# Macroeconomics II

# University of Padova

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## Aim of the course

This is a 30 hour-subject. The goal of this subject is to learn how to estimate multivariate models for the analysis of the business cycle, identify its drivers, estimate the transmission mechanisms of structural impulses, and assess their relevance. The main tools studied in this course are the Vector AutoRegressive (VAR) model, which has been heavily employed to conduct macroeconomic analysis since (at least) the seminal contribution by Sims (1980), the local projections analysis originally proposed by Jordà (2005), and the DSGE frameworks popularized by Christiano, Eichenbaum, and Evans (2005) and Smets and Wouters (2007). Students will be introduced to a variety of different identification strategies to process the data and identify the business cycle effects of the most relevant macroeconomic shocks, as well as to techniques that enable a researcher to take a dynamic stochastic general equilibrium (DSGE) framework to the data. At the end of the course, students will be able to: i) read state-of-the-art scientific papers based on Structural VARs (SVARs), Local Projections (LPs), and DSGE frameworks; ii) produce scientific research with such approaches.

## Assessment

- *Students' presentations of state-of-the-art papers: 20%.* These 45 minute-long presentations will be group-presentations, with questions from the audience (Efrem, Giovanni, and the non-presenting students). The papers you will be required to read and present are those identified with the symbol (*).

- *Final project: 80%.* The final project is expected to be a novel piece of research with a short motivation, a description of the data and the econometric approach, a documentation of the main result with comments (one Figure/Table could be enough), and a short concluding section. In other words, this project is expected to be a short scientific-type of paper. The final project is expected to be a solo

project (although collaboration among students is allowed). The (hard!) deadline for the project is March 31, 2024.

# Classes

In presence or online, depending on the sanitary conditions. Please have a look at the official schedule for the time/place of our classes (the latter applies if classes are in presence - otherwise, a zoom link will be sent to you for each class we do online). Students' presentations will take place at the end of the course.

# Syllabus & readings

References for this subject are books and scientific papers. The two main books are Kilian and Lütkepohl (2017) (VAR models) and Herbst and Schorfheide (2015) (DSGE frameworks). The papers listed below are interesting readings (in part covered in class) one could start from to write his/her PhD thesis. References marked with an asterisk will be presented in class by students.

1. *From DSGE to VAR frameworks*

Kilian and Lütkepohl (2017) - chapter 6, Fernández-Villaverde, Rubio-Ramírez, Sargent, and Watson (2007), Ravenna (2007), Del Negro, Schorfheide, Smets, and Wouters (2007), Forni, Gambetti, and Sala (2019).

2. *SVAR: Zero restrictions*

Kilian and Lütkepohl (2017) - chapters 4 & 8, Sims (1980), Christiano, Eichenbaum, and Evans (1999), Christiano, Eichenbaum, and Evans (2005), Stock and Watson (2001), Castelnuovo and Surico (2010), Wu and Xia (2016).

3. *DSGE models: Limited-information estimation by SVAR IRFs matching*

Boivin and Giannoni (2006), Christiano, Eichenbaum, and Evans (2005), Canova and Sala (2009), Christiano, Trabandt, and Walentin (2011).

4. *SVAR: Traditional sign restrictions & recent refinements*

Kilian and Lütkepohl (2017) - chapter 13, Faust (1998), Canova and de Nicoló (2002), Uhlig (2005), Fry and Pagan (2011), Rubio-Ramírez, Waggoner, and Zha (2010), Canova and Paustian (2011), Baumeister and Hamilton (2015), Kim, Moon,

and Velasco (2017), Uhlig (2017), Arias, Rubio-Ramírez, and Waggoner (2018), (*) Antolín-Díaz and Rubio-Ramírez (2018), Arias, Caldara, and Rubio-Ramírez (2019), (*) Kilian and Murphy (2012).

5. *SVAR & DSGE models: Uncertainty shocks and non-linearity in macro (an introduction)*

*Theory*: Fernández-Villaverde, Guerrón-Quintana, Rubio-Ramírez, and Uribe (2011), Basu and Bundick (2017)

*Empirics*: Bloom (2009), Jurado, Ludvigson, and Ng (2015), Caggiano, Castelnuovo, and Groshenny (2014), Caggiano, Castelnuovo, and Pellegrino (2017), Furlanetto, Ravazzolo, and Sarferaz (2019), Ludvigson, Ma, and Ng (2021), Pellegrino, Castelnuovo, and Caggiano (2022).

6. *Proxy-SVARs*

Kilian and Lütkepohl (2017) - chapter 15, (*) Mertens and Ravn (2013), Stock and Watson (2018), Gertler and Karadi (2015), Caldara and Kamps (2017), (*) Jarociński and Karadi (2020), Wolf (2020), (*) Känzig (2021), (*) Lagerborg, Pappa, and Ravn (2022).

7. *Local Projections*

Kilian and Lütkepohl (2017) - chapter 12, Jordà (2005), (*) Ramey and Zubairy (2018), Tenreyro and Thwaites (2016), Plagborg-Møller and Wolf (2020), Ascari and Haber (2021), (*) Antolín-Díaz and Surico (2022), Li, Plagborg-Møller, and Wolf (2021).

8. *DSGE models: Metropolis-Hastings*

Herbst and Schorfheide (2015), chapters 2-4, Smets and Wouters (2007), Christiano, Motto, and Rostagno (2014), Canova and Sala (2009), Leeper, Traum, and Walker (2017), Angeletos, Collard, and Dellas (2020).

# References

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