topology  
M. A. in Mathematics - May 1983  
Awarded Graduate School Fellowship 1980 through 1983

University of Mississippi, September 1976 - May 1980  
B. S. in Mathematics, Cum Laude - May 1980  
Winner Alfred Hume Mathematics Prize - 1980

### Work Experience:

#### **Federal Reserve Bank of Atlanta**

**Research Economist and Policy Advisor**, April 2013-present

**Research Economist and Associate Policy Advisor**, September 2006-March 2013

**Research Economist and Assistant Policy Advisor**, January 2001 August 2006

**Economist II**, March 2000 - January 2001

**Economist I**, September 1997 - February 2000

**Senior Economic Analyst**, August 1996 - September 1997

**Economic Analyst**, August 1995 - August 1996

Produce high-quality economic research as evidenced by acceptance in peer reviewed academic journals. Contribute to the research environment of the Department. Provide analysis of economic issues in support of FOME preparations and other system policy activities.

**Software Consultant, Computer Technology International**, May 1993 - July 1995.

Responsible for the maintenance of existing code, the porting of existing code to different environments, and the development of new software projects. CTI produces scheduling software for the transportation industry.

**Assistant Professor of Mathematics, Agnes Scott College**, August 1987 - May 1994. Taught a wide range of undergraduate mathematics and computer science courses. Developed and implemented classroom software. Research interest focused on problems in dynamical systems, algebraic topology, and mathematical pedagogy. Administrative duties included assisting in the development of department curriculum and service on college committees.

**Visiting Assistant Professor of Mathematics, Lehigh University**, August 1985 - May 1987. Taught undergraduate calculus courses and graduate topology courses.

**Teaching Assistantship, University of Kentucky**, September 1983 - December 1984. Taught introductory mathematics courses.

### **Quantitative Skills:**

Advanced programming skills and familiarity with the C, C++, Assembly, FORTRAN, Pascal, and BASIC programming languages and the Windows, DOS and UNIX operating systems. Extensive experience in numeric programming, including non-linear optimization, dynamical systems, monte-carlo simulation, and large-scale problems. Developed user-friendly, graphical Windows interfaces.

Strong pure and applied mathematical background. Graduate level course work in topology, algebra, analysis, differential equations, numerical analysis, probability, stochastic processes, and econometrics. This grounding allows me to approach problems both analytically and numerically and to assimilate quickly and apply appropriately new quantitative techniques.

My background in mathematics, computer science, and finance, together with my teaching experience, enables me to convey complex technical ideas to a wide array of audiences. I am comfortable in both formal presentations and informal discussions.

### **Journal Publications:**

with Jonas Arias and Juan Rubio-Ramirez, "Inference Based on SVARS identified with Sign and Zero Restrictions: Theory and Applications," *Econometrica*, 86 (2), March 2018, 685-720.

with Timothy Koch and Larry Wall, "Incentive Compensation, Accounting Discretion and Bank Capital", *Journal of Economics and Business*, 95, January-February 2018, 119-140.

with Andrew Foerster, Juan Rubio-Ramirez, and Tao Zha, "Perturbation Methods for Markov-Switching DSGE Models," *Quantitative Economics*, 7 (2), July 2016, 637-669.

with Hongwei Wu and Tao Zha, "Striated Metropolis-Hasting sampler for high-dimensional models," *Journal of Econometrics*, 192 (2), June 2016, 406-420.

with Chun Chang, Kaiji Chen, and Tao Zha, "Trends and Cycles in China's Macroeconomy," NBER Macroeconomics Annual 2015, Volume 30, Eichenbaum and Parker.

with Tao Zha, "Confronting Model Misspecification in Macroeconomics," *Journal of Econometrics*, 171 (2), December 2012, 167-184.

with Roger Farmer and Tao Zha, "Minimal State Variable Solutions to Markov-Switching Rational Expectations Models," *Journal of Economic Dynamics and Control*, 35 (12), December 2011, 2150-2166.

with Zheng Liu and Tao Zha, "Sources of Macroeconomic Fluctuations: A Regime-Switching DSGE Approach," *Quantitative Economics*, 2 (2), July 2011, 251-301.

