

Syllabus and Reading list
Graduate Macro 3 - (Macro Finance)
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This course aims at introducing the main *heterogeneous agent models* used in the macroeconomic literature. The lectures will mainly focus on *modelling*, giving particular attention to mechanisms and economic intuitions. Classical and recent *theoretical articles* will be discussed (see reading list below). Basic of *maths*, optimization and probability theory (stochastic processes and markov chains) will be covered in TA sessions, as well as *problem sets* and *discussion about the articles*.

Syllabus (subject to changes)

Part 1 : Introduction and classical models

1°) Introduction: basic facts of aggregation in macroeconomics
Heterogeneity of agents: Household (Inequality) and Firms
Introduction to the main ideas of incomplete markets models (Pricing kernels, risk sharing etc.)

2°) Foundations: classical credit constraints and incomplete insurance markets models :

- Debt, Collateral constraint & Financial multiplier (Bernanke Gertler 1989)
- Holmström and Tirole QJE (1997)
- Advances in dynamic models: Kiyotaki and Moore JPE (1997)
- Credit constraint in DSGE: Bernanke Gertler Gilchrist (1999), Iacovello (2005)

3°) A primer on incomplete markets models

- Woodford AER (1990) - Public debt as Liquidity
- Mankiw JFE (1986) - Concentration and correlation of shocks
- Money supply in standard OLG model

4°) “Equity premium puzzle”

- Potential solutions: habit formation et disaster events

Part 2: Incomplete markets and Household heterogeneity

5°) « Classical » models of HA (Heterogenous agents):

- Bewley (1983) – Theory of money
- Huggett JEDC (1993) – Risk free rate
- General framework, Miao (Economic dynamics Textbook - Chapter 17)
- Definition of equilibrium in this type of models
- Incomplete market and uninsurable risks: Aiyagari QJE (1994)

6-7-8°) Reduced-heterogeneity representations

- No trade equilibria - Krusell Mukoyama Smith (2011), Ravn Sterk (2016 - HAM and SAM)
- Assumption on utility function – Ragot-Legrand (2016/2017)
- Truncation – Challe-Matheron-Ragot-Rubio Ramirez (2016)

9°) HA models with aggregate uncertainty

- Krusell-Smith (1998) – techniques & computation

10°) HANK (Heterogeneous agents New Keynesian models) and economic policy

- Bilbiie-Ragot (2017), Challe (2017), Ravn Sterk (2013/2016)

Part 3 - If time permits – Topics

11°) Topics in macroeconomics with heterogeneous agents

- Auclert 2016, Farhi Werning 2017, McKay Steinsson Nakamura 2015

12°) Optimal policy and distortion in incomplete market model

- Davila-Hong-Krusell-Rios Rull (2012 - Econometrica)

13°) Recursive contracts in macro models

- Marcet & Marimon (2011)

Grading:

- ***Tests – 25%***

During the TA sessions, 4 or 5 tests will be based on the readings (for sure: Woodford, Mankiw, Kiyotaki Moore, Bewley, Huggett, Aiyagari, Krusell Smith, and maybe other articles based on the content of the lecture) Exact list and dates will be given in September

- ***Homework – 10%***

1 Problem set given in week 1 (for week 3) based on the content of “Macro 2”: RBC models, NK-DSGE models

- ***Referee report – 25%***

(List of papers given in week 7/8 for a date in December) Based on a recent theoretical article (see below)

- ***Final exam – 40%***

2 parts: 1 open question based on the lectures, 1 or 2 problem sets based on the models seen in class and in TA sessions

Reading list:

Readings are compulsory. The models and results of these papers will be discussed in class and TA sessions. Tests based on the papers will be organized during TA sessions.

