

Syllabus: ECON 180.605
Johns Hopkins University
Advanced Topics in Macroeconomics:
Quantitative Macroeconomics

1 Course Information

Contact Information

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Office Hours: Wednesdays, 10:00-12:00pm & By Appointment

Course Information

Schedule: Mondays, 1:00-3:00pm

Location: Mergenthaler 426

Course Website: <http://www.ericksager.com/advanced-macroeconomics.html>

Course Overview: This course focuses on quantitative methods in macroeconomics with heterogeneous agents and incomplete markets. This is a graduate course in the second year macroeconomics field and presumes a thorough knowledge of the core macroeconomics curriculum.

The main goals of this course are to expose students to questions and methods at the research frontier, discuss a variety of open questions in this area that can lead to research papers (or a dissertation), and equip students with the tools necessary to tackle these questions.

Course content is divided into three parts. In the first part of the course, we will review the workhorse heterogeneous agent models with incomplete markets, and discuss some of the numerical methods used to solve them. In the second part, we will cover a variety of topics that extend the workhorse model along interesting dimensions. We will conclude the course by using these tools to understand and evaluate recent research on the Great Recession.

2 Course Requirements

Satisfactory completion of the course requires consistent class participation, the completion of all problem sets, a written referee report, a written research proposal, presenting your research proposal and presenting a pre-approved working paper. These requirements are detailed below.

1. **Participation:** You are expected to prepare for each lecture by studying the required

readings as indicated in the syllabus. Actively discussing ideas and learning how to ask good questions is an important part of the research process. You should use this course as an opportunity to hone these skills.

2. **Problem Sets:** Problem sets are designed to develop your economic intuition and improve your computational skills. You are highly encouraged to work together on problem sets, but you must write and submit your work individually. For computational assignments, you must submit your source code (I will be checking both results and source code).
3. **Referee Report:** You will write a referee report on a recent working paper. In the course outline below, readings denoted with a “(R)” can be used for your referee report. The purpose of a referee report is to critically evaluate the features and bugs of a paper. Roughly speaking, the report should include following ingredients:
 - (a) *Summary:* Summarize the main question of the paper, the basic answer to that question and the types of methods used to answer the question. What are the main economic insights that the author(s) develop?
 - (b) *Evaluation:* What is the contribution? Relative to the relevant literature(s)?
 - (c) *Critique:* How can the paper be improved? What further work would you need to see to believe the author(s) results?
 - (d) *Recommendation:* Based on (a), (b) and (c), would you recommend that the paper be accepted as is, revised and resubmitted or rejected?

Many others have described how to write a useful referee report and I encourage you to search online for these writings. Two good benchmarks can be found on Anton Korinek’s course website ([click here](#)) and on Nicole Fortin’s course website ([click here](#)).

4. **Presentations:** You will give two presentations for this course. First, you will present a recent paper on the Great Recession. Paper choices are listed below, denoted with a “(P)” beside them. Papers will be assigned on a first-come, first-served basis. Email me your first and second choices by **September 14th**. Your second presentation will be your research proposal, which is discussed immediately below.
5. **Research Proposal:** At this stage of your training, you should be considering research topics and developing a feasible research question. You will write a research proposal and present your proposal during class. The written proposal should be no longer than 10 pages, unless you have made considerable progress during the semester and wish to obtain additional feedback. The in-class presentation should approximately last an hour. I strongly recommend that you start working on this early in the semester. Please feel free to visit me during office hours if you would like to discuss your ideas.

The research proposal should outline a clear research question, relate your proposed research to existing literature and clearly explain your marginal contribution to the prior work on the subject. Then you should describe how you intend to answer this question by:

- constructing a preliminary model or outlining a potential model
- providing propositions/results of a simplified (toy) model,

- detailing an algorithm for computing equilibria of a quantitative model,
- describing which data set you would use and how to derive results from it, etc.

Preliminary data or computational results are ideal, but I do not expect that you solve a complete version of your model or empirical work. Focus on solving a simplified version of your model/data in order to develop insight into your specific economic question. A successful proposal should be detailed, clearly written and provide me with an interesting insight.

Start your in-class presentation with a presentation of your motivation, question and preliminary work. Treat your in-class presentation as a workshop environment, meaning an opportunity to solicit feedback from me and the rest of the class. Obtaining others' thoughts and ideas can only improve your own research, so put some thought into what aspects of your research you are still hoping to improve and don't be afraid to ask the class for pointed feedback and discussion.

Deadlines:

- *Problem Sets*: Announced when a problem set is assigned.
- *Referee Report*: Written report due by the last day of classes, December 4th. Paper selection due by September 14th.
- *Written Research Proposal*: By the last day of classes, December 4th.
- *Paper Presentation*: Paper selection due by September 14th. Presentations start once course topics conclude, expect early to mid-November. Dates may vary with course enrollment.
- *Research Proposal Presentation*: Presentations start once Paper Presentations conclude.

