Macroeconomic theory and methodology

Lectures delivered by V. Kvedaras

1. An overview of historical developments and macroeconomic problems. Features of contemporary macroeconomic methodology:
    a. Economic growth and business cycles.
    b. Macroeconomic schools and their methodological approaches.
    c. Markets and agents, aggregate constraints, objective functions, technological and budget constraints. Ad hoc and optimization-based behavioural equations. Lucas critique.
    d. The role and alternatives of expectations, backward-, forward-looking expectations and the intertemporal optimization, market frictions and imperfections, money neutrality and the Ricardian equivalence.
    e. Problems of aggregation and issues of representative agents. Possibility of analysis of welfare.

Basic literature: [A] Ch.2, [H-P] Ch.1.3 and *Epilogue*.

2. An (IS-LM-)AD-AS:
    a. Static optimization based derivation of short-term production function. Actual and potential output and the aggregate supply function. $y-y^*=\theta(p-w)$ as a log approximation to AS function.
    b. Models of aggregate expenditure ($E=C+G+I+X-M$) and the multiplier effects: alternative functions of private consumption (Keynesian, permanent income), capital accumulation and dynamics of investment (accelerator, Tobin's q); import and export demand functions; equilibrium $Y=E$ and the multiplier effects; the IS function $y=a+\gamma g - \beta r + \psi(p^f+e-p)$ as a log-linear approximation of the equilibrium condition in the market of goods and services.
    c. Money market: exchange rate regimes, supply of money, money demand function, equilibrium in the money market and the LM curve $m-p=\eta y - \lambda i$ as a log-linear approximation. Real and nominal interest rates, actual and expected inflation, Fisher equation.
    d. Wages and backward-looking expectations (naïve, adaptive, rational). Alternative wage setting equations.
    e. Equilibrium in the markets and the IS-LM-AD-AS related system of equations.

Basic literature: [A] Ch.2, [H-P] Ch.1.1-1.2, 4.

3. Development of IS-LM and AD-AS:
    a. Naïve expectations ($p_t^e=p_{t-1}$) and the Keynesian implications: sticky prices, Phillips curve, unemployment, and budget multipliers.
    b. Simple adaptive expectations ($p_t^e= p_{t-1} + \pi_{t-1} => \pi_t^e=\pi_{t-1}$) and the Monetarist's implications: Phelps-Friedman model, NAIRU, inflation acceleration, money growth rate as a single determinant of income growth variability, discrete and rule-based money market policy alternatives.
    c. Targets and operational alternatives of money market policy. Taylor rules and the AD-AS models without the LM curve.
    d. Muth's model-consistent rational expectations ($p_t^e= E_{t-1} p_t$), the Lucas supply function. Natural rate of unemployment. Neutrality of predictable economic policy. The non-existence of systematic (nominal) business cycles.

Basic literature: [A] Ch.2.5-4.4, [H-P] Ch.2.1,3.1-3.2.

4. IS-LM models of open economy:
    a. A small open economy and its features.
    b. Mundell-Fleming model with fixed and flexible exchange rates and their implications for the efficiency of fiscal and monetary policies.

c. Exchange rates and the interest rate parity. Differences in the adjustment speed of real and financial (or nominal) variables and their implications for the financial markets: the Dornbush overshooting model.

Basic literature: [A] Ch.2.4, [H-P] Ch.11.

5. Real business cycle theory
    a. Technology shocks and their relevance for the real business cycle.
    b. General positioning and model formulation: the representative agents, market structure, objective functions and constraints.
    c. The equilibrium: the non-linear system of equations from FOC and all types of constraints with stochastic shocks and intertemporal expectations.
    d. Value function, Bellman equation, Pontryagin maximum principle, the centralized (central planner) and decentralized (market) solutions of the model.

Basic literature: [A] Ch.5, [L-S] Ch.2-3.

6. Real business cycle theory (continued):
    a. The steady-state of the system.
    b. Log-linear approximation.
    c. Calibration of the model and estimation alternatives.
    d. The solution of the linear system with the forward-looking rational expectations; the Blanchard-Khan method and the method of undetermined coefficients.
    e. Adequacy of the model and its usage.
    f. Economic interpretation of the propagation mechanisms of technology shocks in the RBC model.
    g. Effects of fiscal policy.