- Mehra, R. and Prescott, E.C. (1985), The Equity Premium: A Puzzle, *Journal of Monetary Economics*, 15(2), 145-161.
- Lucas, R.E. (1978), Asset Prices in an Exchange Economy, *Econometrica*, 46(6), 1429-1449.
- Weil, P. (1989), The Equity Premium Puzzle and the Risk-Free Rate Puzzle, *Journal of Monetary Economics*, 24(3), 401-421.
- Epstein, L.G. and Zin, S.E. (1989), Substitution, Risk Aversion, and the Temporal Behavior of Consumption and Asset Returns, *Econometrica*, 57(4), 937-969.
- Campbell, J. Y., & Cochrane, J. H. (1995). By force of habit: A consumption-based explanation of aggregate stock market behavior (No. w4995). NBER.
- Barro, R.J. (2009), Rare Disasters, Asset Prices, and Welfare Costs, *American Economic Review*, 99(1), 243-264.
- Bansal, R. and Yaron, A. (2004), Risks for the Long Run: A Potential Resolution of Asset Pricing Puzzles, *Journal of Finance*, 59(4), 1481-1509.
- Campbell, J.Y. (1999), Asset Prices, Consumption, and the Business Cycle, in *Handbook of Macroeconomics*, Volume 1C.
- Kocherlakota, N.R. (1996), The Equity Premium: It's Still a Puzzle, *Journal of Economic Literature*, 34(1), 42-71.
- Mankiw, N. Gregory, 1986. "The Equity Premium and the Concentration of Aggregate Shocks," *Journal of Financial Economics* 17, 211-219.
- Woodford, Michael, "Public Debt as Private Liquidity," *American Economic Review*, 1990, 80 (2), 382-388.
- Bernanke, B.S. and Gertler, M. (1989), 'Agency costs, net worth, and business fluctuations', *American Economic Review*, 79(1), 14-31.
- Bernanke, B.S., Gertler, M. and Gilchrist, S. (1999), 'The financial accelerator in a quantitative business cycle framework', *Handbook of Macroeconomics*
- Holmström, B. and Tirole, J. (1997), 'Financial intermediation, loanable funds, and the real sector', *Quarterly Journal of Economics*, 112(3), 663-691.
- Diamond, D. and Dybvig, P. (1983), 'Bank runs, deposit insurance, and liquidity', *Journal of Political Economy*, 91, 401-419.
- Kiyotaki, N., & Moore, J. (1997). Credit Cycles. *The Journal of Political Economy*, 105(2), 211-248.

- Aiyagari, S.R. (1994), Uninsured Idiosyncratic Risk and Aggregate Savings, *Quarterly Journal of Economics*, 109(3), 659-684. 10
- Bewley, T. (1983), A Difficulty with the Optimum Quantity of Money, *Econometrica*, 51(5), 1485-1504.
- Huggett, M. (1993), The Risk-Free Rate in Heterogenous Agent Incomplete-Insurance Economics, *Journal of Economic Dynamics and Control*, 17, 953-969.
- Krusell, P. and Smith, A.A. (1998), Income and Wealth Heterogeneity in the Macroeconomy, *Journal of Political Economy*, 106(5), 867-896.
- Aiyagari, S.R. and McGrattan, E.R. (1998), 'The optimum quantity of debt', *Journal of Monetary Economics*, vol. 42, pp. 447-469.
- Krusell, P., Mukoyama, T., & Şahin, A. (2010). Labour-market matching with precautionary savings and aggregate fluctuations. *The Review of Economic Studies*, 77(4), 1477-1507.
- Challe, E. and Ragot, X. (2016), Precautionary Saving Over the Business Cycle. *Econ J*, 126: 135–164.

Surveys (summarizing the large literature)

- Mehra, R., & Prescott, E. C. (2003). The equity premium in retrospect. *Handbook of the Economics of Finance*, 1, 889-938.
- Cochrane, J. H. (2006). *Financial Markets and the Real Economy*.
- Krusell, P. & Smith, A. A. (2006). *Quantitative macroeconomic models with heterogeneous agents*.
- Heathcote, J., Perri, F., & Violante, G. L. (2008). *Cross-Sectional Facts for Macroeconomists: United States (1967-2006)*. Unpublished manuscript.
- Heathcote, J., Storesletten, K., & Violante, G. L. (2009). Quantitative macroeconomics with heterogeneous households. *Annu. Rev. Econ.*, 1(1), 319-354.
- Guvenen, F. (2011). *Macroeconomics with heterogeneity: a practical guide*. *Economic Quarterly*, 97(3), 255-328.
- Brunnermeier, M. K., Eisenbach, T. M., & Sannikov, Y. (2012). *Macroeconomics with financial frictions: A survey* (No. w18102). National Bureau of Economic Research.
- De Nardi, M. (2015). *Quantitative Models of Wealth Inequality: A Survey*, No 21106, NBER Working Papers
- Ragot, X. (2017). *Heterogeneous agents in the Macroeconomy: Reduced-heterogeneity representations* (Preliminary – Handbook Chapter)

Referee report

Light and comprehensive referee report 3-4 pages.

Intro (1 page)

- What is the research question, the topic: large introduction, linked with the course as much as possible
- the literature : what other people tried to do, could not do, why this paper is bringing something

Model, (around 1 page, less if possible)

- what is the model about, is it a standard model? extended? brand new? why is it innovative?
- what is the setting? (briefly! mostly non-technical, you may state 2-3 equations to have an idea)
- what are the main assumptions? (the assumptions are key!). If it is a quantitative/econometric model, what is the methodology?

Critics, discussion (less than 0.5 page)

- What are the pitfalls? tractability/transparency, highly dependent on parameters/functional forms, weird/unusual maths.
- Did it forget something? (be careful: macro models always forget 99,9% of things) what are the thing they could have forgot which would change the result?

Results (1 page)

- What are the results? what are the main mechanisms identified by this model?
- Conclusion (few sentences): briefly what did we learn, what is the descriptive conclusion, what are the policy implication and recommendation