

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 will be communicated in class.
- *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 30, 2025.

Classes

In presence. 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).¹ The papers listed below are interesting readings (in part covered in class) one could start from to write his/her PhD thesis.

1. *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).

2. *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 (2010).

3. *Growth-at-risk*

Adrian, Boyarchenko, and Giannone (2019).

4. *Intro do Dynamic Factor Models*

Stock and Watson (2016).

¹The Kilian and Lütkepohl (2017) is available at <https://doi.org/10.1017/9781108164818>.

5. *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).

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. *Counterfactual simulations with VARs*

Sims and Zha (2006), McKay and Wolf (2023).

8. *Forecasting with VARs*

Giannone, Lenza, and Primiceri (2015), Giannone, Lenza, and Primiceri (2019).

9. *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), Jordà and Taylor (2023).

10. *DSGE models: Metropolis-Hastings (time permitting)*

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).

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Denominazione	Macroeconomia II
Docente	Giovanni Caggiano, Efrem Castelnuovo e Giovanni Pellegrino
Ore	30
CFU	6
Periodo di svolgimento	Gennaio-Febbraio 2025
Modalità di erogazione	<input checked="" type="checkbox"/> In presenza <input type="checkbox"/> A distanza <input type="checkbox"/> Duale
Lingua di erogazione	Inglese
Obbligo presenza	<input type="checkbox"/> Sì (% minima di presenza) <input checked="" type="checkbox"/> No
Contenuti del corso	<p>Gli strumenti principali studiati in questo corso sono il modello <i>Vector AutoRegressive</i> (VAR), ampiamente utilizzato per condurre analisi macroeconomiche sin dal contributo fondamentale di Sims (1980), l'analisi delle <i>Local Projections</i> proposta originariamente da Jordà (2005), e i modelli DSGE resi popolari da Christiano, Eichenbaum ed Evans (2005) e Smets e Wouters (2007). Gli studenti verranno introdotti a una varietà di strategie di identificazione per elaborare i dati e identificare gli effetti del ciclo economico derivanti dai più rilevanti shock macroeconomici, nonché a tecniche che permettono a un ricercatore di applicare un modello DSGE ai dati. Al termine del corso, gli studenti saranno in grado di: i) leggere articoli scientifici all'avanguardia basati su VAR strutturali (SVAR), <i>Local Projections</i> (LP) e modelli DSGE; ii) produrre ricerche scientifiche utilizzando questi approcci.</p> <ol style="list-style-type: none">1. Dai modelli DSGE ai modelli VAR2. SVAR: Restrizioni con zeri.3. Growth-at-risk4. Modelli a fattori dinamici5. Modelli DSGE: Stima a informazione limitata mediante il matching dei risultati da modelli SVAR6. Modelli SVAR e DSGE: Shock di incertezza e non linearità in macroeconomia (un'introduzione)7. SVAR: Restrizioni tradizionali sui segni e recenti affinamenti8. Proxy-SVAR9. Simulazioni controfattuali con VAR10. Previsioni con VAR11. <i>Local Projections</i>12. Modelli DSGE: <i>Metropolis-Hastings</i> (tempo permettendo)
Obiettivi di apprendimento	L'obiettivo di questo corso è imparare a stimare modelli autoregressivi multivariati (VAR) per l'analisi del ciclo economico, identificare i fattori determinanti del ciclo economico, stimare i meccanismi di trasmissione degli impulsi strutturali e valutarne la rilevanza.
Metodologie didattiche	Lezioni frontali del docente e presentazioni di gruppo degli studenti



Corso su competenze trasversali, interdisciplinari, transdisciplinari Sì No

Possibile partecipazione di dottorandi di altri corsi Sì No

Prerequisiti (non obbligatorio) max 3750 caratteri

Modalità d'esame (se previsto) Valutazione finale:

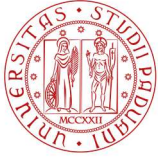
- Presentazioni degli studenti di articoli all'avanguardia: 20% del voto finale. Queste presentazioni della durata di 45 minuti saranno presentazioni di gruppo, con domande dal pubblico (Efrem, Giovanni e gli studenti non relatori). Gli articoli che dovrete leggere e presentare saranno comunicati in aula.
- Progetto finale: 80% del voto finale. Il progetto finale deve essere un pezzo originale di ricerca con una breve motivazione, una descrizione dei dati e dell'approccio econometrico, una documentazione del risultato principale con commenti (una figura/tavola potrebbe essere sufficiente) e una breve sezione conclusiva. In altre parole, ci si aspetta che questo progetto sia un breve articolo di tipo scientifico. Il progetto finale deve essere un progetto individuale (anche se è consentita la collaborazione tra studenti). La scadenza (ferma!) per il progetto è il 30 marzo 2025.

