Topics in Macroeconomics

(Optional Course)

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Course Description

This course consists of a selection of topics which have received significant attention by macroeconomists and policymakers in recent times. The emphasis shall be on formal models, especially some of the workhorse models in contemporary macroeconomics. After completing this course, the students will gain an understanding of not only theoretical but also empirical as well as policy discourse in this area, and will also be in a position to explore further in an area of their choice.

Computational methods have become an indispensable part of contemporary macroeconomics, and hence, will form an integral part of this course. Hands-on training will be provided on MATLAB, a popular computer algebra system with macroeconomists. In addition, the students will also be introduced to Dynare, a MATLAB based sofware platform for handling DSGE and OLG models. We will make use of the new state-of-the-art systems in the Computer Lab (Room no. 219) with MATLAB 2018a installed for this purpose. Students are encouraged to extensively use these systems beyond teaching / lab hours in order to maximize gains from this part of the course.

An email group, consisting of institutional email IDs (i.e. in sau.ac.in domain) of students registered for this course is being set up. Important communication regarding lectures, course contents, readings etc. will be circulated through this group. To join this group, either visit the course email group website (mentioned above) or send a join request to tmac2018@econ.sau.ac.in or me. It is your responsibility to remain updated by checking your institutional email regularly.

A brief outline of the course and reading list is provided below. Note that *starred readings are optional*.

Course Outline

1 Introduction

A brief review of a few important developments in contemporary macroeconomics.
Some stylized facts, Great Moderation, Global Financial Crisis, a few contemporary macroeconomic issues.
Readings: Uribe & Schmitt-Grohé (2017) Chapt. 1, Cooley (1995) Chapt. 1, Lucas (1976), *Kydland & Prescott (1977), *Sims (1980).

2 Essential Tools

2.1 Dynamic Programming

Dynamic programming, Bellman equation and policy functions, introduction to stochastic processes and Markov chains, optimal stopping problems, stochastic dynamic programming.
Readings: Adda & Cooper (2003) chapt. 2, *Ljungqvist & Sargent (2012) chapt. 2 & 3.

2.2 Coding and Softwares

Introduction to coding and programming languages, simple numerical exercises using spreadsheets, introduction to MATLAB / GNU Octave, writing simple codes in MATLAB, using MATLAB symbolic toolbox for solving simple problems, numerical solutions to differential equations using Runge-Kutta method (ode45 package), numerical simulation of deterministic and stochastic growth models (using MATLAB), dynamic programming in MATLAB, introduction to Dynare.
Readings: MATLAB & Dynare User guides, Afonso & Vasconcelos (2016), Novales, Fernández & Ruiz (2014).

3 DSGE Models

3.1 Basic DSGE Model

Recursive methods (in deterministic & stochastic models), stochastic growth model with labor-leisure choice: Arrow-Debreu equilibrium vs. recursive competitive equilibrium, log-linearization techniques, linear quadratic dynamic programming and the method of Kydland & Prescott (time permitting), stationary and non-stationary equilibrium dynamnics, inducing stationarity, moving from theory to data, calibration (brief discussion only), Hodrick-Prescott filter, limitations and critiques of equilibrium theories.
Readings: Adda & Cooper (2003) chapt. 5, Cooley (1995) chapt. 1, Uribe & Schmitt-Grohé (2017) chapt. 4, *McCandless (2008) chapt. 4 to 7, Summers (1990), *Kydland & Prescott (1982), *Kydland & Prescott (1990), *King & Rebelo (1999).

3.2 Incomplete Markets

Incomplete markets, uninsured idiosyncratic risks, heterogeneous agents.
Readings: Aiyagiri (1994), *Benhabib, Bisin & Zhu (2015).

3.3 Imperfect Competition, Imperfect Information and Nominal Rigidities

Imperfect competition (Dixit-Stiglitz framework); imperfect information: signal extraction and nominal sluggishness; nominal rigidities: introduction of non-Walrasian features, Gray contract, Fischer contract, Taylor model, Rotemberg model, Calvo model, New Keynesian Phillips curve, New Keynesian Model.
Readings: Bénassy (2011) chapt. 12 & 13, *Novales et al. (2014) chapt. 8.

