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Personal Information: Citizenship: USA. Place of Birth: California

Undergraduate Studies:
B.S., Economics, Wharton School, University of Pennsylvania, Summa Cum Laude, 2010

Graduate Studies:
University of Pennsylvania, 2010 to present
Thesis Title: "*Essays on Bayesian Macroeconometrics*"
Expected Completion Date: June 2015

Thesis Committee and References:

Professor Jesus Fernandez-Villaverde (Advisor)
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Economic Advisor and Economist Pablo Guerron-Quintana
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Ten Independence Mall,
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Teaching and Research Fields:
Primary fields: Macroeconomics, Econometrics

Teaching Experience:

2014 (Fall)	Advanced Techniques of Cross-Section Econometrics (graduate), UPenn, Teaching Assistant for Professor Petra Todd
2012-2013 (Spring)	Time Series Econometrics (graduate), UPenn, Teaching Assistant for Professor Francis Diebold
2012 (Fall)	Intermediate Microeconomics, UPenn, Teaching Assistant for Professor Aislinn

	Bohren
2012 (Summer)	Introduction to Microeconomics, UPenn, Instructor
2011 (Fall)	Introduction to Econometrics, UPenn, Teaching Assistant for Professor Xu Cheng

Research Experience and Other Employment:

2013-2014	Federal Reserve Bank of Philadelphia, Research Analyst
2010, 2011 (Summer)	UPenn, Research Assistant for Professor Jeremy Tobacman

Professional Activities

Extramural Seminars: Federal Reserve Bank of St. Louis (2014), Federal Reserve Bank of Philadelphia (2014), OMI-SoFiE Financial Econometrics Summer School (University of Oxford) (2013)

Intramural Seminars: Penn Econometrics Workshop (2014), Penn Econometrics Lunch (numerous times)

Referee Service: International Economic Review (2 times)

Honors, Scholarships, and Fellowships:

2014 (Summer)	Dissertation Intern, Federal Reserve Bank of St. Louis
2013	GAPSA Research Travel Grant, UPenn
2010	Graduate Research Fellowship Honorable Mention, National Science Foundation

Research Papers:

"Variable Downturn Risk" (Job Market Paper)

Abstract: I study a business cycle model where the probability of transitioning to a downturn state characterized by low growth evolves over time. I call a change in the future probability of transitions to the downturn state a downturn risk shock. Movements in agents' expectations alone with no changes in current or future observed fundamentals generated from the downturn risk shock are an important driver of business cycle and longer-horizon medium-frequency cycle fluctuations. The shift in expectations from an increase in the risk of the downturn state leads to declines in consumption, investment, output, and hours. I take the model to the data using Bayesian methods. The fluctuations caused by expectations changes from the downturn risk shock account for substantial output variations at business cycle frequencies and hours fluctuations at medium run frequencies. In model comparisons to other expectations-based theories of the business cycle, the model with downturn risk shocks explains the data best. I also provide exogenous evidence that supports such a theory of fluctuations. I document that the University of Michigan Index of Consumer Sentiments (ICS), a survey-based measure of consumer expectations, forecasts the 20th percentile of consumption growth innovations, but not the 80th percentile, suggesting that information relevant for downside risk in the economy drives agents' expectations. The extracted time-varying probability process from the model matches well with the ICS. Impulse response functions from downturn risk shocks produce the same comovement as those from ICS innovations in a structural vector autoregression. I show that other expectations-based shocks do not generate this comovement.

"A New Approach to Identifying the Real Effects of Uncertainty Shocks" (joint with Minchul Shin)

Abstract: This paper proposes the multivariate stochastic volatility in vector autoregression model as a framework for studying the real effects of uncertainty shocks. We advance a new approach to structurally identify uncertainty shocks that does not rely on identification of the level structural shocks. This approach is intimately linked to our conditional autoregressive inverse Wishart model of multivariate stochastic volatility. We estimate the model using a Bayesian Markov chain Monte Carlo algorithm, and we show how to construct impulse response functions and variance decompositions that can be used to analyze identified uncertainty shocks. In an empirical application studying the real effects of financial uncertainty shocks, our results indicate that financial uncertainty accounts for around 20 percent of real activity forecast variance. An increase in financial uncertainty leads to a permanent decline in real activity. Upon allowing for financial uncertainty shocks, uncertainty shocks originating in the real sector have no real effects. These results suggest looking more closely at structural models with financial sector uncertainty fluctuations.

“Does Realized Volatility Help Bond Yield Density Prediction?” (joint with Minchul Shin)

Abstract: We suggest using ``realized volatility'' as a volatility proxy to aid in model-based multivariate bond yield density forecasting. To do so, we develop a general estimation approach to incorporate volatility proxy information into dynamic factor models with stochastic volatility. The resulting model parameter estimates are highly efficient, which one hopes would translate into superior predictive performance. We explore this conjecture in the context of density prediction of U.S. bond yields by incorporating realized volatility into a dynamic Nelson-Siegel (DNS) model with stochastic volatility. The results clearly indicate that using realized volatility improves density forecasts relative to popular specifications in the DNS literature that neglect realized volatility.