with Juan Rubio-Ramirez and Tao Zha, "Structural Vector Autoregressions: Theory of Identification and Algorithms for Inference," *Review of Economic Studies*, 77-2, April 2010, 665-696.

with Roger Farmer and Tao Zha, "Generalizing the Taylor Principle: A Comment," *American Economic Review*, 100-1, March 2010, 608-617.

with Roger Farmer and Tao Zha, "Understanding Markov-switching rational expectations models," *Journal of Economic Theory*, 144-5, September 2009, 1849-1867.

with Zheng Liu and Tao Zha, "Asymmetric Expectations Effects of Regime Shifts in Monetary Policy," *Review of Economic Dynamics*, 12-2, April 2009, 284-303.

with Roger Farmer and Tao Zha, "Indeterminacy in a forward-looking regime switching model," *International Journal of Economic Theory*, 5-1, March 2009, 69-84.

with Christopher A. Sims, and Tao Zha, "Methods for Inference in Large Multiple-Equation Markov-Switching Models," *Journal of Econometrics*, 148 (2), October 2008, 255-274.

with James D. Hamilton and Tao Zha, "Normalization in Econometrics," *Econometric Reviews*, 26 (2-4), March 2007, 221-252.

with Robert Eisenbeis and Tao Zha, "Update: Evaluating *Wall Street Journal* Survey of Forecasters," *Business Economics*, January 2004.

with Tao Zha, "A Gibbs Sampler for Structural Vector Autoregressions," *Journal of Economic Dynamics and Control*, November 2003, 28 (2), 349-366.

with Tao Zha, "Likelihood Preserving Normalization in Multiple Equation Models," *Journal of Econometrics* 114, June 2003, 329-347.

with Robert Eisenbeis and Tao Zha, "Evaluating Wall Street Journal Survey Forecasters: A Multivariate Approach," *Business Economics*, July 2002. (Winner of Abramson Scroll Award)

with Tao Zha, "Conditional Forecasts in Dynamic Multivariate Models," *The Review of Economics and Statistics*, November 1999, 81(4), 639-661.

with Charles P. Boyer and Benjamin M. Mann, "On the Homology of  $SU(n)$  Instantons," *Transactions of the American Mathematical Society*, February 1991, 323 (2), 529-561.

#### **Federal Reserve Publications:**

with Andy Bauer, Robert A. Eisenbeis, Tao Zha, "Transparency, Expectations, and Forecasts," *Federal Reserve Bank of Atlanta Economic Review* 91 (First Quarter 2006).

with Andy Bauer, Robert A. Eisenbeis, Tao Zha, "Forecast Evaluation with Cross-Sectional Data: The Blue Chip Surveys," *Federal Reserve Bank of Atlanta Economic Review* 88 (Second Quarter 2003).

with Saikat Nandi, "The Risks and Rewards of Selling Volatility," *Federal Reserve Bank of Atlanta Economic Review* 86 (First Quarter 2001).

with Saikat Nandi, "Issues in Hedging Options Positions," *Federal Reserve Bank of Atlanta Economic Review* 85 (First Quarter 2000).

#### **Working Papers:**

with Chun Chang, Kaiji Chen, and Tao Zha, "Trends and Cycles in China's Macroeconomy," Working Paper 2015-5, Federal Reserve Bank of Atlanta, June 2015.

with Hongwei Wu and Tao Zha, "The Dynamic Striated Metropolis-Hastings Sampler for High-Dimensional Models," 2014-21, November 2014.

with Andrew Foester, Juan Rubio-Ramirez, and Tao Zha, "Perturbation Methods for Markov-Switching DSGE Models", Working paper 2013-1, Federal Reserve Bank of Atlanta, (Revised August 2014).

with Jonas E. Arias and Juan Rubio-Ramirez, "Inference Based on SVARs Identified with Sign and Zero Restrictions: Theory and Applications," Working Paper 2014-1, February 2014.

with Tao Zha, "Confronting Model Misspecification in Macroeconomics", Working Paper 2010-18a, Federal Reserve Bank of Atlanta, (Revised February 2012).

with Roger Farmer and Tao Zha, "Understanding Markov-Switching Rational Expectations Models," Working Paper 2009-5, Federal Reserve Bank of Atlanta, March 2009.

