Heterogenous Agent Models (HAM)
Crafting, Calibration, and Estimation

Fall 2020, Econ 8181
Professor Mariacristina De Nardi

Course contents

HAM is a second-year graduate class on quantitative heterogeneous agents models. Its goal is to bring class participants to the frontier of research in this field and help generate ideas for research projects. The course will start with a basic life cycle model of consumption and savings and will then turn to models in which agents face a richer set of risks and make more decisions. These applications focus on savings and consumption, investment in health and human capital, and on couples and singles. Other topics that will be covered include wealth inequality, entrepreneurship, and more generally how risks and saving motives lead to wealth inequality. Along the way, we will discuss how to take these model to data and calibration versus estimation methods, including the method of simulated moments. We also will critically evaluate the successes of these models, their shortcomings, and their policy implications. Below the course organization section, you can find a reading list containing many papers on each topic, several of which we will cover in class.

Course organization and grading

Times: From September 9 to December 16, 2020, on Wednesdays 9-11am and Fridays 2-4pm (Central time).

Email: denardim@nber.org

Office hours: By appointment

Grading. For each mini, to have a grade for this class, you have to either do
a class presentation or a referee report (one of each if you take both minis) and to participate in class in order to receive a class grade. Within each mini, your class grade will be determined for 80% by your presentation (or referee report) and for 20% by your class participation. Given that our class will be on Zoom, class participation includes keeping your video up, paying attention, asking questions, and making comments.

Both the paper to be presented and the paper to be refereed have to be approved by me. For presentation purposes, both published and unpublished papers that I am not presenting in class can be good choices. For the purposes of writing a referee report, it is best to choose an unpublished paper. In terms of choosing the paper to referee, there are many listed in my syllabus and that I am not presenting in class. One possibility is that you pick 2-5 papers among those to propose me and that we agree on one of them. Another possibility is that you find some other papers that you are interested in reading and that are related to the class' topics and that you propose me some of those.

Presentations. At the beginning of the mini when you are presenting, we will agree on your presentation date. You have to send me your slides at least 48 hours before your presentation. Your slides have to be clear and complete. Use talking points rather than full sentences and keep your slides clean. Question, model, data, facts, and methodology have to be discussed. You also have to discuss why you picked this paper, what are its strengths and weaknesses, and how it could be either improved or expanded. I will use these criteria in mind when grading your presentation.

Referee reports. Your report is due by the last day of the relevant mini. In terms of referee report content, please do follow the instructions in “The referee’s ABC” guide that I posted my teaching web page. I will use the guidelines in this document to grade your referee report.

**Reading List**

**Consumption, Savings, Labor Supply, and Retirement**


Savings, Health, and Medical Expenses


Ameriks, Briggs, Caplin, Shapiro, and Tonetti “Long-Term Care Utility and Late in Life Saving” 2016.


Barth, Papageorge, and Thom 2019, “Genetic Endowments and Wealth Inequality”, NBER wp w24642.


French and Britton “Health and employment amongst older workers”, 2020, Mimeo


Ozkan “Preventive vs. curative medicine: A macroeconomic analysis of health care over the life cycle”, 2017, Manuscript, University of Toronto.


Postel-Vinay and Jolivet “A structural Analysis of Health and Labor Market Trajectories”, 2020, Mimeo
Savings and Wealth Inequality


**Earnings and Consumption Risk**


Education and Human Capital
Caucutt and Lochner “Early and Late Human Capital Investments, Borrowing Constraints, and the Family,” 2012, NBER wp. n. 18493.
Daruih “The Macroeconomic Consequences of Early Childhood Development Policies”, 2019
Hai and Heckman “Inequality in Human Capital and Endogenous Credit Constraints,” 2016.
Hughett, Ventura and Yaron “Sources of Lifetime Inequality,” 2013 American Economic Review.
Heckman and Mosso “The Economics of Human Development and Social Mobility,” 2014 NBER wp 19925.

**Female Labor Supply**


Couples and Singles


Gemici and Laufer “Marriage and Cohabitation,” 2013, Mimeo.


Voena “Yours, mine, and ours: Do divorce laws affect the intertemporal behavior of married couples?”, 2015, American Economic Review, 105(8), 2295-2332.

Bequests and Inter-Vivos Transfers
Barczyk and Kredler “Evaluating Long-Term-Care Policy Options, Taking the Family Seriously”

Lockwood “Incidental Bequests: Bequest Motives and the Choice to Self-Insure Late-Life Risks,” 2015, mimeo.
Recommended policy statements by the University of Minnesota

Student Conduct Code
The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.
As a student at the University you are expected to adhere to Board of Regents Policy: Student Conduct Code.
Note that the conduct code specifically addresses disruptive classroom conduct, which means “engaging in behavior that substantially or repeatedly interrupts either the instructor’s ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities.”

Use of Personal Electronic Devices in the Classroom
Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be used in the classroom.

Scholastic Dishonesty
You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. If it is determined that a student has cheated, the student may be given an "F" or
an “N” for the course, and may face additional sanctions from the University. The Office for Community Standards has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty. If you have additional questions, please ask me.

Sexual Harassment
“Sexual harassment” means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual’s work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy.

Equity, Diversity, Equal Opportunity, and Affirmative Action
The University provides equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy.

Disability Accommodations
The University of Minnesota views disability as an important aspect of diversity, and is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you have, a disability in any area such as, mental health, attention, learning, chronic health, sensory, or physical, please contact the DRC office on your campus (UM Twin Cities - 612.626.1333) to arrange a confidential discussion regarding equitable access and reasonable accommodations. Students with short-term disabilities, such as a broken arm, can often work with instructors to minimize classroom barriers. In situations where additional assistance is needed, students should contact the DRC as noted above. If you are registered with the DRC and have a disability accommodation letter dated for this semester or this year, please contact your instructor early in the semester to review how the accommodations will be applied in the course. If you are registered with the DRC and have questions
or concerns about your accommodations please contact your access consultant/disability specialist. Additional information is available on the DRC website.

Mental Health and Stress Management
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website.

Academic Freedom and Responsibility
Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom and conduct relevant research. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled. Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost.