

**Macro Models with Exogenous and Endogenous Incomplete Markets**  
EUI, FALL 2019, HALF-CREDIT

**Instructor:** Árpád Ábrahám, Office: TBD, E-mail: Arpad.Abraham@bristol.ac.uk.

**Time and Location:** November 11, 11-13.00; November 12, 9.00-11.00; November 20, 13.30-15:30; November 21, 11.00-13.00; November 22, 1:30-3:30. Room: check in the calendar. Extra programming classes: TBA.

**Office Hours:** By appointment or Doodle sign-up.

**Teaching Assistant:** TBD.

**Course website:** There will be a course website on Moodle (if it still exists).

**Course Overview:** This course introduces some new classes of models and applications where agents face idiosyncratic shocks in a dynamic (general equilibrium) context. We will mostly concentrate on models where these shocks cannot be fully insured either because of the lack of (complete) insurance markets (exogenous incomplete markets) and/or because of lack of commitment or private information frictions (endogenous incomplete markets).

The course will cover

- methodological issues such as: defining recursive stationary equilibrium, recursive formulation of dynamic contracts with limited commitment and/or hidden information/action;
- quantitative issues such as: solving dynamic equilibrium or social planning models under discrete and continuous state space using value function or policy function iterations; solving life-cycle models; computing transitional dynamics of economies with heterogeneous agents.
- and applications such as: capital income taxation, consumer or firm default, international risk sharing, consumption and earning inequality, optimal labor contracts, hidden storage, optimal unemployment insurance.

**Grading:** There will be 2 assignments throughout the term. The problem sets will contain analytical, numerical and open-ended questions. For the numerical parts, the basic knowledge of Matlab (or more sophisticated programming languages such as Fortran, C or C++) and methods taught during the first year will be assumed. The open-ended questions needed to be answered individually and they contribute 40 percent of the total grade.

**Readings:** I will provide lecture notes extensively. A preliminary reading list is provided below.

Preliminary Reading List (we will not cover all these papers and we may not follow this order)

## Exogenous Incomplete Markets

- D. R. Aiyagari, Uninsured Idiosyncratic Risk and Aggregate Saving, *Quarterly Journal of Economics* 109(3), (1994), 659-684.
- Castaneda A., Diaz Gimenez, J. and J. V. Rios-Rull (2003). "Accounting for earnings and wealth inequality", *Journal of Political Economy*, 111(4), pp. 818-857.
- Conesa, J.C, Kitao S., and D. Krueger (2009). "Taxing Capital? Not a Bad Idea After All!", *American Economic Review*, 99:1, 25-48.
- Domeij, D., and J. Heathcote (2004): "On the Distributional Consequences of Reducing Capital Taxes", *International Economic Review*, Vol. 45, No. 2.
- M. Huggett, (1993) "The Risk Free Rate in Heterogeneous-Agent, Incomplete-Agent Economies", *Journal of Economic Dynamics and Control* 17(5-6), 953-969.
- Ljungqvist, L. and T. J. Sargent (2004): "Recursive Macroeconomic Theory", *The MIT Press*, 3rd Edition, Chapters 17 and 18.

## Defaultable Debt

- Ábrahám, Á. and E. Cárceles-Poveda (2010), “Endogenous Trading Constraints with Incomplete Asset Markets”, *Journal of Economic Theory*, 145: 974-1004.
- Arellano, Cristina. 2008. “Default Risk and Income Fluctuations in Emerging Economies.” *American Economic Review*, 98(3): 690–712.
- Chatterjee, S., Corbae D., Nakajima, M. and J. V. Rios-Rull (2007). “A Quantitative Theory of Unsecured Consumer Credit with Risk of Default”, *Econometrica*, 75(6), pp. 1525-1590.
- Cooley, T. and V. Quadrini: “Financial Markets and Firm Dynamics”, *American Economic Review*, 91, December 2001.