3.4 Applications

Application to Euro Area, business cycles in emerging markets.
Readings: *Smets & Wouters (2003), *Smets & Wouters (2007), *Ghate, Pandey & Patnaik (2013), *Aguiar & Gopinath (2007), *Neumeyer & Perri (2005).

4 Search and Matching in Labor Market

Introduction to Mortensen-Pissarides model: matching function, job creation, Beveridge curve, wage determination.
Readings: Pissarides (2000) chapt. 1.

5 Selected Themes in Macroeconomics of Financial Markets

Market fundamentals, efficiency of financial markets, asset price (rational) bubbles and crashes, informational inefficiency.
Readings: Fama (1970), Kocherlakota (2008), *Tirole (1985).

6 Beyond DSGE: Alternatives

6.1 Models of Demand-led Growth

Harrodian and post-Keynesian models: investment function and debates around it, role of income distribution, endogeneity of money, Goodwin's growth cycles, Keynes-Metzler-Goodwin disequilibrium models, stock-flow consistent models.
Readings: Blecker (2002), Lavoie (2014) chapt. 6, *Kurz & Salvadori (2011), *Skott (2011).

6.2 Behavioral Macroeconomics & Finance

Departure from rational expectation hypothesis: limits to cognitive abilities, simple models with heuristics, limits of arbitrage, heterogeneous agents: fundamentalists vs. chartists, applications in foreign exchange markets.
Readings: de Grauwe (2012) chapt. 1, *Shleifer & Vishny (1997), *Chiarella, He & Zheng (2013).

6.3 Complexity Economics

(Time permitting) Introduction to complexity theories, out-of-equilibrium dynamics, role of social networks with complex and hierarchial interactions, history dependence, *Santa Fe* approach to complexity and the artificial model of stock market, introduction to Agent-Based-Macroeconomics (ABMs).
Readings: Colander, Holt & Rosser (2004), Arthur (2014).

7 Economics of Monetary Integration

(Time permitting) Theories of optimum currency areas and critiques: costs and benefits of common currency, fragility of incomplete monetary unions, case studies of European Union, crisis within Eurozone area with special reference to a few recent case studies, costs and benefits of the proposed South Asian monetary union.
Readings: de Grauwe (2016).

Evaluation

For M.A. students only

- Presentation (40%): The students pick a paper or a sub-topic/model which is not covered in the class. This paper or topic should ideally be from a list to be circulated in the class, though related topics or papers outside this list also might be chosen in consulation with me. The topic for presentation must be communicated by a date to be announced in the class. *It shall be compulsory for all to attend ALL the presentations.*
- MATLAB Group Assignment (20%): To be completed by groups of two students each.
- End-semester examinations (40%): Two-hour open-book examination based on the papers and topics covered in class.

For Ph.D. students

TBA.

Reference and Further Readings

Adda, J. & Cooper, R. (2003), *Dynamic Economics*, MIT Press, Cambridge, Massachusetts.

Afonso, O. & Vasconcelos, P. B. (2016), *Computational Economics*, Routledge.

Aguiar, M. & Gopinath, G. (2007), 'Emerging market business cycles: The cycle is the trend', *Journal of Political Economy* **115**, 69–102.

Aiyagiri, S. R. (1994), 'Uninsured insurance risk and aggregate saving', *The Quarterly Journal of Economics* **109**(3), 659–684.

Arthur, W. B. (2014), Complexity economics: A new framework for economic thought, *in* W. B. Arthur, ed., 'Complexity Economics', Oxford University Press.

Bénassy, J.-P. (2011), *Macroeconomic Theory*, Oxford University Press, New York.

Benhabib, J., Bisin, A. & Zhu, S. (2015), 'The wealth distribution in Bewley economies with capital income risk', *Journal of Economic Theory* **159**, 489–515.

Blecker, R. (2002), Distribution, demand and growth in neo-kaleckian macro-models, *in* 'The Economics of Demand-Led Growth', Edward Elgar Publishing, chapter 8, pp. 129–152.

