

**LILIA MALIAR**

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**Fields of specialization:**

Numerical Methods, Quantitative Macroeconomics, Monetary Policy, Economic Theory, Economies in Transition, Economic Growth and Development

**Current position:**

Professor, The Graduate Center, City University of New York (CUNY), 2018-

**Current Teaching (CUNY):**

Econ 81500 (Special Topics in Macroeconomics), 2<sup>nd</sup> year PhD

Econ 71200 (Macroeconomic Theory II), 1<sup>st</sup> year PhD

**Associate Editor:**

- Quantitative Economics

**CEPR:**

- Research Fellow

**Adviser:**

- Canadian Central Bank, Model Development Division

**Econometric Society Australasian Meeting (ESAM, 2018):**

- Invited Speaker: "Deep Learning for Solving Dynamic Economic Models"

**Advisory Council:**

- Society for Computational Economics

**Active NSF Grant**

- Analyzing non-stationary and unbalanced growth economic models, SES-1559407, PI-Serguei Maliar, 08/15/2016- 07/31/2019

**Education:**

Ph.D. in Economics, University Pompeu Fabra, Spain, 1999

MA in Economics, Central European University, Czech Republic, 1994

B.A. in Economics, Dnipropetrovsk State University, Ukraine, 1991

**Languages:**

Ukrainian (native), Russian (native), English (fluent), Spanish (fluent)

### **Recent Working Papers:**

1. Lilia Maliar and John Taylor (2018). Forward Guidance: Is It Useful After the Crisis?
2. Lilia Maliar (2018). Continuous Time versus Discrete Time in the New Keynesian Model: Closed-Form Solutions and Implications for Liquidity Trap.
3. Chase Coleman, Spencer Lyon, Lilia Maliar and Serguei Maliar, (2018). “Matlab, Python, Julia: What to Choose in Economics? CEPR working paper DP 13210.
4. Lilia Maliar, Serguei Maliar and Inna Tsener (2018). “Capital-Skill Complementarity: Twenty Years After”. Work in progress.
5. Vadym Lepetuyk, Lilia Maliar and Serguei Maliar (2017), “Should Central Banks Worry about Nonlinearities of Their Large-Scale Macroeconomic Models?”, Bank of Canada staff paper #2017-21.
6. Lilia Maliar, Serguei Maliar and John Taylor (2017). “The Impact of Alternative Transitions to Normalized Monetary Policy”. Work in progress.
7. Laurence Kotlikoff, Seung Lee, Lilia Maliar and Serguei Maliar (2017), “Long-Term Implications of Aging Population in the Macroeconomy”. Work in progress.
8. Lilia Maliar, Serguei Maliar, John Taylor and Inna Tsener (2015). “A Tractable Framework for Analyzing a Class of Nonstationary Markov Models.” *NBER 21155*. Revise and resubmit in *Quantitative Economics*.

### **Publications:**

1. Kenneth L. Judd, Lilia Maliar and Serguei Maliar, (2017). “Lower Bounds on Approximation Errors to Numerical Solutions of Dynamic Economic Models”, *Econometrica* 85 (3), 991-1020.
2. Kenneth L. Judd, Lilia Maliar, Serguei Maliar and Inna Tsener, (2016). “How to Solve Dynamic Stochastic Models Computing Expectations Just Once”, *NBER 17418*, *Quantitative Economics* (forthcoming).
3. Cristina Arellano, Lilia Maliar, Serguei Maliar and Viktor Tsyrennikov, (2016). “Envelope Condition Method with an Application to Default Risk Models”, *Journal of Economic Dynamics and Control* 69, 436-459.
4. Lilia Maliar and Serguei Maliar, (2016). “Ruling out Multiplicity of Smooth Equilibria in Dynamic Games: A Hyperbolic Discounting Example”, *Dynamic Games and Applications* 6(2), 243-261, in special issue "Dynamic Games in Macroeconomics" edited by Edward C. Prescott and Kevin L. Reffett.
5. Lilia Maliar and Serguei Maliar, (2015). “Merging Simulation and Projection Approaches to Solve High-Dimensional Problems with an Application to a New Keynesian model”, *Quantitative Economics* 6, 1-47 (LEAD ARTICLE).
6. Lilia Maliar, (2015). “Assessing Gains from Parallel Computation on Supercomputers”, *Economics Bulletin* 35/1, 159-167.
7. Kenneth L. Judd, Lilia Maliar, Serguei Maliar and Rafael Valero, (2014). “Smolyak Method for Solving Dynamic Economic Models: Lagrange Interpolation, Anisotropic Grid and Adaptive Domain”, *Journal of Economic Dynamics and Control* 44(C), 92-123.
8. Lilia Maliar, Serguei Maliar and Sébastien Villemot, (2013). “Taking Perturbation to the Accuracy Frontier: A Hybrid of Local and Global Solutions”, *Computational Economics* 42(3), pp 307-325.

