Economics 521  Advanced Macroeconomics I

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Overview: This is a graduate course in the second year macroeconomics field. We will first cover some tools, namely continuous time methods that are useful for macroeconomics. These include Hamiltonians, Stochastic Calculus, Hamilton-Jacobi-Bellman equations, and Kolmogorov Forward Equations. Rather than presenting an in-depth technical derivation of the methods from first principles, my aim is to provide you with a “cookbook” for you to use these methods in your own research and then to cover a few applications. We will then cover some stochastic models that generate growth in individual firm productivity, firm size, individual income and wealth, CEO pay and many other variables of economic interest. These are models that have implications for cross-sectional data and for time series behavior of an economy as a whole. Some of these will rely on the continuous time methods we developed in the first part of the course.

Organization: The class meets on Tuesdays and Thursdays from 1:00 to 2:30pm. A preliminary syllabus is attached. I will add papers throughout the course.

Grading: Your course grade will be based on one or two problem sets and a written project due on January 25. Your choice of paper should be consistent with your interests. The written project should be on an original research idea, necessarily related to the course’s topics (including Guido’s part). Descriptions or reviews of the literature are acceptable but not as ambitious. In any case, your idea should be expressed in the context of the relevant literature. Only one idea per project, please!

1. Deterministic Continuous Time Methods

1.A Methods:

Lecture Notes: Hamiltonians and Phase Diagrams

Acemoglu (2010), Chapter 7 “Review of the Theory of Optimal Control” in “Introduction to Modern Economic Growth”

1.B Applications:

Lecture Notes: Neoclassical Growth Model in Continuous Time

Acemoglu (2010), Chapter 8 “The Neoclassical Growth Model” in “Introduction to Modern Economic Growth”

Lecture Notes: “An Exact New Keynesian Model in Continuous Time”


Additional readings on liquidity traps and fiscal multipliers in New Keynesian models:


2. Stochastic Continuous Time Methods

2.A Methods:

Lecture Notes: Stochastic Calculus, Hamilton-Jacobi-Bellman Equations, Kolmogorov Forward Equations, Finite Difference Methods


2.B Applications:


Stokey (2008), Chapter 6 “Exercising an Option” from “The Economics of Inaction: Stochastic Control Models with Fixed Costs”

Additional readings on the implications of financial frictions for business cycle fluctuations:


3. Stochastic Models of Distribution and Growth in Macroeconomics

3.A Prerequisites (Not Taught)


3.B Income and Wealth Distribution


Benhabib, Bisin and Zhu (2011), ”The distribution of wealth and fiscal policy in economies with finitely lived agents” Econometrica


Additional readings on income and wealth distribution:


Huggett, Ventura and Yaron (2011), “Sources of Lifetime Inequality,” American Economic Review


Krueger, Perri, Pistaferri and Violante (2010), “Cross-Sectional Facts for Macroeconomists”, Review of Economic Dynamics. This is a special issue, also see other papers: http://www.economicdynamics.org/RED-cross-sectional-facts.htm


Quadrini (1999): “The Importance of Entrepreneurship for Wealth Concentration and Mobility,” Review of Income and Wealth


3.C Firm Size and Productivity Distribution


Additional readings on firm heterogeneity


Khan and Thomas (2008), “Idiosyncratic shocks and the role of nonconvexities in plant and aggregate investment dynamics” Econometrica


3.D Other