with Zheng Liu and Tao Zha, "Sources of the Great Moderation: Shocks, Frictions, or Monetary Policy," Working Paper 2009-3, Federal Reserve Bank of Atlanta, (Revised October 2010).

with Roger Farmer and Tao Zha, "Minimal State Variable Solutions to Markov-Switching Rational Expectations Models," Working Paper 2008-23a, Federal Reserve Bank of Atlanta, (Revised September 2010).

with Roger Farmer and Tao Zha, "Generalizing the Taylor Principle: Comment," Working Paper 2008-19, Federal Reserve Bank of Atlanta, September 2008.

with Juan Rubio-Ramirez and Tao Zha, "Structural Vector Autoregressions: Theory of Identifications and Algorithms for Inference," Working Paper 2008-18, September 2008.

with Zheng Liu and Tao Zha, "Asymmetric Expectations Effects of Regime Shifts and the Great Moderation", Working Paper 2007-23, Federal Reserve Bank of Atlanta, October 2007.

with Roger E. A. Farmer, and Tao Zha, "Understanding the New Keynesian Model When Monetary Policy Switches Regimes," Working Paper 2007-12, Federal Reserve Bank of Atlanta, July 2007.

with Christopher A. Sims and Tao Zha, "Methods for Inference in Large Multiple-Equation Markov-Switching Models," Working Paper 2006-22, Federal Reserve Bank of Atlanta, November 2006.

with Roger E.A. Farmer and Tao Zha, "Indeterminacy in a Forward-Looking Regime-Switching Model," Working Paper 2006-19, Federal Reserve Bank of Atlanta, November 2006.

with Juan Francisco Rubio-Ramirez and Tao Zha, "Markov-Switching Structural Vector Autoregressions: Theory and Application," Working Paper 2005-27, Federal Reserve Bank of Atlanta, December 2005.

with Edwin D. Maberly, "Closing the Question on the Continuation of Turn-of-the-Month Effects: Evidence from the S&P 500 Index Futures Contract," Working Paper 2000-11, Federal Reserve Bank of Atlanta, August 2000.

with Tao Zha, "Normalization, Probability Distribution, and Impulse Responses," Working Paper 97-11, Federal Reserve Bank of Atlanta, November 1997.

"Spline Methods for Extracting Interest Rate Curves from Coupon Bond Prices," Working Paper 97-10, Federal Reserve Bank of Atlanta, November 1997.

#### **Conference Presentations / Invited Addresses:**

"Modeling Impulse Responses Directly: A Different Approach to Large Data Sets and Time Variation," Norges Bank Seminar, Oslo January 29, 2018.

"Modeling Impulse Responses Directly: A Different Approach to Large Data Sets and Time Variation," 2014 Conference on Time-varying Models for Monetary Policy and Financial Stability, Florence, June 8-9, 2017.

"Modeling and Forecasting at the the Federal Reserve," Mathematics Alumni Day, University of Kentucky, November 6, 2015.

"Estimating the Effects of Monetary Policy under Zero Lower Bound: An Endogenous Switching Approach," 2014 Conference on Monetary Policy and Financial Stability, Ottawa, October 7-8, 2014.

"Inference Based on SVAR's Identified with Sign and Zero Restrictions: Theory and Applications",  
Identification in Macroeconomics, National Bank of Poland, December 17-18, 2014.  
University of Delaware Seminar Series, November 21, 2014.  
NBER Summer Institute, Boston, July 2014.  
University of Missouri Seminar Series, November 8, 2013.

"Equi-energy Sampling of Posteriors", 2013 Annual Meeting of the European Society of Bayesian Econometrics, Oslo, August 22-23, 2013.

"Monetary Policy at the Zero Lower Bound: An Endogenous Switching Approach to Forward Guidance", 2013 Annual Meeting of the Society for Economic Dynamics, Seoul, June 27-29, 2013.

"Confronting Model Misspecification in Macroeconomics," 32nd Annual International Symposium on Forecasting, Boston, June 24-27, 2012.

"Markov-Switching Models Workshop," Board of Governors of the Federal Reserve System, 2011.