Materiale studio

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 - Uhlig, H. (2017): "Monetary Policy Shocks in the Euro Area: An Agnostic Approach," *Journal of Monetary Economics*, 89, 11–26.
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 - Waggoner, D. F., and T. Zha (2020): "Identifying Monetary Policy Shocks: A New Approach," *American Economic Journal: Macroeconomics*, 12(2), 206–236.
 - Zhang, Y. (2019): "The Macroeconomic Effects of Government Spending: Evidence from the U.S. States," *Journal of Economic Dynamics and Control*, 105, 100–121.

Informazioni
aggiuntive

max 3750 caratteri



Course unit English denomination	Macroeconomics II
Teacher in charge	Giovanni Caggiano, Efrem Castelnuovo and Giovanni Pellegrino
Teaching Hours	30
Number of ECTS credits allocated	6
Course period	January-February 2025
Course delivery method	<input checked="" type="checkbox"/> In presence <input type="checkbox"/> Remotely <input type="checkbox"/> Blended
Language of instruction	English
Mandatory attendance	<input type="checkbox"/> Yes (% minimum of presence) <input checked="" type="checkbox"/> No
Course unit contents	<p>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.</p> <ol style="list-style-type: none">1. From DSGE to VAR frameworks2. SVAR: Zero restrictions3. Growth-at-risk4. Dynamic Factor Models5. DSGE models: Limited-information estimation by SVAR IRFs matching6. SVAR & DSGE models: Uncertainty shocks and non-linearity in macro (an introduction)7. SVAR: Traditional sign restrictions & recent refinements8. Proxy-SVARs9. Counterfactual simulations with VARs10. Forecasting with VARs11. Local Projections12. DSGE models: Metropolis-Hastings (time permitting)
Learning goals	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.
Teaching methods	Frontal lectures and students' group presentations.



Course on transversal,
interdisciplinary,
transdisciplinary skills Yes
 No

Available for PhD
students from other
courses Yes
 No

Prerequisites
(not mandatory) max 3750 caratteri

Examination methods (in applicable) 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 will be communicated in class.
- 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 30, 2025.

Suggested readings

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- Ascari, G., and T. Haber (2021): "Non-linearities, state-dependent prices and the transmission mechanism of monetary policy," *Economic Journal*, forthcoming.
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- Canova, F., and M. Paustian (2011): "Business cycle measurement with some theory," *Journal of Monetary Economics*, 58, 345–361.
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 - Christiano, L., R. Motto, and M. Rostagno (2014): "Risk Shocks," *American Economic Review*, 104(1), 27–65.
 - Christiano, L., M. Trabandt, and K. Walentin (2010): "DSGE Models for Monetary Policy Analysis," in: B. M. Friedman and M. Woodford (Eds.): *Handbook of Monetary Economics*, Volume 3a, 285–367.
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 - Del Negro, M., F. Schorfheide, F. Smets, and R. Wouters (2007): "On the Fit of New-Keynesian Models," *Journal of Business and Economic Statistics*, 25(2), 124–162.
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 - Gertler, M., and P. Karadi (2015): "Monetary Policy Surprises, Credit Costs, and Economic Activity," *American Economic Journal: Macroeconomics*, 7(1), 44–76.
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 - Leeper, E. M., N. Traum, and T. B. Walker (2017): "Clearing Up the Fiscal Multiplier Morass," *American Economic Review*, 107(8), 2409–2454.
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- McKay, A., and C. K. Wolf (2023): "What Can Time-Series Regressions Tell Us About Policy Counterfactuals?," *Econometrica*, 91(5), 1695–1725.
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 - . O. Ravn (2014): "A Modern History of Fiscal Prudence and Profligacy," *Journal of Monetary Economics*, 68, 26–44.
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Additional information

max 3750 caratteri