Chiarella, C., He, X.-Z. & Zheng, M. (2013), 'Heterogeneous expectations and exchange rate dynamics', *The European Journal of Finance* **19**(5), 392–419.

Colander, D., Holt, R. & Rosser, B. (2004), 'The changing face of mainstream economics', *Review of Political Economy* **16**(4), 485–499.

Cooley, T. F., ed. (1995), *Frontiers of Business Cycles Research*, Princeton University Press.

de Grauwe, P. (2012), *Lectures on Behavioral Macroeconomics*, Princeton University Press.

de Grauwe, P. (2016), *Economics of Monetary Union*, Oxford University Press.

Fama, E. F. (1970), 'Efficient capital markets: A review of theory and empirical work', *The Journal of Finance* **25**(2), 383–417.

Ghate, C., Pandey, R. & Patnaik, I. (2013), 'Has India emerged? business cycle stylized facts from a transitioning economy', *Structural Change and Economic Dynamics* **24**, 157–172.

King, R. G. & Rebelo, S. T. (1999), Resusciating real business cycles, *in* J. Taylor & M. Woodford, eds, 'Handbook of Macroeconomics', Vol. 1, Elsevier Science B.V.

Kocherlakota, N. (2008), 'Injecting rational bubbles', *Journal of Economic Theory* **142**, 218–232.

Kurz, H. D. & Salvadori, N. (2011), The post-keynesian theories of growth and distribution: a survey, in *Handbook of Alternative Theories of Economic Growth* (Setterfield 2011).

Kydland, F. E. & Prescott, E. C. (1977), 'Rules rather than discretion: The inconsistency of optimal plans', *Journal of Political Economy* **87**, 473–492.

Kydland, F. E. & Prescott, E. C. (1982), 'Time to build and aggregate fluctuations', *Econometrica* **50**(6), 1345–1370.

Kydland, F. E. & Prescott, E. C. (1990), 'Business cycles: Real facts and monetary myths', *Federal Reserve Bank of Minneapolis Quarterly Review* .

Lavoie, M. (2014), *Post-Keynesian Economics: New Foundations*, Edward Elgar Publishing Ltd.

Ljungqvist, L. & Sargent, T. J. (2012), *Recursive Macroeconomic Theory*, third edn, MIT Press, Cambridge, Massachusetts.

Lucas, R. E. (1976), 'Econometric policy evaluation: A critique', *Carnegie-Rochester Conference Series on Public Policy* **1**(0), 19 – 46.

McCandless, G. (2008), *The ABCs of RBCs: An introduction to dynamic macroeconomic models*, Harvard University Press, Cambridge, Massachusetts.

Neumeyer, P. A. & Perri, F. (2005), 'Business cycles in emerging economies: the role of interest rates', *Journal of Monetary Economics* **52**(2), 345–380.

Novales, A., Fernández, E. & Ruiz, J. (2014), *Computational Economics*, Routledge.

Pissarides, C. A. (2000), *Equilibrium Unemployment Theory*, 2nd edn, MIT Press, MA.

Setterfield, M. (2011), *Handbook of Alternative Theories of Economic Growth*, Edward Elgar Publishing Ltd.

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Sims, C. A. (1980), 'Macroeconomics and reality', *Econometrica* **48**(1), 1–48.

Skott, P. (2011), Growth, instability and cycles: Harrodian and kaleckian models of accumulation and income distribution, in *Handbook of Alternative Theories of Economic Growth* (Setterfield 2011).

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Smets, F. & Wouters, R. (2007), 'Shocks and frictions in us business cycles: A Bayesian DSGE approach', *American Economic Review* **97**(3), 586–606.

Summers, L. H. (1990), 'Some skeptical observations on real business cycle theory', *Federal Reserve Bank of Minneapolis Quarterly Review* .

Tirole, J. (1985), 'Asset bubbles and overlapping generations', *Econometrica* **53**(6), 1499–1528.

Uribe, M. & Schmitt-Grohé, S. (2017), *Open Economy Macroeconomics*, Princeton University Press.