3 Useful Resources

Lecture notes: There are two sources for lecture notes.

- I will supply lecture notes on the course website.
- Christopher Carroll's lecture notes are embedded in his syllabus for Econ 180.605 ([click here](#)). I will heavily use these during the first part of the course.

Texts and Articles: There is *no required textbook* for this course. However, I strongly recommend the following books and articles.

Books:

- *Macroeconomics Textbooks*: [Ljungqvist and Sargent \(2012\)](#); [Stokey, Lucas and Prescott \(1989\)](#)

- *Computation and Numerical Methods*: [Judd \(1998\)](#); [Heer and Maussner \(2009\)](#); [Marimon and Scott \(1999\)](#); [Cooley and Prescott \(1995\)](#)

Articles:

- *Economic Methodology*: [Friedman \(1953\)](#); Narayana Kocherlakota on the State of Macroeconomics (on course website)
- *Heterogeneity in Macroeconomics*: [Heathcote, Storesletten and Violante \(2009\)](#), [Guvonen \(2011\)](#)
- *Quantitative Work*: Tony Smith's advice (on course website)

Software: Pieces of coursework will require that you write code and perform numerical experiments.

- You are free to use the software of your choosing (e.g. Matlab, Fortran, C, Python, Julia). If you are new to computation, then consider reading [Aruoba and Fernández-Villaverde \(2014\)](#) to help inform your choice.
- Some coursework may ask you to utilize [Carroll and Palmer's \(2015\)](#) Heterogeneous-Agent Computational toolKit (HACK) which is written in Python. For those who are new to Python, Thomas Sargent and John Stachurski have created an economics oriented primer, which can be found at <http://quant-econ.net>. Expect an email containing information on how to obtain and install HACK.

4 Course Outline

In the following course outline, readings are classified by a series of symbols. Readings denoted with a bullet “•” will be covered in class, while readings denoted with an asterisk “*” are optional and should be considered background material. Readings denoted with a “(R)” can be used for your referee report. Readings denoted with a “(P)” can be used for your presentation. Citations are contained in the [References section](#) at the end of this syllabus.

1. Distributional Effects and Aggregation

- Gorman Aggregation: Homotheticity / Quasi-linearity
 - [Gorman \(1953\)](#)
 - * Chapter 4 in [Mas-Colell, Whinston and Green \(1995\)](#)
- Complete Markets and Concave Utility
 - [Maliar and Maliar \(2003\)](#)
 - * [Constantinides \(1982\)](#), [Maliar and Maliar \(2001\)](#)
- *Application*: Misallocation and Aggregate Productivity

- Hsieh and Klenow (2009); Hsieh and Klenow (2014)
- * Restuccia and Rogerson (2008); Chari, Kehoe and McGrattan (2007)

2. Insurance and Consumption Smoothing

- Permanent Income Hypothesis (The Certainty Equivalence Case)
 - Christopher Carroll's Lecture Notes ([click here for "TimeSeriesCEQ.pdf"](#))
 - * Hall (1978); Campbell and Deaton (1989)
 - * Other citations within the Lecture Notes
- Examples: Permanent and Transitory Shocks
 - * Bewley (1977); Schechtman and Escudero (1977); Chamberlain and Wilson (2000)
 - * Chapter Chapter 16 in Ljungqvist and Sargent (2012)
- Precautionary Savings and Prudence
 - Kimball (1990); Carroll (2009)
 - * Leland (1968); Sibley (1975)
 - * Carroll and Kimball (1996)
- Friedman / Buffer Stock (FBS) Model
 - Christopher Carroll's Lecture Notes ([click here for "TimeSeriesBufferStock.pdf"](#))
 - * Deaton (1991); Carroll (1992); Carroll (2012)
 - * Other citations within the Lecture Notes
- Wealth Distributions in the FBS Model
 - Carroll, Slacalek, Tokuoka and White (2014)
- * Computation
 - * Christopher Carroll's Lecture Notes ([click here for "SolvingMacroDSOPs.pdf"](#))
 - * Christopher Carroll's Lecture Notes ([click here for "SolvingMicroDSOPs.pdf"](#))

3. Standard Incomplete Markets Model

- Neoclassical Growth Model with Incomplete Markets
 - Aiyagari (1994); Huggett (1993)
- Recursive Competitive Equilibrium: Existence and Uniqueness
 - Huggett (1993); Aiyagari (1993) (working paper version)
 - * Hopenhayn and Prescott (1992)
 - * Chapters 11-13 in Stokey, Lucas and Prescott (1989)
- Computing the Individual's Dynamic Program
 - *EGM*: Carroll (2006); Barillas and Fernández-Villaverde (2007)
 - *ECM*: Maliar and Maliar (2013)
 - *Markov Chains*: Tauchen (1986); Kopecky and Suen (2010)
- Computing the Stationary Distribution

