

**COURSE NAME**

**Topics in Macroeconomics III:  
MODELING INFORMATION, LEARNING AND EXPECTATIONS**

**PROFESSOR/S**

**Prof. Kristoffer Nimark**  
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**PROGRAM**

*Master in Economics*

**TERM**

3

**ECTS**

6

**HOURS**

40

**OVERVIEW  
(Objectives)**

Many economic decisions depend on expectations about either inherently unobservable variables or about future realizations of a variable. Different theories of expectations formation will therefore have different implications for economic behavior. This course aims at equipping students with the tools needed to model alternative theories to the full information rational expectations hypothesis. The substantive results from the literature will be discussed along with the specific techniques that were employed to derive them. Lecture notes will be provided, but reading articles will also be required.

**COURSE OUTLINE**

**1. Overview and some basics**

- a. Overview
- b. Linear projections, information sets and conditional expectations
- b. The Kalman filter

**2. Models of imperfect information**

- a. Island models
- b. Private and public information
- c. Higher order expectations
- d. The information revealed by markets
- e. Endogenous information choice

**3. Bounded rationality and learning**

- a. Modeling economic agents as econometricians
- b. Learning, policy making and Bayesian robustness

**EXERCISES AND  
REQUIRED  
ACTIVITIES**

Lecture notes and articles will be provided.

**EVALUATION  
SYSTEM**

Grades will be based on 2 homework assignments with in class presentations (2x10%) and a final exam (30%)

**REFERENCES**

Lecture 1  
Overview and some basics  
[Lecture Notes on Difference Equations](#)  
[Lecture Notes on Solving RE models](#)

Lecture 2  
The Kalman Filter

[Lecture Notes on the Kalman Filter](#)

Lecture 3

Island Models

[Lecture Notes on Lucas Island model](#)

[Some international evidence on output-inflation tradeoffs](#), Lucas, AER (1973)

[A theory of demand shocks](#), Lorenzoni, AER 2009

Lecture 4

Private and Public Information

[Lecture Notes Private and Public Information](#)

[Social Value of Public Information](#), Morris and Shin, AER (2002)

[Social Value of Public Information: Comment: Morris and Shin \(2002\) is actually pro transparency, not con](#), Svensson, AER (2006)

[Social Value of Public Information: Comment: Morris and Shin \(2002\) is actually pro transparency, not con: A Reply](#), Morris, Shin and Tong, AER (2006)

Lecture 5

Higher Order Expectations

[Slides](#)

[Forecasting the forecasts of others](#), Townsend, JPE (1983)

[Dynamic Higher Order Expectations](#), Nimark (2010)

Lecture 6

The Information Revealed by Prices

[Lecture Notes on The Information Revealed by Prices](#)

[On the impossibility of informationally efficient markets](#), Grossman and Stiglitz, AER (1980)

Lecture 7

Endogenous Information Choice

[Rational Inattention](#), Palgrave entry by Wiederholt

[Optimal Sticky Prices under Rational Inattention](#), Mackowiak and Wiederholt, AER (2009)

[Slides](#)

Lecture 8

Bounded Rationality and Learning

[Evolution and Intelligent Design](#), Sargent, AER (2008)

[Lecture Notes on Bounded Rationality and Learning](#)

Lecture 9

Bayesian Robustness and Learning

[The Conquest of U.S. Inflation: Learning and Robustness to Model Uncertainty](#), Cogley and Sargent, RED (2005)

**COURSE NAME**                      **TOPICS IN MACROECONOMICS III**

**PROFESSOR/S**                      **Vasco M. Carvalho**  
vcarvalho@crei.cat

**PROGRAM**                              *Master in Economics*

**TERM**                                      Spring                      **ECTS**                                      **HOURS**                                      20

**OVERVIEW (Objectives)**                      This is a graduate course in the second year macroeconomics field. The class will draw from recent material at the intersection of Industrial Organization and Macroeconomics. In particular, we will consider the implications of theories of firm size and firm dynamics on aggregate outcomes. On the methods side, we will review some theoretical and computational tools that are ideally suited for analyzing dynamic economic models featuring extensive heterogeneity at the micro level – in particular across firms (e.g. productivity, size or survival rate) – while still delivering sharp theoretical restrictions on aggregate outcomes.