## Recursive Contracts

- Abreu, D., D. Pearce and E. Stachetti (1990): “Towards a Theory of Discounted Repeated Games with Imperfect Monitoring”, *Econometrica*, 58(5):1041-1064.
- Marcet, A. and R. Marimon (2011): “Recursive Contracts”, European University Institute Working Paper.
- Ljungqvist, L. and T. J. Sargent (2004): “Recursive Macroeconomic Theory”, *The MIT Press*, 3rd Edition, Part 5.

## Optimal Risk Sharing without Commitment

- Ábrahám, Á. and S. Laczó (2018): Efficient Risk Sharing with Limited Commitment and Storage, *Review of Economic Studies* 85(3), pp. 1389-1424..
- Alvarez, F. and U. Jermann, (2000), “Efficiency, Equilibrium, and Asset Pricing with Risk of Default”, *Econometrica*, 68(4), pp. 775-797.
- Alvarez, F. and U. Jermann, (2001), “Quantitative Asset Pricing Implications of Endogenous Solvency Constraints”, *Review of Financial Studies*, 14(4), pp. 1117-1151.
- Kehoe, P. and F. Perri (2002): “International Business Cycles with Endogenous Incomplete Markets“, *Econometrica*, 70(3): 907-28.
- Kehoe, T. and D. K. Levine (2001): “Liquidity Constrained Markets versus Debt Constrained Markets“, *Econometrica*, 69(3): 575-598.
- Kocherlakota, N. (1996): “Implications of Efficient Risk Sharing without Commitment“, *Review of Economic Studies*, 63(4): 595-609.
- Krueger, D. and F. Perri (2005): “Does Income Inequality Lead to Consumption Inequality? Evidence and Theory“, *Review of Economic Studies*, Vol. 73(1), pp. 163-193.
- Ljungqvist, L. and T. J. Sargent (2004): “Recursive Macroeconomic Theory”, *The MIT Press*, 3rd Edition, Chapters 20, 21.
- Thomas, J. and T. Worrall (1988): “Self-Enforcing Wage Contracts“, *Review of Economic Studies*, 55(3): 541-54.er 19.

## Optimal Policies with Hidden Effort

- Atkeson A. (1991): "International Lending with moral Hazard and Risk of Repudiation", *Econometrica*, 59(4): 1069-1089.
- Hopenhayn, H. and J.P. Nicolini (1997), "Optimal Unemployment Insurance," *Journal of Political Economy*, 105(2): 412-438.
- Pavoni, N. (2006): "On Optimal Unemployment Compensation," *Journal of Monetary Economics*, 2007, 54: 1612-1630.
- Pavoni, N. and Violante G. (2006): "Optimal Welfare-to-Work Programs," *Review of Economic Studies*, 2007, 74, January: 283-318.
- Rogerson, W. (1985a), "Repeated Moral Hazard," *Econometrica*, 53: 69-76.

## Hidden Borrowing and Lending and Hidden Information

- Abraham, Á. and N. Pavoni (2008): "Efficient Allocations with Moral Hazard and Hidden Borrowing and Lending: A Recursive Formulation", *Review of Economic Dynamics*, 11: 781-803..
- Abraham, Á., Sebastian Koehne, and N. Pavoni (2010) "On The First-Order Approach in Principal-Agent Models with Hidden Borrowing and Lending," *Journal of Economic Theory* 146, 1331-1361..
- Cole, H. L. and N. R. Kocherlakota (2001): "Efficient Allocations with Hidden Income and Hidden Storage", *Review of Economic Studies*, 68(3): 523-542.
- Kocherlakota, N. R. (2004), "Figuring out the impact of hidden savings on optimal unemployment insurance", *Review of Economic Dynamics*, 7(3): 541-554.
- Ljungqvist, L. and T. J. Sargent (2004): "Recursive Macroeconomic Theory", *The MIT Press*, 3rd Edition, Chapter 20.

## Numerical methodology

- Judd, K.L. (1998), "Numerical Methods in Economics", *MIT Press*.
- Marimon, R. and A.J. Scott, eds. (1998): "Computational Methods for the Study of Dynamic Economies", *Oxford University Press*, Chapters 5, 6 and 11.