1 Overview of the Course

Business cycle theory is concerned with explaining the recurrent fluctuations in aggregate business activity that characterize modern industrialized economies. Yet, despite the substantial progress that has been made in understanding their nature, much remains unresolved. Important questions regarding the business cycle are still being actively debated. For example:

- 1. What are the key causes of macroeconomic fluctuations?
- 2. Is there is a link between short and long term performance?
- 3. What is the impact of macroeconomic fluctuations on the industrial structure of the economy?
- 4. What is the welfare cost of macroeconomic fluctuations?
- 5. What is the role of government policy in containing (or amplifying) macroeconomic fluctuations?

Modern business cycle theory is dominated by the 'microeconomic' approach advocated by Lucas (1980) and pioneered by Kydland and Prescott (1982) together with Long and Plosser (1983). The substantive difference between the modern approach and the traditional approach is in terms of how economic behavior is modeled. Rather than hypothesizing directly on the structure of behavioral rules, the modern approach prefers to derive optimal behavioral rules from a more primitive set of objects that describe individual preferences, technology, endowments, information and institutional structure.

The derived behavioral rules are optimal in the sense that they are consistent with individuals doing the best they can (according to their preferences), subject to the constraints on their behavior. The preferred solution concept invokes consistency in the formation of expectations (rational expectations).

Ok, so what does this imply? It implies that this is a very exciting topic to study. But it also implies that we are going to work a lot...(more on this later)

2 What do I hope we achieve in this class?

In General

- My hope is that by the end of this semester, the participants will feel comfortable doing what professional economists are nowadays asked to do: Namely to provide concrete, quantitative answers to important economic questions.
- Let me emphasize one thing: quantitative doesn't imply that answers like "this is what the computer says" are going to be acceptable. We are economists, and we want to understand. So we'll always try to cover the intuition for each result we'll discuss.

More Specifically

- 1. Establish the empirical characteristics of the business cycle (the stylized facts).
- 2. Study the frontier of the business cycle research. Specifically, this implies that we are going to think along three different (related) avenues:
 - (a) Explain the business cycle:
 - Think about it for a moment Why is the economy sometimes expanding, and sometimes contracting? Looks weird, no?
 - So here we are going to try and learn what we know about the origins of the cycle.
 - Virtually all modern theories of the business cycle choose to interpret fluctuations in economic activity as emanating from some hypothesized source called the *impulse mechanism*. These impulses or 'shocks' are somehow magnified thorough the economic system, both in space and over time; the law governing this process is called the *propagation mechanism*.
 - So we are going to go deep into the unknown what are these shocks? How are these shocks affecting the economy?
 - (b) Study the impact of the macroeconomic fluctuations:
 - Here the idea is somewhat different....
 - We'll say something like "let's take it as a given that there are some sort of shocks" (we are going to be very precise about this, don't worry) and then study if the presence of a cycle can help us understand different phenomena in the data and/or in theory.
 - (c) Optimal Policy:
 - Notice that good fiscal and monetary policy requires a clear understanding of the workings of the economy.
 - Especially, what drives the business cycle.
 - That is, a proper evaluation of the benefits and costs of a given policy proposal requires knowledge of the determinants of the business cycles.
 - This is one reason for the considerable body of research aimed at understanding these phenomena.
 - Once we feel that we have come up with a reasonable model, we'll study questions like "can the government stabilize the economy?", "should it?" etc.
- 3. Help the students navigate through the mysteries of writing down a formal model and linking it to the data.
- 4. Learn the required technical (both mathematical and quantitative) skills that are routinely employed by the leading practitioners in the field.

- These skills include the ability to set up, solve and evaluate dynamic general equilibrium models using a (i) paper and pencil (ii) computer.
- Instead of teaching you a bunch of math and you looking at me with your eyes wide open, the idea (hopefully) will be the following one: I'll start with an economic problem, and if in order to address it we'll have to learn some math, so be it. At least this way, we'll understand why we are learning it.

