

IWH-DPE/CGDE

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**30 March to 2 April 2015**

**30 March to 1 April: 9:30-12:00 pm and 13:00-16:00 pm / 2 April: 9:00-12:00 pm**

## SPECIAL COURSE

### DYNAMIC MACROECONOMICS WITH HETEROGENEOUS AGENTS: SOLUTION METHODS AND APPLICATIONS

#### Course outline

Many interesting economic problems in macroeconomics have to be analysed under the empirically plausible assumption that markets are incomplete so that agents are heterogeneous. Analysing these problems with dynamic stochastic equilibrium models requires numerical approximation. This course introduces PhD students to methods which allow such numerical approximation. These methods are then applied to solve and simulate workhorse models for economies with incomplete markets. Participants will also learn about stylized empirical facts which are then interpreted and analysed with formal models.

The course deals with the following topics:

1. dynamic programming
  - introduction
  - some solution methods
2. application to models with exogenously incomplete markets
  - stylised facts and puzzles
  - the life-cycle model with exogenous market incompleteness
  - liquidity constraints
  - precautionary savings
  - computation of equilibrium
  - joint analysis of durable and non-durable consumption
    - the role of non-separable preferences
    - adjustment costs
    - durables as collateral
  - debt and bankruptcy
3. models with endogenous market incompleteness
  - limited commitment
  - asymmetric information

#### Venue

Halle Institute for Economic Research (IWH)  
Kleine Maerkerstrasse 8  
06108 Halle (Saale)  
conference room (ground floor)

#### Registration

Please contact Annett Hartung, Phone: +49 345 7753 751, E-mail: [annett.hartung@iw-halle.de](mailto:annett.hartung@iw-halle.de), until 30 January 2015.

IWH Doctoral Programme  
in Economics

The following books provide an accessible introduction and background to some of the covered topics:

**Bagliano, Fabio-Cesare; Bertola, Giuseppe** (2004): *Models for Dynamic Macroeconomics*, Oxford University Press, chapter 1.

**Bertola, Giuseppe; Disney, Richard; Grant, Charles** (2006): *The Economics of Consumer Credit*, MIT Press.

**Davis, Morris** (2009): *Macroeconomics*, Cambridge University Press, chapter 3.

**Deaton, Angus** (1992): *Understanding Consumption*, Oxford University Press.

**Gollier, Christian** (2001): *The Economics of Risk and Time*, MIT Press.

## Further readings

### 1. Dynamic programming

**Carroll, Christopher D.** (2006): The Method of Endogenous Gridpoints for Solving Dynamic Stochastic Optimization Problems, *Economics Letters*, Vol. 91, 312-320.

**Hintermaier, Thomas; Koeniger, Winfried** (2010): The Method of Endogenous Gridpoints with Occasionally Binding Constraints among Endogenous Variables, *Journal of Economic Dynamics & Control*, Vol. 34, 2074-2088.

**Judd, Kenneth L.** (1998): *Numerical Methods in Economics*, MIT Press, Cambridge, Massachusetts.

**Ljungqvist, Lars; Sargent, Thomas J.** (2013): *Recursive Macroeconomic Theory*, MIT Press, Cambridge, Massachusetts.

**Stokey, Nancy L.; Lucas, Robert E.** (1989): *Recursive Methods in Economic Dynamics*. Harvard University Press, Cambridge, Massachusetts.

### 2. Application to models with exogenously incomplete markets

**Aiyagari, S. Rao** (1994): Uninsured Idiosyncratic Risk and Aggregate Savings, *Quarterly Journal of Economics*, Vol. 109, 659-684.

**Attanasio, Orazio** (1999): Consumption, *Handbook of Macroeconomics*, Vol. 1B, chapter 11, 741-812.

**Attanasio, Orazio; Davis, Steve** (1996): Relative Wage Movements and the Distribution of Consumption, *Journal of Political Economy*, Vol. 104, 1227-1262.

