PhD Course – University of Milan

Quantitative Effects of Monetary and Fiscal Policy

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Aim of the course

This 20-hour PhD course studies the quantitative effects of monetary and fiscal policy using both structural and empirical macroeconomic models. The goal of this course is to introduce students to multivariate models for analyzing business cycles. Students will learn how to identify key economic drivers, assess the transmission of structural shocks, and evaluate their economic significance.

The course is organized in two parts. The first part focuses on medium-scale Dynamic Stochastic General Equilibrium (DSGE) models, building on the material covered in the second term. Particular attention is devoted to the Smets and Wouters (2007) model, its Bayesian estimation, and selected extensions relevant for policy analysis. The second part studies the empirical identification and quantitative evaluation of monetary and fiscal policy shocks. It reviews the main approaches used in the literature, including DSGE-based analysis, Structural Vector Autoregressions (SVARs), and Local Projections (LPs), with emphasis on identification strategies, transmission mechanisms, and policy interactions.

The course aims to provide students with a unified perspective on structural and reduced-form approaches to policy evaluation. At the end of the course, students are expected to:

- Read scientific papers based on SVARs, LPs and DSGE models.
- Conduct independent research using these advanced econometric frameworks.

Assessment

Each student is required to complete an individual project in the form of a short scientific-style paper. The project should be based on one or more of the articles marked with an asterisk ($*$) in this syllabus, or on comparable works by the same or related authors. The paper may include, but is not limited

to, the replication of key results, a critical referee-style evaluation, and a well-developed proposal of potential methodological or theoretical extensions.
Deadline: **July 20, 2026**.

Syllabus and Readings

Main books:

- Herbst and Schorfheide (2015) for DSGE frameworks.
- Kilian and Lütkepohl (2017) for VAR models.

DSGEs

1. **Turning a DSGE model into a Bayesian model**
   Herbst and Schorfheide (2015) - Chapter 2.
2. **A crash course in Bayesian Inference**
   Herbst and Schorfheide (2015) - Chapter 3.
3. **Metropolis-Hastings Algorithms for DSGE models**
   Herbst and Schorfheide (2015) - Chapter 4, Smets and Wouters (2007).

SVARs and LPs

1. **VAR: Reduced-form analysis**
   Kilian and Lütkepohl (2017) - Chapter 2, Lenza and Primiceri (2020), Castelnuovo and Surico (2010).
2. **SVAR: Cholesky-identification strategy**
   Kilian and Lütkepohl (2017) - Chapter 4, Sims (1980), Christiano, Eichenbaum, and Evans (1999, 2005), Stock and Watson (2001), Carlstrom, Fuerst, and Paustian (2009).
3. **SVAR: Traditional sign restrictions**
   Kilian and Lütkepohl (2017) - Chapter 13, Faust (1998), Canova and de Nicoló (2002), Uhlig (2005, 2017), Fry and Pagan (2011), Rubio-Ramirez, Waggoner, and Zha (2010), Baumeister and Hamilton (2015), Kim, Moon, and Velasco (2017), Uhlig (2017), Arias, Rubio-Ramírez, and Waggoner (2018).

4. **SVAR: Restrictions on coefficients, shocks, ratios, and impulse responses**

   Ludvigson, Ma, and Ng (2021), (∗) Antolin-Diaz and Rubio-Ramirez (2018), Furlanetto, Ravazzolo, and Sarferaz (2019), Arias, Caldara, and Rubio-Ramírez (2019), Kilian and Murphy (2012).

5. **Proxy-SVARs**

   Kilian and Lütkepohl (2017) - chapter 15, (∗) Mertens and Ravn (2013), Stock and Watson (2018), Gertler and Karadi (2015), Caldara and Kamps (2017), (∗) Jarocinski and Karadi (2020), (∗) Wolf (2020), (∗) Känzig (2021), (∗) Miranda-Agrippino and Ricco (2021).

6. **Local Projections**

   Kilian and Lütkepohl (2017) - chapter 12, Jordà (2005), (*) Ramey and Zubairy (2018), Tenreyro and Thwaites (2016), Plagborg-Møller and Wolf (2021), (*) Ascari and Haber (2021), (*) Antolín-Díaz and Surico (forth.), Goncalves, Herrera, Kilian, and Pesavento (2024), (*) Bilan and Kanzig (2024), (*) Ramey (2016), Jordà and Taylor (2024), Montiel-Olea, Plagborg-Moller, Qian, and Wolf (2025).