3 Administrative Information

Course Materials:

- There is no required textbook. Readings will (mainly) come from a variety of sources. However, the following books are recommended to anyone who is interested in business cycle research in particular, and Macroeconomics research in general:
 - 1. Adda, J and Cooper R. Dynamic Programming: Theory and Macroeconomic Applications, MIT Press, October 2003.
 - Cooley, Thomas F., Editor. Frontiers of Business Cycle Research. Princeton University Press: 1995.
 - Cooper, R. Macroeconomic Complementarities, Cambridge University Press, 1999.
 - 4. Farmer Roger, The Macroeconomics of Self-Fulfilling Prophecies, MIT Press.
 - Ljungqvist, Lars and Thomas J. Sargent. Recursive Macroeconomic Theory. Cambridge, Mass.: MIT Press, 2000.
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Grading

- Ok, you are going to work a lot. But I truly believe that this work will prove to be useful for your career as Economists in general and as Macro-economists in particular. So here is what you should expect:
 - 1. No exam I want you to get to do research as quickly as possible.

- 2. *Problem sets* Yes. A lot. Tom Sargent said once "You develop intuition by working a problem 1000 times". You won't work through 1000 questions, but the problem sets are going to be a critical part of the class.
- 3. Class presentations At the end of the day, after spending 5 years in a dark office, you'll have to go out and present your work. That's a different skill that sometimes students don't realize that they should work on developing. The idea here will be that you will be presenting work from the literature that I will assign.
- 4. *Research Proposal:* Again, the idea will be to get you to do research. A research proposal could be you coming to my office and telling me something like:
 - (a) I took the work of "bla bla bla" and checked how changing this assumption/parameter etc. affected the results.
 - (b) I decided that all you were teaching us is not worth much. Here is my theory on.....
- "So how are we graded?" Honestly, who cares? That's it. You have passed the qualifying exams. Now it's time for research. We'll figure out some way to give weights to all the above elements.
- However....I don't want this class to become a "class of last resort" for students who just want to get some credit...So this is what we are going to do. If I see that there is an effort made by the class (i.e., working on the problem sets, dedicating time to go over the material, reading the papers I assign, giving clear presentations etc.) then we'll find a way to grade the class without an exam. However, if we'll see that this is not the case, then we'll have to have a take home exam.

Technical Details

- Instructor: Nir Jaimovich.
- Office: Economics Building 227
- Office Hours: To be announced.
- Email: njaimovich@ucsd.edu
- Classroom: Here (Econ 300).
- Class time: TuTh 9:30 10:50 a.m.
- Class Webpage:

http://www.econ.ucsd.edu/~njaimovi/teaching/graduate/graduate/usinesscycle.html

4 Topics to be Covered

1. Introduction

- (a) What is the Business Cycle? Stylized facts.
- (b) The plan of the course.

2. The Benchmark Real-Business-Cycle (RBC) model

- (a) A two period example.
- (b) It's all about the labor market....I
- (c) The Model.
- (d) Log Linearization.
- (e) Calibration What is it?
- (f) First-Order Difference Equation.
- (g) Simulating the Model.
- (h) The Economic Mechanism behind the RBC.
 - i. Intertemporal Substitution of Labor
 - ii. Intertemporal Substitution of Consumption
- (i) Measuring Technology Shocks Problem set I.
- (j) The (UN) Importance of capital stock
- (k) The importance of capital services: Capacity Utilization.
- (l) Shortcoming of the model.
 - i. Productivity and hours.
 - A. Volatility of Hours.
 - B. Correlation between productivity and hours.
 - C. Estimation GMM.
 - ii. Propagation.
- (m) Labor Productivity
 - i. What does the data say?
 - ii. Implications for Demand Shocks
 - iii. Implications for Supply Shocks
 - iv. Labor Hoarding / Externalities / Markups
- (n) Class Presentation:
 - Cogley, T., and J. Nason (1995): "Output Dynamics in Real Business Cycles Models," American Economic Review, 85(3), 492-511
 - Burnside, C., M. Eichenbaum, and S. Rebelo (1993): "Labor Hoarding and the Business Cycle," Journal of Political Economy, 101(2), 245-273.

