

Masters Macroeconomics

University of Stellenbosh

First semester 2023

- Course instructor: Guangling Liu
- Time: Wednesdays 8:30-10:30 and Fridays 11:00-13:00
- Venue: Schumann Building 221 and Electronic classroom TBA
- Office: Room 504, Schumann Building
- Office hour: by appointment (you can reach me by phone at 021-808 2238 or preferably by E-mail: gliu@sun.ac.za)

1 Overview

Lucas (1976) argues that the parameters of traditional macroeconometric models depend implicitly on agents' expectations of the policy process and are unlikely to remain stable as policymakers changed their behavior.

In this course, we will study economic theory and macroeconomic models that are based on micro-foundations. Since the rational expectation revolution (Lucas, 1972), macroeconomists have been trying to build a more solid bridge between theoretical and applied work. One notable example is the Kydland and Prescott's (1982) paper, "Time to build and aggregate fluctuations". The Kydland-Precott model is a general equilibrium model, in which individual agents solve their dynamic optimization problems given the preferences, technology, and the market structure. In this remarkable paper, the authors not only introduce the micro-foundations into a general equilibrium macroeconomic model, but also introduce the calibration method in the hope of bringing a wider range of evidence to bear on macroeconomic questions, as Lucas (2007: 4) remarks:

"Macroeconomics is just a lot more interesting today than it was 40 years ago. The level of theoretical modeling is higher, and theory contributes more centrally to empirical

discussion. A much wider range of evidence is brought to bear on quantitative questions in macroeconomics. Science is a social activity and many economists have contributed to these developments, but certainly no one more than [Kydland-Prescott].”

The objective of the course is to provide methodological tools for advanced research in modern business cycle theory, using the neoclassical growth framework to study the economic fluctuations associated with the business cycle. We build macroeconomic models entirely based on micro-foundations, i.e., models in which individual agents’ behaviour is derived from the assumptions on consumers’ preferences, production technologies, and so on. Although the primary focus of the course is on theory, various empirical applications will also be covered in the course.

2 Textbook

I will be using different textbooks and journal articles throughout the course. I have tried my utmost to find one single text to cover all the topics for the course. Unfortunately, it cannot be worked out. However, there are two textbooks that you can reference to, and are worthwhile to keep:

- Walsh, C. E., 2010. Monetary Theory and Policy, 3rd ed. The MIT Press.
- Gali, J., 2008. Monetary Policy, Inflation, and the Business Cycle: An introduction to the New Keynesian Framework. Princeton University Press.

3 Administrative Matters

- Grades: Grades will be based on the term test (20%) on March 15 , group project (30%) due on 19 May, and final exam (50%): date (TBA);
 - It is a mandate to submit a valid medical certificate if a student is sick on the test/exam date. The medical certificate should be submitted to the course con-

venor for midterm test and to Carina Smit for the exam, within 48 hours of missing the assessment. If a valid medical certificate is not received by this deadline, the student will not gain entrance to the sick test opportunity and the module will be deemed incomplete on their academic record. No exceptions will be made.

- If a student misses the midterm test, the student will write on the midterm section of the work together with the final exam at one exam opportunity (i.e. a five-hour exam paper, with a controlled break of half an hour in between). Two separate papers will be provided, but within one session.
 - If a student misses the midterm test and is sick at the first/main exam, the student receives an incomplete for the module. For students who miss the midterm test, the first/main exam opportunity is the final opportunity to pass the module.
 - If a student is sick and submits a valid medical certificate in the first/main exam is allowed to write the supplementary exam (only on the non-midterm part of the work).
 - For requirements to pass the course, refer to the department examination rules. There is no supplementary test for the term test and it is not a requirement to pass the term test to pass the course.
- Class attendance: As graduates, attending class or not is your own business and money. I, however, require you to attend all lectures. This is for your own interests. **Being late is forbidden.**
 - Plagiarism: All work handed in must be your own work. You may exchange ideas with your classmates. Strong action will be taken against plagiarism!

4 Course Outline

4.1 Dynamic Programming

- Namay L. Stockey, Robert E. Lucas Jr., and Edward C. Prescott, 1989. Recursive methods in economic dynamics. Harvard university press (CH 4, 5).

- Krusell macro lecture note. (CH3)

4.2 Linearization

- Dejong, D. N. and C. Dave, 2007. Structural Macroeconometrics. Princeton University Press. (CH 2)
- A Toolkit for analyzing nonlinear dynamic stochastic models easily (by Uhlig Harald).

4.3 Overlapping-Generations Model

- Romer, D., 2006. Advanced Macroeconomics, 3rd ed. McGraw-Hill. (CH 2)
- Diamond, P. A., 1965. National debt in a neoclassical growth model. *American Economic Review*, 55: 1126-1150.