**COURSE OUTLINE**

- I. Industry Equilibrium, Firm Dynamics, and Entry and Exit
  - I.1. Entry, Exit and Size Distributions: A Quick Look at the Data
  - I.2. The Selection Effect as a Basic Modeling Tool
  - I.3. Incorporating Financial Market Imperfections
  - I.4. Human capital and innovation
- II. Firms and Aggregate Fluctuations
- III. Firms, Misallocation and Aggregate TFP

**EXERCISES AND REQUIRED ACTIVITIES**                      Problem sets, course project and class participation.

**EVALUATION SYSTEM**                      30% Problem sets, 70% Course project

**REFERENCES**

**I. Industry Equilibrium, Firm Dynamics, and Entry and Exit**

**I.1. Entry, Exit and Size Distributions: A Quick Look at the Data**

Axtell, 2001, “[Zipf Distribution of US Firm Sizes](#)”, *Science*, 293:1818-1820.

Bartelsman, Scarpetta and Schivardi, 2005, “[Comparative Analysis of Firm Demographics and Survival: Evidence from Micro-level sources in OECD countries](#),” *Industrial and Corporate Change*, 14:3, 365-391.

Dunne, Roberts and Samuelson, 1989. “[The Growth and Failure of U.S. Manufacturing Plants](#),” *Quarterly Journal of Economics*, 104(4):671-98.

Dunne, Roberts, Samuelson, 1989, “[Plant Turnover and Gross Employment Flows in the U.S. Manufacturing Sector](#),” *Journal of Labor Economics*, 7 (1):48-71.

**Further readings:**

Bartelsman and Doms, 2000, “[Understanding Productivity: Lessons from Longitudinal Microdata](#),” *Journal of Economic Literature*, 38:3, 569-594

Foster, Haltiwanger and Kirzan, 2001, “[Aggregate Productivity Growth: Lessons from Microeconomic Evidence](#).” in E. Dean, M. Harper and C. Hulten (eds.), *New Directions in Productivity Analysis*, University of Chicago Press, 303-363.

Gabaix, 2009, [Power Laws in Economics and Finance](#), *Annual Review of Economics*, 1, p. 255-93.

Sutton, 1997, “[Gibrat's Legacy](#),” *Journal of Economic Literature*, 35(1):40-59.

Simon and Bonini, 1958, “[The Size Distribution of Business Firms](#),” *American Economic Review*, 98(4): 607–617.

**I.2. The Selection Effect as a Basic Modeling Tool**

Lucas, 1978, “[On the Size Distribution of Business Firms](#),” *Bell Journal of Economics*, RAND, 9(2): 508-523

Hopenhayn, 1992, “[Exit, Selection and the Value of Firms](#),” *Journal of Economic Dynamics and Control*, 16: 621-653.

Hopenhayn, 1992, “[Entry, Exit, and Firm Dynamics in Long Run Equilibrium](#),” *Econometrica*, 60(2): 1127-1150.

Hopenhayn and Rogerson, 1993, “[Job Turnover and Policy Evaluation: A General Equilibrium Analysis](#),” *Journal of Political Economy*, 101(5): 915-38.

Melitz, 2003, “[The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity](#)”, *Econometrica*, Vol. 71, November 2003, pp. 1695-1725.

**Further readings:**

Luttmer, 2007, “[Selection, Growth, and the Size Distribution of Firms](#),” *Quarterly Journal of Economics*, 122(3): 1103-1144.

Luttmer, 2010, “[Models of Growth and Firm Heterogeneity](#)” *Annual Reviews of Economics*, 2010, Vol. 2, 547-576.

Jovanovic, 1982, “[Selection and the Evolution of Industry](#),” *Econometrica*, 50(3): 649-670.

### I.3. Incorporating Financial Market Imperfections

Cabral and Mata, 2003, “[On the Evolution of the Firm Size Distribution: Facts and Theory](#),” *American Economic Review*, 93(4):1075-1090.

Arellano, Bai and Zhang, 2009, [Firm Dynamics and Financial Development](#), mimeo., University of Minnesota.

Cooley and Quadrini, 2001, “[Financial Markets and Firm Dynamics](#)”, *American Economic Review*, 91(5):1286-1310.

#### Further readings:

Albuquerque and Hopenhayn, 2004, “[Optimal Lending Contracts and Firm Dynamics](#),” *Review of Economic Studies*, 71(2):285-315.

