

ANLONG QIN

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EDUCATION

Ph.D., Economics, Boston University, Boston MA, May 2021 (expected)

Dissertation Title: *Essays on state-space and regime-switching models in a high-dimensional setting*

Main advisor: Zhongjun Qu

Dissertation Committee: Zhongjun Qu, Pierre Perron and Hiroaki Kaido

M.S., Quantitative Economics, Renmin University of China, Beijing, China, 2014

B.A., Economics, Renmin University of China, Beijing, China, 2011

FIELDS OF INTEREST

Econometrics, Time Series Econometrics, Financial Econometrics

WORKING PAPERS

“Modeling Regime Switching in High Dimensional Data with Applications to U.S. Business Cycles” (joint with Zhongjun Qu), Job Market Paper

WORK IN PROGRESS

“Inference on State Variables and Predictions in Linear Gaussian State Space Models with Aggregate and Disaggregate Data”

“Statistical Analysis of High Dimensional Autoregressive Markov Regime Switching Models”

“Asymptotic Properties of MLE for Continuous Time Markov Switching Models”(joint with Guang Zhang and Li Chen)

“Asset Prices Dynamics with Exogenous and Endogenous Jumps”

FELLOWSHIPS AND AWARDS

Dean’s Fellowship, Boston University, 2014-2019

Outstanding Graduate Students Awards , Renmin University, 2013

National Encouragement Scholarship, Renmin University, 2009-2010

TEACHING EXPERIENCE

Teaching Assistant, Advanced Econometrics I (PhD), Department of Economics, Boston University, Spring 2018 - 2019

Teaching Assistant, Advanced Econometrics II (PhD), Department of Economics, Boston University, Fall 2017 - 2018

Teaching Assistant, Empirical Economics Analysis I (Undergraduate), Department of Economics, Boston University, Spring 2016 - 2017
Teaching Assistant, Empirical Economics II and Financial Economics (Undergraduate), Department of Economics, Boston University, Fall 2016
Teaching Assistant, Intermediate Microeconomics (Undergraduate), Department of Economics, Boston University, Fall 2015
Teaching Assistant, Advanced Microeconomics (Master), Renmin University, Fall 2013

LANGUAGES

English (fluent), Chinese (native)

COMPUTER SKILLS: MATLAB, LaTeX, Python

CITIZENSHIP/VISA STATUS: China/F1

REFERENCES

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Modeling Regime Switching in High Dimensional Data with Applications to U.S. Business Cycles *(with Zhongjun Qu), Job Market Paper*

Identifying business cycles and forecasting macroeconomic variables are two essential tasks of empirical macroeconomic research. In this paper, we develop a modeling framework and propose estimation methods for uncovering regime switching in high dimensional data (i.e., with large N and T). A leading application is to dating U.S. business cycles using disaggregated data. We demonstrate that under certain conditions, the proposed model dominates its corresponding aggregate model in its inference on state variables and forecasts of aggregate observable variables. The intuition is that there are two sources of randomness for disaggregate processes: the error terms and the state variables. By aggregation, the information on the state variables can average out while the noise on the error terms can accumulate. Due to the high dimensionality of the parameter space, the standard MLE fails to converge, and we develop an effective Gibbs sampling algorithm for estimation and inference. As an empirical application, we consider a dataset consisting of four groups of U.S. aggregate macroeconomic variables and their disaggregate sub-series: industrial production, capacity utilization, employment rate, and hours worked. There are two significant findings. First, in most cases, the proposed model produces smaller mean squared forecasting errors than the corresponding aggregate model. The model also provides forecasts for sub-series (e.g., state-level unemployment), which the aggregate model can not offer. Second, the inference on probabilities of recessions from our model is very close to the NBER's business cycle dating results.

Inference on State Variables and Predictions in Linear Gaussian State Space Models with Aggregate and Disaggregate Data

In mean squared errors sense and for small scale aggregation, this paper shows in theory that for linear Gaussian state space models, the disaggregate model dominates its corresponding aggregate model in terms of both the inference on common state variables and the forecast on aggregate observable variables. The contribution of this paper is twofold. First, it extended the well known results from ARMA models to linear Gaussian state space models that disaggregate model have better forecast than aggregate model. Second, we derived new theoretical results for inference on common state variables in the context of aggregate and disaggregate models which again indicates that disaggregate model has better inference on state variables than aggregate model. The Monte Carlo simulation confirms our theoretical results. The application of analyzing the data of total unemployment and its disaggregate unemployment by genders also shows some evidence favoring the disaggregate model. However, for general nonlinear non-Gaussian state space models, there are no existing theoretical findings yet.