

DOKTORANTŪROS STUDIJŲ DALYKO SANDAS

Dalyko pavadinimas	Mokslo kryptis (šaka) kodas	Fakultetas	Katedra
<b>Macroeconomics: DSGE models</b>	Ekonomika S 004	Ekonomikos ir verslo administravimo fakultetas Kauno fakultetas	

Studijų būdas	Kreditų skaičius ECTS	Studijų būdas	Kreditų skaičius
paskaitos	1	konsultacijos	
individualus	6	seminarai	

Dalyko anotacija

**Objective of the course:** This course provides the theoretical foundations of macroeconomics. Specifically, macroeconomic dynamic stochastic general equilibrium (DSGE) models will be introduced. Not only will the course cover how to derive those equilibrium models but also how to solve and implement them using numerical methods and computer software.

The first part of the course deals with the simplest kind of dynamic stochastic general equilibrium models: representative agent, representative firm models, i.e. fully homogeneous models. These models are not micro-founded. Before introducing these models, time is devoted to optimization theory and equilibrium concepts. The computer software introduced is called Dynare and with it an implementation of so-called perturbation methods.

The second part of the course leaves this simple, fully homogeneous model world and introduces agent and firm heterogeneity. Moreover, these general equilibrium models will be micro-founded ones. Specifically, New Keynesian (NK) models are first introduced and with them a role for monetary policy, heterogeneous firms, and price rigidities. Next, heterogeneous agent models are introduced. Value function iterations and dynamic programming using the computer software Matlab are the key numerical methods introduced in this part of the course.

**Learning outcomes:** After the course, students will have gained familiarity in optimization theory, expected utility theory, equilibrium theory, basic DSGE models, perturbation methods, the computer software Dynare, basic New Keynesian models, dynamic programming, value function iteration, as well as heterogeneous agent models and how to solve them using the computer software Matlab.

**Course outline:**

a. Basic DSGE Modelling (Dr Patrick Grüning)

- i. Session 1 - Basics (4 hours)
  1. Review of optimization theory and expected utility theory
  2. Equilibrium theory (Pareto efficiency, social planner equilibrium, competitive equilibrium, Arrow-Debreu securities, and welfare theorems)
- ii. Session 2 – Basic DSGE Models (4 hours)
- iii. Session 3 – Introduction to Perturbation Methods and Dynare (4 hours)

- b. New Keynesian and Heterogeneous Agent DSGE Models (Dr Benjamin Hemingway)
- i. Session 4 – Basic New Keynesian Models (4 hours)
  - ii. Session 5 – Global Numerical Methods (4 hours)
    1. Introduction to dynamic programming
    2. Implementation of value function iteration in Matlab
  - iii. Session 6 – Heterogeneous Agent Models (4 hours)
    1. The Bewley/Aiyagari model, an incomplete market, heterogeneous agent model
    2. Solving the Bewley/Aiyagari model in Matlab

**Evaluation (exam and grading):**

- There will be a take-home exam involving both parts of the course with questions on theory and assignments to solve models or exercises with the computer.
- Each of the two parts of the course accounts for 50% of the points on the take-home exam.
- The grade will solely be based on this take-home exam.

Pagrindinē literatūra

**a. Basic DSGE Modelling**

Krueger, D.: Macroeconomic Theory, 2012:

<https://www.ssc.wisc.edu/~aseshadr/econ714/MacroTheory.pdf>

Romer, D.: Advanced Macroeconomics. McGraw-Hill, 2011.

Williamson, S.: Notes on Macroeconomic Theory, 1999:

<http://www.econ.yale.edu/smith/econ510a/notes99.pdf>

Dynare User Guide: <http://www.dynare.org/documentation-and-support/user-guide>

Dynare Manual: <http://www.dynare.org/documentation-and-support/manual>

**b. New Keynesian and Heterogeneous Agent DSGE Models**

Galí, J.: Monetary Policy, Inflation and the Business Cycle: an Introduction to the New Keynesian Framework. Princeton University Press, 2008.

Heer, B., and Maussner, A.: Dynamic General Equilibrium Modeling – Computational Methods and Applications. Springer, 2009.

Miao, J.: Economic Dynamics in Discrete Time. MIT Press, 2014.

Aiyagari, S. R. (1994): Uninsured Idiosyncratic Risk and Aggregate Saving, The Quarterly Journal of Economics, 109(3), 659–684.