**Attanasio, Orazio; Weber, Guglielmo** (2010): Consumption and Saving: Models of Intertemporal Allocation and their Implications for Public Policy, *Journal of Economic Literature*, Vol. 48, 693-751.

**Carroll, Christopher D.** (1997): Buffer-Stock Saving and the Life Cycle/Permanent Income Hypothesis, *Quarterly Journal of Economics*, Vol. 112, 1-55.

**Deaton, Angus** (1991): Saving and Liquidity Constraints, *Econometrica*, Vol. 59, 1221-1248.

**Fernández-Villaverde, Jesús; Krueger, Dirk** (2011): Consumption and Saving over the Life Cycle: How Important are Consumer Durables?, *Macroeconomic Dynamics*, Vol. 15, 725-770.

**Gourinchas, Pierre-Olivier; Parker, Jonathan A.** (2002): Consumption over the Life Cycle, *Econometrica*, Vol. 70, 47-89.

### Debt and bankruptcy

**Athreya, Kartik** (2002): Welfare Implications of the Bankruptcy Reform Act of 1999, *Journal of Monetary Economics*, Vol. 49, 1567-1595.

**Chatterjee, Satyajit; Corbae, Dean; Nakajima, Makoto; Ríos-Rull, José-Víctor** (2007): A Quantitative Theory of Unsecured Credit with Risk of Default, *Econometrica*, Vol. 75, 1525-1589.

**Livshits, Igor; MacGee, James; Tertilt, Michele** (2007): Consumer Bankruptcy: A Fresh Start, *American Economic Review*, Vol. 97 (1), 402-418.

**Hintermaier, Thomas; Koeniger, Winfried** (2011): Debt Portfolios, CEPR Discussion Paper No. 8359, IZA Discussion Paper No. 5653.

### 3. Endogenous incomplete markets

- Ábrahám, Árpád; Pavoni, Nicola** (2005): The Efficient Allocation of Consumption under Moral Hazard and Hidden Access to the Credit Market, *Journal of the European Economic Association*, Vol. 3, 370-381.
- Ábrahám, Árpád; Pavoni, Nicola** (2008): Efficient Allocations with Moral Hazard and Hidden Borrowing and Lending: A Recursive Formulation, *Review of Economic Dynamics*, Vol. 11, 781-803.
- Ábrahám, Árpád; Koehne, Sebastian; Pavoni, Nicola** (2011): On the First-Order Approach in Principal-Agent Models with Hidden Borrowing and Lending, *Journal of Economic Theory*, Vol. 146, 1331-1361.
- Bertola, Giuseppe; Koeniger, Winfried** (2010): Public and Private Insurance with Costly Transactions, CEPR Discussion Paper No. 8062, IZA Discussion Paper No. 5201.
- Cole, Harold; Kocherlakota, Narayana** (2001): Efficient Allocations with Hidden Income and Hidden Storage, *Review of Economic Studies*, Vol. 68, 523-542.
- Golosov, Mikhail; Tsyvinski, Aleh** (2007): Optimal Taxation with Endogenous Insurance Markets, *Quarterly Journal of Economics*, Vol. 122, 487-534.
- Kocherlakota, Narayana** (2004): Figuring out the Impact of Hidden Savings on Optimal Unemployment Insurance, *Review of Economic Dynamic*, Vol. 7, 541-554.
- Kocherlakota, Narayana** (2010): *New Dynamic Public Finance*, Princeton University Press.
- Krueger, Dirk; Perri, Fabrizio** (2006): Does Income Inequality Lead to Consumption Inequality? Evidence and Theory, *Review of Economic Studies*, Vol. 73, 163-193.
- Pauly, Mark V.** (1974): Overinsurance and Public Provision of Insurance: The Roles of Moral Hazard and Adverse Selection, *Quarterly Journal of Economics*, Vol. 88, 44-62.
- Rogerson, William P.** (1985): Repeated Moral Hazard, *Econometrica*, Vol. 53, 69-76.