ECON 7801. ECONOMETRICS II: ADVANCED MACROECONOMETRICS

Fall 2021

Instructor:	Ivan Mendieta-Muñoz, Ph.D.	**Time:**	MoWe, 1:25 p.m. — 2:45 p.m.
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Contact information

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Personal website
University website

Course Page

Canvas

Prerequisites

ECON 4020; ECON 6620; ECON 7800; or an equivalent background.
This assumes that students have a working knowledge in macroeconomic and econometric theory, matrix algebra, multivariate calculus and statistical inference.

Course Description and Objectives

This course concentrates on time series and empirical macroeconomic applications. The course will equip students with the necessary knowledge to be able to undertake econometric analysis of the type commonly associated with modern macroeconomic research. Emphasis is on hands-on implementation of the methods covered in the course. Topics include linear and nonlinear univariate and multivariate time series models and methods; computational approaches to model comparison; structural identification; and state-space models. We will rely mainly on Bayesian methods for statistical analysis.

On successfully completing this course students will be able to:

1. Read intelligently macro-empirical research with a proper understanding of the underlying methodology of inference and identification strategies.
2. Conduct empirical research suitable for publication in an economics or econometrics journal.
3. Become confident in learning novel macro-econometric techniques.
4. Understand the conditions under which particular time series estimators and methods are appropriate.

Learning Outcomes

1. *Inquiry and Analysis:* Empirical macroeconomics and econometrics are contentious disciplines since there are competing theories. This course will discuss models and methods to understand relationships between aggregate economic variables, investigate alternative theoretical chains of causation, and examine empirical evidence for competing hypotheses.

2. *Critical Thinking:* The emphasis will be on how to set up empirical models for suitable macroeconomic analysis and to obtain logical conclusions from them.

3. *Quantitative Literacy:* Students will also develop quantitative skills that will allow them to understand logical and numerical relationships between macroeconomic variables.

Main Textbook References

- Blake, Andrew and Mumtaz, Haroon (2019). *Applied Bayesian Econometrics for Central Bankers*. London: Bank of England, Centre for Central Banking Studies.
- Chan, Joshua, Koop, Gary, Poirier, Dale J. and Tobias, Justin L. (2020). *Bayesian Econometric Methods*. Cambridge: Cambridge University Press. 2nd Edition.
- Enders, Walters (2015). *Applied Econometric Time Series*. New York: Wiley. 4th Edition.
- Koop, Gary (2003). *Bayesian Econometrics*. Chichester: Wiley.

Additional Textbook References

- Durbin, James and Koopman, Siem J. (2012). *Time Series Analysis by State Space Methods*. Oxford: Oxford Statistical Science Series. 2nd Edition.
- Favero, Carlo (2001). *Applied Macroeconometrics*. Oxford: Oxford University Press.
- Hamilton, James (1994). *Time Series Analysis*. Princeton: Princeton University Press.
- Kim, Chang-Jim and Nelson, Charles R. (1999). *State-space Models with Regime Switching. Classical and Gibbs sampling Approaches with Applications.* Cambridge: The MIT Press.
- Lütkepohl, Helmut (2005). *New Introduction to Multiple Time Series Analysis*. Berlin: Springer.
- Shumway, Robert H. and Stoffer, David S. (2017). *Time Series Analysis and its Applications. With R Examples*. Cham: Springer. 4th Edition.
- Stock, James and Watson, Mark (2015). *Introduction to Econometrics*. Westford: Pearson. 3rd Edition.

Required Software

- Download Matlab here
- Download R here and RStudio here

Students are also encouraged to keep up with current economic news. *Financial Times*, *New York Times* and *Wall Street Journal* are excellent sources and they are free on campus. You may also want to peruse *The Economist*. Additionally, an excellent website where you can find op-ed pieces by leading economists is *Project Syndicate*.

Course Requirements

The lectures combine only the key points of each of the chapters, so it is important that you follow the reading assignments for each class.

Attendance is optional. However, attendance has a positive correlation with success on the class assignments.

University Policies

1. **The Americans with Disabilities Act.** The Department of Economics at the University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you need accommodations in this class, reasonable prior notice needs to be given to the instructor and to the Center for Disability Services (162 A. Ray Olpin Student Union Building, 581-5020 (V/TDD)) to make arrangements for accommodations (more information can be found here). All written information in this course can be made available in an alternative format with prior notification to the Center for Disability Services.

2. **University Safety.** The University of Utah values the safety of all campus community members. To report suspicious activity or to request a courtesy escort, call campus police at 801-585-COPS (801-585-2677). You will receive important emergency alerts and safety messages regarding campus safety via text message. More information regarding safety and to view available training resources (including helpful videos) can be found here.

3. **Addressing Sexual Misconduct.** Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a civil rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted, you are encouraged to report it to the Title IX Coordinator in the Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to the police, contact the Department of Public Safety, 801-585-2677(COPS).

4. **Undocumented Student Support.** Immigration is a complex phenomenon with broad impact —those who are directly affected by it, as well as those who are indirectly affected by their relationships with family members, friends, and loved ones. If your immigration status presents obstacles to engaging in specific activities or fulfilling specific course criteria, confidential arrangements may be requested from the Dream Center. Arrangements with the Dream Center will not jeopardize your student status, your financial aid, or any other part of your residence. The Dream Center offers a wide range of resources to support undocumented students (with and without DACA) as well as students from mixed-status families. To learn more, please contact the Dream Center at 801.213.3697 or visit the Dream Center website.