Basic literature: [C] (2001), [N.a], [N.b], [H-P] Ch.15.

7. New Keynesians:
    a. The questions of involuntary unemployment, wage and price stickiness.
    b. Implications of oligopolistic market structure and monopolistic competition, real and nominal rigidities.
    c. Menu cost and aggregate demand externalities.
    d. Rotemberg's price adjustment costs, Calvo's and Taylor's staggered contracts pricing, and the New Keynesian Phillips curve.
    e. Labour market imperfections and efficiency wages.
    f. Coordination failure.
    g. Other sources of price and wage stickiness and market imperfections in the New Keynesian approaches and the DSGE models (habit formation, liquidity constraints, etc.).
    h. A summary.

Basic literature: [A] Ch.6, [R.b], [H-P] Ch.11.

8. Interim exam

9. Economic growth (Sollow):
    a. Historical overview: models with exogenous and endogenous growth
    b. Growth accounting, Sollow residual, and some empirical findings.
    c. Basic Sollow-Swan model: exogenous processes, system of behavioural, capital accumulation, and equilibrium equations, the implied difference equation.
    d. Implications for the economic growth: analytic and graphic analysis of the effects of parameter changes for the steady-state equilibrium.

e. Analytic and graphic analysis of the stability of the model.

Basic literature: [R.a] Ch.1, [B-M] Ch.10.

10. Sollow-Swan model (continued):
    a. The Golden rule (argmax and graphical)
    b. Sollow model and the convergence hypothesis of open economies: analytics.
    c. Conditional and unconditional beta and sigma convergence.
    d. The empirical evidence on convergence and some puzzles.

Basic literature: [R.a] Ch.1, [B-M] Ch.11.

11. Continuous time dynamic optimization and the Ramsey model:
    a. Dynamic optimization in continuous time.
    b. Ramsey model: agents and their objective functions, constraints, and FOC.
    c. Implications for the economic growth: the steady state of Ramsey's model.
    d. The analysis of disequilibrium.
    e. The effects of government interventions.

Basic literature: [B-M] App.3, [R.a] Ch.2, [B-M] Ch.2.

12. Models with overlapping generations:
    a. The idea, agents and objective functions.
    b. FOC and the constraints.
    c. The general analysis of the steady state with possible multiple equilibriums and their (in)stability.
    d. The case of logarithmic utility function and the Cobb-Douglas production function: steady-state equilibrium and the speed of adjustment.
    e. The economic implications.

Basic literature: [B-M] Ch.4.1-4.2, [H-P] Ch.17.

13. The AK model:
    a. Endogenous growth models.
    b. The AK model and its implications for the economic growth.
    c. The steady-state equilibrium and disequilibrium analysis.
    d. An extended example: a model with human and physical capital.
    e. Economic implications.

Basic literature: [B-M] Ch.4.1-4.2.

14. One-sector endogenous growth models:
    a. A model with knowledge spillovers and learning by doing: the idea and the set up.
    b. The steady-state equilibrium and the disequilibrium analysis.
    c. Endogenous growth due to public expenditure: the idea and the set up.
    d. The steady-state equilibrium and the disequilibrium analysis.
    e. Economic implications.

Basic literature: [B-M] Ch.4.3-4.6.

15. Models with expanding variety:
    a. Agents, their objective functions, and constraints.
    b. R&D process and the general equilibrium.
    c. Pareto optimality and the effects of subsidies.
    d. Romer's model of technological change and its critique.

Basic literature: [B-M] Ch.6.

16. Schumpeterian models of economic growth:
    a. Agents, their objective functions, and constraints.
    b. The innovation process and the quality ladders.
    c. Pareto optimality and the role of subsidies.
    d. A summary.

Basic literature: [B-M] Ch.7.

Basic literature:

[A] Arnold, L.G. (2002). *Business Cycle Theory*, OUP, 1st edition.

[B-M] Barro, R.J., and Sala-i-Martin, X. (2004). *Economic Growth*, MIT, 2nd edition.

[C] Cochraine, J.H. (2001). „Solving real business cycle models by solving systems of first order conditions", http://faculty.chicagobooth.edu/john.cochrane/research/papers/kpr2a.pdf.

[H-P] Heijdra, B.J., and van der Ploeg, F., (2002) *The Foundations of Modern Macroeconomics,* OUP, 1st edition.