Konsultuojančiųjų dėstytojų vardas, pavardė	Mokslo laipsnis	Svarbiausieji darbai mokslo kryptyje (šakoje) paskelbti per pastaruosius 5 metus
<p style="text-align: center;"><b>Patrick Grüning</b></p>	<p>Dr.</p>	<p>(būsimas) Heterogeneity in the internationalization of R&amp;D: Implications for anomalies in finance and macroeconomics. Finance Research Letters.</p> <p>(būsimas) An Experimental Study of Bond Market Pricing. Matthias Weber, John Duffy and Arthur Schram. Journal of Finance.</p> <p>(2018) Structural Labour Market Reforms in the EU-15: Single-country vs. Coordinated Counterfactuals. Povilas Lastauskas, Julius Stakėnas. Structural Change and Economic Dynamics, Vol 44, March 2018, p. 88-99.</p> <p>(2018) Openness and Structural Labour Market Reforms: Ex-ante Counterfactuals. Povilas Lastauskas, Julius Stakėnas. Contemporary Economic Policy.</p> <p>(2017) Racial Discrimination in the US Labor Market: Employment and Wage Differentials by Skill. Linas Tarasonis, Daniel Borowczyk-Martins and Jake Bradley. Labour Economics, Vol 49 (December), p. 106–127.</p> <p>(2017) Evolution of Bilateral Capital Flows to Developing Countries at Intensive and Extensive Margins. Juliana Araujo, Povilas Lastauskas and Chris Papageorgiou. Journal of Money, Credit, and Banking, Vol 49, Issue 7, Pages 1517-1554.</p> <p>(2017) Choosing the Rules: Preferences over Voting Systems for Assemblies of Representatives. Matthias Weber. Journal of Economic Behavior &amp; Organization.</p> <p>(2017) International Endogenous Growth, Macro Anomalies, and Asset Prices. Patrick Grüning. Journal of Economic Dynamics and Control, Volume 78, Pages 118–148.</p> <p>(2016) The Non-Equivalence of Labour Market Taxes: A Real-Effort Experiment. Matthias Weber, Arthur Schram. The Economic Journal.</p> <p>(2016) Heterogeneous Innovation, Firm Creation and Destruction, and Asset Prices. Jan Bena, Lorenzo Garlappi, and Patrick Grüning. Review of Asset Pricing Studies. Volume 6, Issue 1, Pages 46-87.</p> <p>(2016) Labor market dynamics, endogenous growth, and asset prices. Michael Donadelli and Patrick Grüning. Economics Letters, Volume 143, Pages 32-37.</p> <p>(2016) Two-tier voting: Measuring inequality and specifying the inverse power problem. Matthias Weber. Mathematical Social Sciences, Volume 79,</p>

Konsultuojančiųjų dėstytojų vardas, pavardė	Mokslo laipsnis	Svarbiausieji darbai mokslo kryptyje (šakoje) paskelbti per pastaruosius 5 metus
<b>Benjamin Hemingway</b>	Dr.	Hemingway, B., Crawford, A. (in progress) The effect of the financial crisis on bank lending to SMEs joint with Hemingway, B. Macroeconomic implications of insolvency regimes [Under revision] Banking regulation and collateral screening in a model of information asymmetry Hemingway, B. A Model of Credit Rationing in SME Loan Applications

Konsultuojančiųjų dėstytojų vardas, pavardė	Mokslo laipsnis	Svarbiausieji darbai mokslo kryptyje (šakoje) paskelbti per pastaruosius 5 metus
<b>Anh Dinh Minh Nguyen</b>	Dr.	<ol style="list-style-type: none"> <li>1. Nguyen, Anh DM, Luisanna Onnis, and Raffaele Rossi. "The Macroeconomic Effects of Income and Consumption Tax Changes." Sheffield Economic Research Paper Series 2017008 (2017).</li> <li>2. Nguyen, A. D. M., Efthymios, G. P., David, A. P. (2018). Modeling changes in US monetary policy with a time-varying nonlinear Taylor rule. <i>Studies in Nonlinear Dynamics &amp; Econometrics</i>, 22(5).</li> <li>3. Constantinescu, M., &amp; Nguyen, A. D. M. (2017). Unemployment or Credit: Who Holds The Potential? Results From a Small-Open Economy (No. 4). Bank of Lithuania.</li> <li>4. Dridi, J., &amp; Nguyen, A. D. (2019). Assessing Inflation Convergence in the East African Community. <i>Journal of International Development</i>, 31(2), 119-136.</li> <li>5. Nguyen, A. D., Dridi, J., Unsal, F. D., &amp; Williams, O. H. (2017). On the drivers of inflation in Sub-Saharan Africa. <i>International economics</i>, 151, 71-84.</li> <li>6. Samarina, A., &amp; Nguyen, A. D. M. (2018). Does monetary policy affect income inequality in the Euro Area. Mimeo, De Nederlandsche Bank, Amsterdam.</li> <li>7. Nguyen, A. D., Constantinescu, M. (2017). A Century of Gaps. Working Paper: Bank of Lithuania Working Paper Series No 51 (08/2017)</li> <li>8. Nguyen, A. D. (2017). UK Monetary Policy under Inflation Targeting. Working Paper: Bank of Lithuania Working Paper Series No 41 (03/2017)</li> <li>9. Nguyen, A. D., Baranauskaitė, K. (in progress) Intersectoral Network-based Channel of Aggregate TFP Shocks.</li> <li>10. Nguyen, A. D., Baranauskaitė, K. (in progress) Direct and Network Effects of Idiosyncratic TFP Shocks</li> <li>11. Nguyen, A. D. Potential Output in Lithuania – a Joint Measure Using Real and Financial</li> </ol>

		Sector Variables, Lithuanian Economic Review, Bank of Lithuania, Dec 2017 (pp 30-33) 12. Nguyen, A. (2015). Financial frictions and the volatility of monetary policy in a DSGE model.
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Doktorantūros komiteto teikimu patvirtinta fakulteto/instituto taryboje 20\_\_ m.\_\_ mėn.\_\_d. ,  
protokolo Nr.

Tarybos pirmininkas

Pastaba: jei doktorantūros teisė bus suteikta kartu su kita institucija, tvirtinama ne fakulteto taryboje , o jungtinėje komisijoje.