9. Lilia Maliar and Serguei Maliar, (2013). "Envelope Condition Method versus Endogenous Grid Method for Solving Dynamic Programming Problems", *Economic Letters* 120, pp. 262-266.
10. Kenneth L. Judd, Lilia Maliar and Serguei Maliar, (2011). "Numerically Stable and Accurate Stochastic Simulation Methods for Solving Dynamic Models" and "Supplement", *Quantitative Economics* 2, 173-210.
11. Serguei Maliar, Lilia Maliar and Kenneth L. Judd, (2011). "Solving the Multi-Country Real Business Cycle Model Using Ergodic Set Methods" *Journal of Economic Dynamic and Control* 35(2), pp. 207-228.
12. Lilia Maliar and Serguei Maliar, (2011). "Capital-Skill Complementarity and Steady-State Growth", *Economica* 78, pp. 240-259.
13. Lilia Maliar, Serguei Maliar and Fernando Valli, (2010). "Solving the Incomplete Markets Model with Aggregate Uncertainty Using the Krusell-Smith Algorithm", *Journal of Economic Dynamics and Control* 34, pp. 42-49.
14. Kateryna Garmel, Lilia Maliar and Serguei Maliar, (2008). "The EU Eastern Enlargement and FDI: the Implications from a Neoclassical Growth Model", *Journal of Comparative Economics* 36/2, pp. 307-325.
15. Lilia Maliar, Serguei Maliar and Fidel Perez, (2008). "Sovereign Risk, FDI Spillovers, and Economic Growth", *Review of International Economics* 16/3, pp. 463-477.
16. Dmytro Kylymnyuk, Lilia Maliar and Serguei Maliar, (2007). "Rich, Poor and Growth-Miracle Nations: Multiple Equilibria Revisited", *BE Journals in Macroeconomics, Topics in Macroeconomics*: Vol. 7: No. 1, Article 20.
17. Dmytro Kylymnyuk, Lilia Maliar and Serguei Maliar, (2007). "A Model of Unbalanced Sectorial Growth with Application to Transition Economies", *Economic Change and Restructuring* 40/4, pp. 309-325.
18. Lilia Maliar and Serguei Maliar, (2007). "Short-Run Patience and Wealth Distribution", *Studies in Nonlinear Dynamics and Econometrics*, Vol.11: No. 1, Article 4.
19. Lilia Maliar and Serguei Maliar, (2006). "The Neoclassical Growth Model with Heterogeneous Quasi-Geometric Consumers", *Journal of Money, Credit, and Banking* 38(3), pp. 635-654.
20. Lilia Maliar and Serguei Maliar, (2006). "Indeterminacy in a Log-Linearized Neoclassical Growth Model with Quasi-Geometric Discounting", *Economics Modelling* 23/3, pp. 492-505.
21. Lilia Maliar and Serguei Maliar, (2005). "Solving the Neoclassical Growth Model with Quasi-Geometric Discounting: A Grid-Based Euler-Equation Method", *Computational Economics* 26, pp. 163-172.
22. Lilia Maliar, Serguei Maliar and Juan Mora, (2005). "Income and Wealth Distributions Along the Business Cycle: Implications from the Neoclassical Growth Model", *BE Journals in Macroeconomics, Topics in Macroeconomics* Vol. 5: No. 1, Article 15.
23. Lilia Maliar and Serguei Maliar, (2005). "Solving Nonlinear Stochastic Growth Models: an Algorithm Computing Value Function by Simulations", *Economics Letters* 87, pp. 135-140.
24. Dmytro Boyarchuk, Lilia Maliar and Serguei Maliar, (2005). "The Consumption and Welfare Implications of Wage Arrears in Transition Economies", *Journal of Comparative Economics* 33(3), pp. 540-567.
25. Lilia Maliar and Serguei Maliar, (2005). "Parameterized Expectations Algorithm: How to Solve for Labor Easily", *Computational Economics* 25, pp. 269-274.