[L-S] Ljungqvist, L., and Sargent, T.J. (2000). *Recursive Macroeconomic Theory*, MIT, 1st edition (look rather for the 2nd).

[N.a] Nakajima, M. (2007a) „Solving RBC models with Linearized Euler Equations: Blanchard-Khan Method", http://www.compmacro.com/makoto/note/note_rbc_bk.pdf.

[N.b] Nakajima, M. (2007b) „Solving RBC models with Linearized Euler Equations: Method of Undetermined Coefficients", http://www.compmacro.com/makoto/note/note_rbc_uc.pdf.

[R.a] Romer, D. (2001) *Advanced Macroeconomics*, McGraw Hill, 2nd edition.

[R.b] Roberts, J.M. (1995) „New Keynesian Economics and the Phillips Curve", *Journal of Money, Credit, and Banking* 27(4), 975-984.

Seminar readings

- http://economics.wikia.com/wiki/Is_there_a_core_of_practical_Macroeconomics.
- Solow R.M. (1997). Is There a Core of Usable Macroeconomics We Should All Believe In? *American Economic Review 87(2)*, pp. 230-232.
- Taylor J.B (1997). A Core of Practical Macroeconomics, *American Economic Review 87(2)*, pp. 233-235.
- Eichenbaum M. (1997). Some Thoughts on Practical Stabilization Policy, *American Economic Review 87(2)*, pp. 236-239.
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- Blanchard O. (1997). Is There a Core of Usable Macroeconomics? *American Economic Review 87(2)*, pp. 244-246.
- Romer D. (2000). "Keynesian Macroeconomics without the LM Curve", *Journal of Economic Perspectives 14(2)*, pp. 149-169.
- Tesfatsion L. (2009). „Notes on the Lucas Critique, Time Inconsistency, and Related Issues". http://www.econ.iastate.edu/tesfatsi/luccrit.pdf.
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- Hoover K.D. http://www.cato.org/pubs/journal/cj12n1/cj12n1-6.pdf
- Prescott, E.C. (1986) „Theory Ahead of Business Cycle Measurement", http://minneapolisfed.org/research/sr/sr102.pdf,

http://www.minneapolisfed.org/research/QR/QR1421.pdf ,
http://www.lb.lt/lt/leidiniai/pinigu_studijos2005_1/nobelis04.pdf.

- Kydland F.E. and Prescott, E.C. (1982). „Time to Build and Aggregate Fluctuations“, *Econometrica 50*, pp. 1345-70.
- Ireland P.N. (2004). A method for taking models to the data, *Journal of Economic Dynamics and Control, 28(6)*, pp. 1205-1226.
- Tovar (2008) DSGE models and central banks, http://www.ecb.int/pub/pdf/scpwps/ecbwp171.pdf, http://ec.europa.eu/economy_finance/publications/publication12918_en.pdf, http://www.econ.upenn.edu/~jesusfv/econometricsDSGE.pdf
- Juselius K. and M. Franchi (2007). Taking a DSGE model to the data meaningfully, *Economics No.2007-4.*
- http://www.econlib.org/library/Enc/NewKeynesianEconomics.html
- Blanchard O. bei J. Gali (2008). Labour markets and monetary policy: A New-Keynesian model with unemployment(http://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID920959_code629430.pdf?abstractid=920959&mirid=1)
- Clarida et al. (1999). The science of monetary policy: ANew Keynesian perspective, *Journal of Economic Literature XXXVII, pp. 1661-1707.*
- Mankiw N.G. (2006). The macroeconomist as scientist and engineer, *Journal of Economic Perspectives 20(4)*, pp. 29-46
- White W. (2009). Modern macroeconomics is on the wrong track (http://www.imf.org/external/pubs/ft/fandd/2009/12/pdf/white.pdf)
- Solow R.M. (1988). „Growth Theory and After“, *American Economic Review 78(3)*, pp. 307-317,
- Solow R.M. (1994). „Perspectives on Growth Theory“, *Journal of Economic Perspectives 8(1)*, pp. 45-54.
- Romer P.M. (1994). „The Origins of Endogenous Growth“, *Journal of Economic Perspectives 8(1)*, pp.3-22.
- Benge, M., and G. Wells (2002). „Growth and the Current Account in a Small Open Economy“, *Journal of Economic Education,* spring, pp. 152-165.
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