

Econ 482

**Time Series Methods**

Fall 2020

1. CONTACT INFORMATION

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2. FORMAT

We meet twice a week, on Tuesday and Thursday, at 11:10–1:00pm. We will begin the quarter with remote classes (you will find the Zoom link on Canvas). As the quarter progresses, depending on preferences and the Covid situation, we might switch to live classes (in room KGH 1410), but this is uncertain at this point.

3. GENERAL DESCRIPTION

This is a course on [empirical macroeconomics/applied time series](#), with a focus on Bayesian methods to conduct inference in macro-econometric models. The emphasis on Bayesian inference is motivated by the increased popularity of this methodology, which is gradually becoming the dominant paradigm in macro/time-series empirical work. Topics include Bayesian methods for prediction with big data and large information sets, vector autoregressions (VARs), structural VARs, state-space models, time-varying parameters and stochastic volatility models, estimation of linear and nonlinear dynamic stochastic general equilibrium (DSGE) models, model comparison and model choice.

A substantial part of the course will be based on papers. The references closest to the material covered in class are the survey article by [Del Negro and Schorfheide \(2011\)](#) and (especially during the second part of the course) the books by [DeJong and Dave \(2011\)](#) and [Herbst and Schorfheide \(2015\)](#). Other good references are: [Canova \(2007\)](#), [Bauwens et al. \(1999\)](#), [Geweke \(2005\)](#) and [Gelman et al. \(2004\)](#) (although [Gelman et al. \(2004\)](#) does not focus on time series applications). An always useful reference is [Hamilton \(1994\)](#) (which, hopefully, you have already bought at some point of your graduate studies).

#### 4. EVALUATION

Evaluation will be based on homeworks, and a final presentation of a preliminary research project or a recently published paper.

#### 5. APPROXIMATE PLAN OF THE COURSE AND READING LIST

Introduction to Bayesian inference

[Geweke \(2005\)](#), [Bauwens et al. \(1999\)](#), [Gelman et al. \(2004\)](#)

Bayesian analysis of linear Gaussian models

[Geweke \(2005\)](#), [Bauwens et al. \(1999\)](#), [Gelman et al. \(2004\)](#), [Hamilton \(1994\)](#)

Prediction with big data and large information sets

[Hastie et al. \(2015\)](#), ch. 1 and 2, [Park and Casella \(2008\)](#), [Giannone et al. \(2020\)](#)

Inference in AR models and the “unit root controversy”

[Sims and Uhlig \(1991\)](#)

Vector autoregressions

[Hamilton \(1994\)](#), [Canova \(2007\)](#)

Priors for vector autoregressions

[Doan et al. \(1984\)](#), [Kadiyala and Karlsson \(1997\)](#), [Sims and Zha \(1998\)](#), [Karlsson \(2013\)](#), [Banbura et al. \(2010\)](#), [Giannone et al. \(2015\)](#), [Giannone et al. \(2019\)](#), [Del Negro and Schorfheide \(2011\)](#)

Structural VARs: The identification of monetary, technology and fiscal shocks, and their economic impact

[Christiano et al. \(1999\)](#), [Stock and Watson \(2001\)](#), [Blanchard and Quah \(1989\)](#), [Gali \(1999\)](#), [Christiano et al. \(2004\)](#), [Francis and Ramey \(2005\)](#), [Fisher \(2006\)](#) [Uhlig \(2005\)](#), [Rubio-Ramirez et al. \(2010\)](#), [Blanchard and Perotti \(2002\)](#), [Ramey \(2011\)](#)

Monte carlo integration

[Gelman et al. \(2004\)](#), [Bauwens et al. \(1999\)](#), [Geweke \(2005\)](#)

State-space models, and the Kalman filter and smoother

[Hamilton \(1994\)](#), [Kim and Nelson \(1999\)](#), [DeJong and Dave \(2011\)](#)

Time-varying macroeconomic dynamics: Drifting parameters and stochastic volatility

[Kim and Nelson \(1999\)](#), [Carter and Kohn \(1994\)](#), [Kim et al. \(1998\)](#), [Primiceri \(2005\)](#), [Cogley and Sargent \(2005\)](#), [Sims and Zha \(2006\)](#)

Inference in DSGE models and the sources of business cycle fluctuations

An and Schorfheide (2007), DeJong and Dave (2011), Herbst and Schorfheide (2015), Smets and Wouters (2007), Justiniano et al. (2010), Justiniano et al. (2011), Christiano et al. (2014), Prescott (1986)

Model comparison and model choice

Gelman et al. (2004), Kass and Raftery (1995), Geweke (1998), section 4, Chib (1995), Smets and Wouters (2007)

Nonlinear DSGE models and the particle filter

Fernandez-Villaverde and Rubio-Ramirez (2007), Pitt and Shephard (1999), Herbst and Schorfheide (2015)

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