26. Lilia Maliar and Serguei Maliar, (2004). "Endogenous Growth and Endogenous Business Cycles", *Macroeconomic Dynamics* 8/5, pp. 1-23.
27. Lilia Maliar and Serguei Maliar, (2004). "Indivisible Labor, Lotteries and Idiosyncratic Productivity Shocks", *Mathematical Social Sciences* 48, pp. 23-35.
28. Lilia Maliar and Serguei Maliar, (2004). "Preference Shocks from Aggregation: Time Series Data Evidence", *Canadian Journal of Economics* 37/3, pp. 768-781.
29. Lilia Maliar and Serguei Maliar, (2004). "Quasi-Geometric Discounting: a Closed-Form Solution under the Exponential Utility Function", *Bulletin of Economic Research* 56/2, pp. 201-206.
30. Lilia Maliar and Serguei Maliar, (2003). "Quasi-Linear Preferences in the Macroeconomy: Indeterminacy, Heterogeneity and the Representative Consumer", *Spanish Economic Review* 5, pp. 251-267.
31. Lilia Maliar and Serguei Maliar, (2003). "The Representative Consumer in the Neoclassical Growth Model with Idiosyncratic Shocks", *Review of Economic Dynamics* 6, pp. 362-380.
32. Lilia Maliar and Serguei Maliar, (2003). "Parameterized Expectations Algorithm and the Moving Bounds", *Journal of Business and Economic Statistics* 21/1, pp. 88-92.
33. Lilia Maliar and Serguei Maliar, (2001). "Heterogeneity in Capital and Skills in a Neoclassical Stochastic Growth Model", *Journal of Economic Dynamics and Control* 25/9, pp. 1367-1397.
34. Lilia Maliar and Serguei Maliar, (2000). "Differential Responses of Labor Supply Across Productivity Groups", *Journal of Macroeconomics*, 22, pp. 85-108.

#### **Books and Chapters:**

1. Lilia Maliar and Serguei Maliar, (2014). "Numerical Methods for Large Scale Dynamic Economic Models", in: Schmedders, K. and K.L. Judd (Eds.), *Handbook of Computational Economics*, Volume 3, Chapter 7, 325-477, Amsterdam: Elsevier Science.
2. Kenneth L. Judd, Lilia Maliar and Serguei Maliar "Ergodic Set Methods for Solving Dynamic Economic Models": Aimed to be an up-to-date manuscript on numerical methods for solving dynamic economic models. Under a contract with *MIT Press* with approximate size of 300 pages.
3. Lilia Maliar and Serguei Maliar, "Dynamic Macroeconomics: A Primer". Aimed to be an introduction to dynamic macroeconomics at a beginning and intermediate graduate levels. Under a contract with *Cambridge University Press* with approximate size of 400 pages.

#### **Teaching experience:**

Visiting Associate Professor, Department of Economics, Stanford University, 2013-2018

Econ 288 (Computational Economics), 2<sup>nd</sup> year PhD

Econ 202N (Microeconomics), 1<sup>st</sup> year PhD

Econ 203N (Game Theory), 1<sup>st</sup> year PhD

Econ 160 (Game Theory), intermediate undergraduate

Associate Professor (2007-2013), Professor "Ramón y Cajal" (2003-2007), Assistant Professor (1999-2003), University of Alicante, Spain

Graduate (in English): Macroeconomics I, II, III, 1<sup>st</sup> year PhD

Growth Theory, 1<sup>st</sup> year PhD

Math boot camp, 1<sup>st</sup> year PhD

Advanced Macroeconomics 2<sup>nd</sup> year PhD

Undergraduate (in Spanish):   Introducción a la economía I

  Macroeconomía I

  Economía Monetaria y Bancaria

Visiting Professor, MA in Economics, EERC at the National University “Kyiv-Mohyla Academy”, Ukraine, 2001-2010, (2 months per year)