Clementi and Hopenhayn, 2006, “[A Theory of Financing Constraints and Firm Dynamics](#),” *Quarterly Journal of Economics*, 121(1), 229-265.

Evans and Jovanovic, 1989, “[An Estimated Model of Entrepreneurial Choice under Liquidity Constraints](#),” *Journal of Political Economy*, 97(4), 808-827.

### I.4. Human Capital and Innovation

Rossi-Hansberg and Wright, 2007, “[Firm Size Dynamics in the Aggregate Economy](#),” *American Economic Review*, 97(5), 1639-1666.

Chatterjee and Rossi-Hansberg, 2009, “[Spin-offs and the Market for Ideas](#),” mimeo.

#### Further readings:

Akcigit , 2010, “[Firm Size, Innovation Dynamics and Growth](#)”, *mimeo.*, U.Penn.

Jovanovic and Rob, 1987, “[Demand-Driven Innovation and Spatial Competition over Time](#),” *Review of Economic Studies*, 54(1):63-72.

Klette and Kortum, 2004, “[Innovating Firms and Aggregate Innovation](#)”, *Journal of Political Economy*, 112(5): 986-1018.

Luttmer, 2008, “[On the Mechanics of Firm Growth](#),” mimeo., University of Minnesota

Mortensen and Lens, 2005, “[Productivity, Growth and Worker Reallocation](#),” *International Economic Review* 46(3): 731-751.

## II. Firms and Aggregate Fluctuations

Floetotto and Jaimovich, 2008, “[Firm Dynamics, Markup Variations and the Business Cycle](#)”, *Journal of Monetary Economics*, 55(7): 1238-52.

Lee and Mukoyama, 2008, “[Entry, Exit and Plant-Level Dynamics over the Business Cycle](#)”, mimeo. Federal Reserve Bank of Cleveland

**Further readings:**

Bilbiie, Ghironi and Melitz, 2006, “[Endogenous Entry, Product Variety and Business Cycles](#)”, mimeo.

Campbell, 1998, “[Entry, Exit, Embodied Technology and Business Cycles](#)”, *Review of Economic Dynamics*, 1, 371-408.

Comin and Mulani, 2006, “[Diverging Trends in Aggregate and Firm Volatility](#)”, *Review of Economics and Statistics*, 88(2), pages 374-383

Cooley, Quadrini and Marimon, 2004, “[Aggregate Consequences of Limited Contract Enforceability](#)”, *Journal of Political Economy*, 111(4), 817-847.

Davis, Haltiwanger, Jarmin and Miranda, 2006, “[Volatility and Dispersion in Business Growth Rates: Publicly Traded versus Privately Held Firms](#)”, NBER W.P. # 12354

Eisfeldt and Rampini, 2006, “[Capital Reallocation and Liquidity](#),” *Journal of Monetary Economics*, 53, 369–399.

Franco and Philippon, 2007, “[Firms and Aggregate Dynamics](#)”, *Review of Economics and Statistics*

Gabaix, 2009, [The Granular Origins of Aggregate Fluctuations](#),” mimeo, NYU Stern

Rampini, 2004, “[Entrepreneurial Activity, Risk, and the Business Cycle](#).” *Journal of Monetary Economics*, 51:555-573.

**III. Firms, Misallocation and Aggregate TFP**

Klenow and Hsieh, 2009, “[Misallocation and Manufacturing TFP in China and India](#),” *Quarterly Journal of Economics*.

Restuccia and Rogerson, 2008, “[Policy Distortions and Aggregate Productivity with Heterogeneous Plants](#),” *Review of Economic Dynamics*, 11(4): 707-20.

**Further readings:**

Bartelsman, Haltiwanger and Scarpetta, 2007, “[Cross-country differences in Productivity: the role of Allocative Efficiency](#),” mimeo

Gourio and Miao, 2009, “[Firm Heterogeneity and the Long-Run Effects of Dividend Tax Reform](#),” forthcoming in *American Economic Journal: Macroeconomics*.

Guner, Ventura and Xu, 2008, “[Macroeconomic Implications of Size-Dependent Policies](#),” *Review of Economic Dynamics*.

Midrigan and Xu, 2009, “[Accounting for Plant-Level Misallocation](#),” mimeo. NYU.

Moll, 2010, “[Productivity Losses from Financial Frictions: Can Self-Financing undo Capital Misallocation](#),” mimeo, Princeton U.