"Minimal State Variable Solutions to Markov-Switching Rational Expectations Models"  
JEDC conference in Tokyo, January 2010.  
NBER Summer Institute July 2010.

"Understanding Markov-switching rational expectations models,"  
Reserve Bank of New Zealand, June 3, 2009.  
University of Canterbury, ChristChurch, New Zealand, June 12, 2009.  
University of Otago, Dunedin, New Zealand, June 15, 2009.  
University of Auckland, Auckland, New Zealand, June 19, 2009.  
Louisiana State University, Baton Rouge, May 1, 2009.

"Has the Federal Reserve's Inflation Target Changed?,NBER Summer Workshop on Methods and Applications for Dynamic Stochastic General Equilibrium Models, July 10-11, 2008.

"Extracting Information form the Markets: A Bayesian Approach,Tenth Financial Mathematics Festival, Florida State University, Feb. 29- Mar. 1, 2008.

"Structural Vector Autoregressions: Theory and Application,Joint Statistical Meetings, Salt Lake City, Utah, July 26-August 2, 2007.

"Understanding New Keynesian Models When Monetary Policy Switches Regimes,NBER Summer Workshop on Methods and Applications for Dynamic Stochastic General Equilibrium Models, July 12-13, 2007.

"Minimal State Variable Solutions to Markov-Switching Rational Expectations Models," Workshop on Prediction and Monetary Policy in the Presence of Model Uncertainty, Norges Bank, June 1, 2007.

"Rational Expectations Models and Regime Switches,Workshop on Methods and Applications for Dynamic Stochastic General Equilibrium Models, Federal Reserve Bank of Cleveland, October 27-28, 2006.

"Generalized methods for restricted Markov-switching models with independent state variables," Bayesian Econometric Methodology, Sveriges Riksbank, September 8-9, 2006.

"Markov-Switching Structural Vector Autoregressions: Theory and Application," 12th International Conference on Computing in Economics and Finance, Limassol, Cyprus, June 22-24, 2006.

"Effects of Monetary Policy Regime Changes in the Euro Economy, Bank of Italy, Rome Italy, April 6, 2005

"Evaluating and Choosing Forecasts: The Wall Street Journal Survey, NABE Annual Meeting, Philadelphia, Oct. 3-5, 2004.

"Effects of Monetary Policy Changes in the Euro Area, Society for Economic Dynamics, Florence July 2004.

Normalization in Economics, Joint Statistical Meeting, Toronto Canada, Aug. 8-11, 2004

"Effects of Monetary Policy Regime Changes in the Euro Economy, Society of Economic Dynamics, Florence Italy, July 1-3, 2004

"Forecasting with Structural Bayesian Economic Models, fifth Financial Mathematics Festival, Florida State University, Feb. 21-22, 2003.

"Normalization in Economics, NSF/NBER Time Series Conference, University of Pennsylvania, Sept. 27-28, 2002.

"Joint Evaluation of Forecasting Performance in Real Time, International Symposium on Forecasting, Callaway Gardens Georgia, June 17-20, 2001

"Conditional Forecasts in Dynamic Multivariate Models,"

Midwest Econometric Group Meeting, Bloomington Indiana, Sept. 25-26, 1998.

Bank of England Seminar, Oct. 6, 1998.

Economic Seminar Series, Emory University, Nov. 6, 1998.

Econometric Seminar Series, Georgia State University, Nov. 20, 1998.

"Stability and Spline Techniques for Extracting the Term Structure from Bond Prices, Bank of England Seminar, Oct. 6, 1998.

"Integrating Dynamical Systems into a Mathematics for the Liberal Arts Course, *Proceedings of the Fifth International Conference on Technology in Collegiate Mathematics*, 1994.

### **Conference / Workshops Organized:**

with Hilde C. Bjørnland and Junior Maih, "Nonlinear Models in Macroeconomics and Finance of an Unstable World," Oslo, Norway, January 26-27, 2018.

with Hilde C. Bjørnland and Junior Maih, mini-course in "Regime switching in VAR and DSGE models: theory and applications," Oslo, Norway, January 22-25, 2018.

with Benoit Mojon, Chris Sims, and Tao Zha, "Workshop on Markov-Switching Time Series Models," Aix-en-Provence, France, August 25-27, 2008.