  Macroeconomics I (Growth Theory) 1<sup>st</sup> year

  Advanced Macroeconomics (RBC theory) 2<sup>nd</sup> year

Teaching Assistant, University Pompeu Fabra, Spain, 1996-1999

Associate professor, Zaporozhye State University, Ukraine, 1992-1993

### **Workshops, Mini-courses and Visiting Teaching**

- Visiting faculty, Macro III and Advanced Macro PhD courses at University of Alicante in spring of 2013-2018 academic years.
- Visiting faculty, new Initiative for Computational Economics (nICE), Hoover Institution, Stanford University, August 2018.
- One week intensive course “Solution Methods for State-Dependent and Time-Dependent Models”, Federal Reserve Board, Washington, August 2017 (jointly with Lilia Maliar).
- One day pre-conference workshop on solving state-dependent and time-dependent models, Society of Computational Economics, New York, USA, 2017
- Five-day mini-course on numerical methods, Indiana University, Bloomington, USA, 2015
- One day pre-conference workshop on numerical analysis in economics, Society of Computational Economics, Oslo, Norway, June 2014.
- Visiting Researcher, Hoover Institution, Stanford University, 2008-2013.
- Visiting Professor, Master Program in Economics, University of Bilbao, Spain, Graduate course: Macroeconomics I, 2007, 2010.

### **PhD thesis advising:**

- Inna Tsener "Numerical Methods for Analyzing Nonstationary Dynamic Economic Models and Their Applications" (graduated 2015).
- Rafael Valero "Essays on Sparse-Grids and Statistical-Learning Methods in Economics" (graduated 2017).
- Rafael Serrano "Essays on Capital-Skill Complementarity" (expected graduation 2019).

### **MA thesis advising:**

I served as an advisor of more than 30 MA theses.

### **Referee:**

Computational Economics; Econometrica; Economica; Economic Journal, Journal of Business and Economic Organization; Journal of Comparative Economics; Journal of Economic Dynamics and Control; Journal of Macroeconomics; Journal of Money, Credit, and Banking; Journal of Political Economy, Journal of Public Economics, Quantitative Economics, Scandinavian Journal of Economics; Spanish Economic Review

**Selected Conferences with Presentations (since 2011):**

Society for Computational Economics, (San Francisco, US, 2011); Bag lunch seminar, (Stanford, US, 2011), UC at Berkeley, (Berkeley, US, 2011); University of Santa Clara, (Santa Clara, US, 2011); Federal Reserve Bank of San Francisco (San Francisco, US, 2011); Universidad Autónoma de Barcelona (Barcelona, España, 2013); Society for Computational Economics, (Vancouver, Canada, 2013); Stanford Summer Workshop on Computational Economics, (Stanford, US, 2013), Central Bank of Sweden (Stockholm, Sweden, 2014), Society for Computational Economics, (Oslo, Norway, 2014); Stanford Institute for Theoretical Economics, (Stanford, US, 2014); Canadian Central Bank (Ottawa, Canada, 2014); Conference on nonlinearities in macroeconomics and finance in the light of crises co-organized by the European Central Bank, the Euro Area Business Cycle Network and the Federal Reserve Bank of Atlanta, (Frankfurt, Germany, 2014); University of California at Santa Cruz, (Santa Cruz, USA, 2015); Society for Computational Economics, (Taipei, Taiwan, 2015); World Congress of the Econometric Society, (Montreal, Canada, 2015); Indiana University, (Bloomington, USA, 2015), Consumer Financial Protection Bureau and International Monetary Fund workshop on heterogeneous agent modeling, (Washington, USA, 2015), University of Alicante, (Alicante, Spain, 2016), Society for Computational Economics, (Bordeaux, France, 2016), Federal Reserve Bank of Dallas, (Dallas, USA, 2016), ASSA (Chicago, USA, 2017, session organizer), CEPR MMCN Conference (Frankfurt, Germany, 2017), Society for Computational Economics (New York, USA, 2017), West Coast Workshop in International Finance (Santa Clara, USA, 2017); Society for Computational Economics, (Milan Italy, 2018); Econometric Society Australasian Meeting (Oakland, New Zealand, 2018).