3. Models of Increasing Returns and Externalities.

- (a) What does the data say? On the degree of Externalities.
- (b) Magnification of Technology Shocks
- (c) Continuos time optimization.
- (d) Dynamic Stability

4. Model of Imperfect Competition.

- (a) What does the data say? Monopoly Power and Cyclical properties
- (b) It's all about the labor market....II
- (c) The Canonical Model.
- (d) Models of Endogenous Markups.
- (e) Implications for technology shocks and magnifications.

5. Comovement

- (a) What does the data say?
- (b) The Two-Sector Model.
- (c) It's all about the labor market....*III*
- (d) Class Presnetation: Boldrin, M., Christiano, L. and Fisher, J. "Habit Persistence, Asset Returns, and The Business Cycle", Federal Reserve Bank of Minneapolis, November 2000, Research Department Staff Report 280

6. Fluctuations in the Price of Investment Goods.

- (a) What does the data say?
- (b) Possible economic mechanisms behind the fluctuations.

7. Money and The Business Cycle

- (a) Money Stylized Facts
- (b) Monetary Models:
 - i. Cash in Advance.
 - ii. Limited Participation.
 - iii. Sticky Prices.
- (c) Strategic-Complementarities due to pricing decisions.

8. The Empirical Debate: Is the Technology-Driven Real Business Cycle Hypothesis Dead?

(a) Blanchard-Quah.

- (b) VAR.
- (c) Gali.
- (d) Ramey.
- (e) Fisher.
- (f) Some Thoughts about the Identification of "Technology Shocks".
- (g) Class Presentation: A presentation combining the following articles:
 - i. Christiano, Lawrence, Martin Eichenbaum, and Robert Vigfusson (2003): "What happens after a Technology Shock?," mimeo.
 - ii. Fernald, John (2004): "Trend Breaks, Long Run Restrictions, and the Contractionary effects of a Technology Shock," mimeo, Federal Reserve Bank of Chicago.
 - iii. Francis, Neville and Valerie A. Ramey (2002), "Is the Technology-Driven Real Business Cycle Hypothesis Dead?" NBER Working Paper #8726.
 - iv. Pesavento, E. and Rossi, B. "Do Technology Shocks Drive Hours Up or Down? A Little Evidence From an Agnostic Procedure", Working Paper 2004.
 - v. Shea, J. "What do Technology Schoks Do?", NBER working paper 6632.

9. Financial Markets and The Business Cycle

- (a) Data.
- (b) A Toy Example of Bernanke-Gertler.
- (c) Class Presentation: Bernanke, Ben, Mark Gertler and Simon Gilchrist (1998) The Financial Accelerator in a Quantitative Business Cycle Framework, in John B. Taylor and Michael Woodford, eds., Handbook of Macroeconomics, Volume 1C. Amsterdam: Elsevier Science Publishers. (NBER Working Paper 6455)).
- (d) Is it all about Liquidity and Net Worth (More Questions than Answers).

10. The Great Depression

(a) A History of Wedges.

11. Business Cycles in Developing Countries

- (a) Data.
- (b) Class Presentation: Perri, F. and Neuymeyer, A. 'Business Cycles in Emerging Economies: The Role of Interest Rates', forthcoming in JME.

12. Costs of the Business Cycle

- (a) Should we really care?
 - i. Lucas No.
 - ii. Modification # I: Incomplete Markets: Still no.
 - iii. Modification # II: It's not about the level...It's the Trend!

13. Business Cycles and Long-Run Growth

- (a) Is it the trend?!
- (b) Three questions:
 - i. Sign Effects Is a recession Predicting higher growth?
 - ii. Level Effects Is a higher volatility good or bad for growth?
 - iii. Amplitude Effects A small recession vs. a big recession.

14. Structual Break in the Business Cycle?

- (a) Data 1984.
- (b) An overview of the Inventory approach.
- (c) Class Presentation: Jeffrey R. Campbell and Zvi Hercowitz, "The Role of Households' Collateralized Debts in Macroeconomic Stabilization", Working Paper, Federal Reserve Bank of Chicago.

15. Strategic Complementarities and the Business Cycle

(a) A more rigorous "Animal Spirits"

16. Government Policy and The Business Cycle

- (a) On the Effects of government policy.
- (b) Is this really what's happening?
- (c) Optimal government policy

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