5. **COVID-19 situation.** University leadership has urged all faculty, students, and staff to model the vaccination, testing, and masking behaviors we want to see in our campus community. These include: vaccination, masking indoors, and weekly asymptomatic coronavirus testing.

   (a) **Vaccination**. Please get a COVID-19 vaccination if you have not already done so. Vaccination is proving highly effective in preventing severe COVID-19 symptoms, hospitalization and death from coronavirus. Vaccination is the single best way to stop this COVID resurgence in its tracks. Many in the campus community already have gotten vaccinated: more than 80% of U. employees and over 70% of U. students. Visit here, here or here to schedule your vaccination.

   (b) **Masking**. While masks are no longer required outside of Health Sciences facilities, UTA buses and campus shuttles, CDC guidelines now call for everyone to wear face masks indoors. Treat masks like seasonal clothing (i.e., during community surges in COVID transmission, masks are strongly encouraged indoors and in close groups outside). Check the CDC website periodically for masking updates.

   (c) **Testing**. If you are not yet vaccinated, get weekly asymptomatic coronavirus tests. This is a helpful way to protect yourself and those around you because asymptomatic individuals can

unknowingly spread the coronavirus to others. Asymptomatic testing centers are open and convenient, see here. Students must self-report if they test positive for COVID-19 via this website.

Exams and Grading Policy

The course grade will be based on four homework assignments and a final research paper submitted at the end of the semester. Therefore:

Homework Assignments (75%) + Final Research Paper (25%)

The final research paper needs to be an econometric project of the student's own design. It could be an exercise in applying econometric techniques to some economic, social or financial issue amenable to empirical testing, preferably a time series or empirical macroeconomics application.

Your final report should be typewritten and follow conventional footnoting and bibliographic rules. It should be between 10 and 12 pages long, double-spaced. Papers more than 12 pages lose points. Your paper should briefly review the relevant literature. It should define measurable versions of the variables of interest and fit them into an econometric specification. It should apply appropriate estimation techniques, reporting the results clearly and concisely; and it should discuss the inferences that are justified from your results. Please do not include raw computer output.

Late assignments will not get credit except in the cases of:

1. *Medical emergencies.*
2. *Officially sanctioned University activities.*
3. *Religious obligations.*

As indicated in PPM 9-7 Sec 15, the appropriate unit should provide a written statement for the reason of absence. In cases 2 and 3, students should get in touch with me at least one week before the exam and reschedule the examination. Students will not be assigned extra credit work to improve their grades. Senior class students' work will not be graded differently.

Grading system follows the university standards:

- Excellent, superior performance: A (90-100%), A- (85-89.9%)
- Good performance: B+ (80-84.9%), B (75-79.9%), B- (70-74.9%)
- Standard performance: C+ (65-69.9%), C (60-64.4%), C- (55-59.9%)
- Substandard performance: D+ (50-54.9%), D (45-49.9%), D- (40-44.9%)
- Unsatisfactory performance: E (0-39.9%)

Important dates

Labor Day ..... Monday, September 6
Homework #1 ..... Monday, September 13
Homework #2 ..... Monday, October 4
Fall Break ..... Sunday-Sunday, October 10-17
Homework #3 ..... Monday, October 25
Homework #4 ..... Monday, November 22
Final Research Paper ..... Monday, December 13

Class Rules

1. I encourage student cooperation in homework assignments. However, each student must present her own assignment. Duplication of the same assignment under different names is not acceptable and is considered cheating. Cheating in homework assignments or exams and other types of academic misconduct will be dealt with in accordance with the University regulations. Full details on procedures and penalties can be found here. Punishments can be severe, so don't do it.
2. No electronic submissions will be accepted. You must hand in a hard copy of your assignments, either a manuscript or a printed document.
3. I will use Canvas for announcements, homework assignments, posting extra readings, etc. However, Canvas is not a substitute to attending class. It is your responsibility to keep up with the class.
4. Come to class in time.
5. Read the assigned material in advance and familiarize with the subject before the lecture.
6. Turn off your cell phones and remove them from your desk.
7. Do not believe any of the economics and/or econometrics you read in the textbook or elsewhere. Learn it well and critically.
8. Do not believe any of the economics and/or econometrics I present in class. Learn it well and critically.

Course Outline

The following outline is approximate. We may slow down or speed up in accordance with the needs and demands of the class.

- *Lecture 1. Bayesian econometrics: an overview.* Chapters 1 through 5 of Koop (2003) and Chapters 1 through 10 of Chan et al. (2020)
- *Lecture 2. Univariate time series methods.* Chapters 1 and 2 of Enders (2015), Chapter 1 of Blake and Mumtaz (2019), Chapter 6 of Koop (2003) and Chapters 11, 12 and 17 of Chan et al. (2020)
- *Lecture 3. Mixture models.* Chapter 15 of Chan et al. (2020) and Chapter 10 of Koop (2003)
- *Lecture 4. State space unobserved components models.* Chapter 18 and 19 of Chan et al. (2020), Chapter 8 of Koop (2003) and Chapter 3 of Enders (2015)
- *Lecture 5. Multivariate time series methods.* Chapters 4 through 6 of Enders (2015), Chapter 20 of Chan et al. (2020) and Chapters 2, 3, 4, 5 and 7 of Blake and Mumtaz (2019)