- Ríos-Rull (1997), which is also Chapter 11 of Marimon and Scott (1999)
 - Chapter 5 in Heer and Maussner (2009)
 - Calibration
 - Browning, Hansen and Heckman (1999)
 - * Guvenen and Smith (2014)
 - Constrained Inefficiency
 - Dávila, Hong, Krusell and Ríos-Rull (2012)
 - * Mendoza (2010); Jeanne and Korinek (2010); Bianchi (2011)
 - *Application*: Wealth Inequality and Occupational Choice
 - Quadrini (2000); Cagetti and De Nardi (2006)
 - * De Nardi (2015); Benhabib, Bisin and Zhu (2011)
 - (R) Guvenen, Kuruscu, Tanaka and Wiczner (2015b)
4. **Incomplete Markets Model with Aggregate Uncertainty**
- Neoclassical Growth Model with Incomplete Markets and Aggregate Uncertainty
 - Krusell and Smith (1998)
 - * Miao (2006)
 - Computation: “Bounded Rationality” and Quasi-Aggregation
 - Young (2010); Maliar, Maliar and Valli (2010)
 - * Den Haan (2010); Den Haan and Rendahl (2010); Reiter (2010)
5. **Incomplete Markets and the Life-Cycle**
- Neoclassical Growth Model with Incomplete Markets and Overlapping Generations
 - Huggett (1996); Storesletten, Telmer and Yaron (2004a)
 - * Storesletten, Telmer and Yaron (2004b); Guvenen, Karahan, Ozkan and Song (2015a)
 - Computation: Shooting Algorithm
 - Ríos-Rull (1997), which is also Chapter 11 of Marimon and Scott (1999)
 - Chapter 7 in Heer and Maussner (2009)
 - Overlapping Generations with Aggregate Uncertainty
 - Krueger and Kubler (2004)
6. **Topics: Consumer Finance and Insurance**
- Secured Debt and Collateral Constraints
 - Fernández-Villaverde and Krueger (2011)
 - (R) Sommer and Sullivan (2014)
 - Endogenous Borrowing Constraints
 - Zhang (1997)

- * Kehoe and Levine (1993); Kocherlakota (1996); Alvarez and Jermann (2000)
- Debt and Default
 - Chatterjee, Corbae, Nakajima and Ríos-Rull (2007)
 - Livshits, MacGee and Tertilt (2007)
 - * Athreya, Tam and Young (2012)
 - (R) Mitman (2015)
 - (R) Corbae and Glover (2015)
- * *Computation with Non-Concavity*:
 - * *EGM*: Fella (2014)
 - * *ECM*: Arellano, Maliar, Maliar and Tsyrennikov (2014)
- Insurance and Inequality
 - Blundell, Pistaferri and Preston (2008); Kaplan and Violante (2010)
 - * Krueger and Perri (2006)

7. Topics: Public Finance (time permitting)

- Steady State Debt, Taxation and Transfers
 - Aiyagari and McGrattan (1998); Flodén and Lindé (2001)
 - * Flodén (2001)
 - (R) Heathcote and Tsujiyama (2015)
- Dynamic Fiscal Policy
 - Heathcote (2005)
 - * Domeij and Heathcote (2004)
- Life-Cycle Taxation
 - Conesa, Kitao and Krueger (2009);
 - * Auerbach and Kotlikoff (1987); Erosa and Gervais (2002)
 - (R) Peterman and Sommer (2014)

8. Topics: Firm Size Dynamics (time permitting)

- Industry Equilibrium
 - Hopenhayn (1992); Atkeson and Kehoe (2005)
 - * Luttmer (2007); Lee and Mukoyama (2015); Clementi and Palazzo (2015)
 - (R) Carvalho and Grassi (2015)
- Credit Market Frictions
 - Midrigan and Xu (2010) (working paper version)
 - * Khan and Thomas (2013); Cooley and Quadrini (2001)
 - (R) Shourideh and Zetlin-Jones (2014)

9. Topics: The Great Recession

- Demand and Wealth Effects
 - Mian, Rao and Sufi (2013)
 - * Mian and Sufi (2015)
- Student Presentations (actual presentations will be selected in random order)
 - (P) Arellano, Bai and Kehoe (2012)
 - (P) Bassetto, Cagetti and De Nardi (2015)
 - (P) Carroll, Slacalek and Sommer (2013)
 - (P) Guerrieri and Lorenzoni (2015)
 - (P) Kaplan and Violante (2014)
 - (P) Gorea and Midrigan (2015)
 - (P) Heathcote and Perri (2015)
 - (P) Kehoe, Midrigan and Pastorino (2014)
 - (P) Korinek and Simsek (2014)
 - (P) Philippon and Midrigan (2011)

10. Research Proposal Presentations

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