4.4 Asset Pricing

- Sargent, T. J., 1987. Dynamic Macroeconomic Theory. Harvard University Press. (CH 3)
- Cochrane, J. H., 2005. Asset Pricing. Princeton University Press. CH1 (1.1-1.3)

4.5 The Benchmark Real Business Cycle Model

- Kydland, F. E. and E. C. Prescott, 1982. Time to build and aggregate fluctuations. *Econometrica*, 50 (6): 1345-1370.
- Hansen, G. D., 1985. Indivisible labor and the business cycle. *Journal of Monetary economics*, 16: 309-327.
- Cooley, T. F. and E. C. Prescott, 1995. Economic growth and business cycle. In Cooley, T. F., Frontier of business cycle research. Princeton University Press. Princeton, New Jersey, pp 1-38.
- A Toolkit for analyzing nonlinear dynamic stochastic models easily (by Uhlig Harald).

4.6 Money in Flexible Price Environments (CIA)

- Walsh, C. E., 2010. Monetary Theory and Policy, 3rd Ed. The MIT Press. (CH 3)
- Cooley, T. F. and G. D. Hansen, 1989. The inflation tax in a real business cycle model. *American Economic Review*, 79: 733-748.

4.7 Money in Flexible Price Environments (MIU)

- Walsh, C. E., 2010. Monetary Theory and Policy, 3rd Ed. The MIT Press. (CH 2)
- Sidrauski, M., 1967. Rational choice and patterns of growth in a monetary economy. *American Economic Review*, 57(2): 534-544.

4.8 The Benchmark New Keynesian Model (I)

- Walsh, C. E., 2010. Monetary Theory and Policy, 3rd Ed. The MIT Press. (CH 8)
- Gali, J., 2008. Monetary Policy, Inflation, and the Business Cycle: An introduction to the New Keynesian Framework. Princeton University Press. (CH 3)

4.9 The Benchmark New Keynesian Model (II)

- Walsh, C. E., 2010. Monetary Theory and Policy, 3rd Ed. The MIT Press. (CH 8)
- Gali, J., 2008. Monetary Policy, Inflation, and the Business Cycle: An introduction to the New Keynesian Framework. Princeton University Press. (CH 3)

4.10 Optimal Monetary Policy: Dynamic Time Inconsistency

- Walsh, C. E., 2010. Monetary Theory and Policy, 3rd Ed. The MIT Press. (CH 7 & 8.4)
- Gali, J., 2008. Monetary Policy, Inflation, and the Business Cycle: An introduction to the New Keynesian Framework. Princeton University Press. (CH 5)

- Clarida, R., Gali, J., and M. Gertler, 1999. The science of monetary policy: A New Keynesian perspective. *Journal of Economic Literature*, December: 1661-1707.

4.11 Monetary Policy Analysis in MIU & NKM

- Walsh, C. E., 2010. *Monetary Theory and Policy*, 3rd Ed. The MIT Press. (CH 2)
- Gali, J., 2008. *Monetary Policy, Inflation, and the Business Cycle: An introduction to the New Keynesian Framework*. Princeton University Press. (CH 3)
- Sims, C. A., 1992. Interpreting the macroeconomic time series facts: The effects of monetary policy. *European Economic Review*, 36(5): 975-1000.
- Eichenbaum, M., 1992. Comments: “Interpreting the macroeconomic time series facts: The effects of monetary policy by Christopher Sims”. *European Economic Review*, 36(5): 1001-1011.

4.12 Fiscal Policy: Fiscal Stimulus in a Global ZLB Environment

- Walsh, C. E., 2010. *Monetary Theory and Policy*, 3rd Ed. The MIT Press. (CH 4)
- Erceg, C. and J. Linde, 2014. Is there a fiscal free lunch in a liquidity trap? *Journal of the European Economic Association*, 12(1): 73-107.
- Leeper, E. M., Walker, T. B. and S. S. Yang, 2010. Government investment and fiscal stimulus. *Journal of Monetary Economy*, 57: 1000-1012.
- Garcia-Barragan F. and G. Liu, 2018. Great recession, exports crunch, and China’s fiscal stimulus in a global ZLB environment. *Memo*.

4.13 Macro-prudential policy

- Agelini, P., Neri, S. and P. Fabio, 2014. The interaction between capital requirements and monetary policy. *Journal of Money, Credit and Banking*, 46(4): 1073-1111.

- Rubio, M. and J. A. Carrasco-Gallego, 2014. Macro-prudential and monetary policies: implications for financial stability and welfare. *Journal of Banking and Finance*, 49: 326-336.
- Bank for International Settlements (BIS) policy documents.
- South African Reserve Bank (SARB) financial stability review.

4.14 DSGE Model Simulation and Estimation:

4.14.1 Introduction to Matlab and Dynare

4.14.2 Build your very first .mod file

4.14.3 Simulation

4.14.4 Introduction to the estimation of DSGE models

4.14.5 Project: Four practical lab sessions

4.15 Tutorials: a number of tutorial sessions will be announced while we move on with the course