

MA/PhD

Introduction to Graduate Macroeconomics

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Objectives

This course is intended as a precursor to the first full PhD course in macroeconomics. It is intended as a bridge over the unusually large gulf that lies between undergraduate and modern graduate macroeconomics.

The first PhD course begins with dynamic rational expectations models. This course offers some history of thought that makes clear why all serious modern macroeconomics is dynamic. We begin with a review of the state of the art of macroeconomics theory c. 1965. We will review its limitations, which provides the groundwork for what became known as the rational expectations revolution. Two-thirds of the course will cover the the early, fundamental breakthroughs in rational expectations modeling -- both the New Classical models of the 1970s and some of the New Keynesian responses of the 1980s. After completing this course, you will have the technical knowledge and historical context necessary to succeed in the first PhD course.

Meeting Times and Locations

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Grading

There are six home work assignments, a mid-term, and a final exam. You may either work alone on these homeworks, or in pairs. If two people work jointly on an assignment, they must hand in just one copy of the assignment with both names on it. Please note: No more than two people may work jointly on an assignment: working in pairs facilitates learning; working in groups of three or more facilitates free-riding. Rest assured that the grading standards are NOT lower for students working alone. Put another way, there is no handicap to working in pairs. There IS a penalty for working in pairs and handing in assignments separately.

The grade distribution will be as follows: Problem sets: 40%, Mid-term exam: 20%, Final exam: 40%.

1. Macroeconomics c. 1965

The first reading is from the first two chapters Sargent's first major book. Sargent's *Macroeconomics c. 1965*? These chapters are what Sargent taught between 1970 and 1974 when he was a "devoted user of Keynesian economics." Hicks' (1937) paper is where the IS-LM presentation of post-war static Keynesian macroeconomics was introduced. In 1965 it was still the standard way to present the model. You still find it in the majority of undergraduate macro classes and, despite the enormous advances in theory since then, it remains a very useful mental picture of the world for practical macroeconomics.

The status quo view in the 1960s was that the Keynesian model, with fixed money wages and where involuntary unemployment was possible, was an excellent representation of short-run behavior. In the long-run, wages respond to economic shocks and this in turn would induce the economy to return to full employment. The one difficulty was that under certain circumstances (the so-called liquidity trap problem, which has returned to haunt Japan in recent years), the adjustment process fails. Pigou (1943) introduced a modification to consumption demand, the concept of the wealth effect, which guaranteed the adjustment from the short-run Keynesian to the long-run classical world. The long- and short-run views of the world, linked by the Pigou effect, became known as the "neo-classical synthesis." This is the view that dominated macroeconomics for thirty years. And until the end of the sixties, it appeared to work very well.

Main Readings

Sargent, Thomas J. (1987): *Macroeconomic Theory*, second edition. Boston, MA: Academic Press, chapter 2. Required readings are sections 1, 3 and 5. We will only cover section 1 in class, and then build on that. But for the exams you will be expected to be familiar with sections 3 and 5.

Supplementary Readings

Hicks, John R. (1937): "Mr. Keynes and the Classics: A Suggested Interpretation." *Econometrica*, **5**(2):147-159.

Pigou, A.C. (1943): "The Classical Stationary State." *Economic Journal*, **53**:343-351.

2. Modeling Expectations

It will be apparent to all of you by now that expectations are fundamentally important in macroeconomics. Changes in expectations -- such as might be measured by the consumer confidence index, or by professional inflation forecasts -- can have profound impacts on the economy. But equally important from the perspective of studying macroeconomics is how we choose to model expectations. Different assumptions about how individuals form expectations lead us to dramatically different predictions about how the world works.

This section provides a quick overview of the evolution of expectations modeling, beginning

with early work by Metzler (1941) on extrapolative expectations, through the adaptive expectations framework developed by Cagan (1956) to study hyperinflations and later put to great use by Friedman (1968) and Phelps (1968), and finally to our modern framework of rational expectations.

Rational expectations were introduced formally in John Muth's (1961) *Econometrica* paper. Interestingly, in view of its radical impact on the profession, a large concern of the paper was to provide a theoretical foundation for exponentially weighted expectations (see also Muth's 1960 paper in *JASA*). Macroeconomics did not begin to exploit the concept for about a decade. The key early applications of rational expectations will be studied later. This section contains as required a reading a short paper by Sargent and Wallace (1973), which uses Cagan's hyperinflation model to illustrate in a simple setting how the choice of expectations formation (especially rational versus adaptive) is critical.

Required Readings

Metzler, Lloyd (1941): "The nature and stability of inventory cycles." *Review of Economic Statistics*, **23**(3):113-129.

Sargent, Thomas J., and Neil Wallace (1973): "The stability of models of money and growth with perfect foresight." *Econometrica*, **41**:1043-1048.

Supplementary Readings

Cagan, Phillip (1956): "'Monetary Dynamics of Hyperinflation", in Milton Friedman, (ed.) *Studies in the Quantity Theory of Money*.

Friedman, Milton (1968): "The role of monetary policy." *American Economic Review*, **58**:1-17.

Phelps, E.S. (1968): "Money-wage dynamics and labor-market equilibrium." *Journal of Political Economy*, 76:678-711.

Muth, John F. (1961): "Rational expectations and the theory of price movements." *Econometrica*, **29**(2):315-335.

Muth, John F. (1960): "Optimal properties of exponentially weighted forecasts." *Journal of the American Statistical Association*, **55**, no. 290: 299-306.

3. Solving Linear Rational Expectations Models

In a tribute to Lucas [Expectations and the Nonneutrality of Lucas], Thomas Sargent wrote that one of the reasons that it took so long for rational expectations to be incorporated into the literature was the technical difficulty of the models. The papers in this section provide the necessary technical training. Blanchard's paper is a particularly clear exposition, but it is less complete than the others. One of the disturbing features of RE models is the multiplicity of solutions they can give rise to. Some authors, such as Ben McCallum, have suggested ways to eliminate some of the solutions from consideration. Amusingly, other researchers have used our failure to establish uniqueness into an applied field.

Required Reading

Thompson, Peter (2004): "Difference Equations." Chapter 3 in *Lecture Notes on Dynamic*

Modeling. We will study section 2 of chapter 3 although some preparatory material from section 1 will be necessary.

Supplementary Readings

Blanchard, Olivier J. (1979): "Backward and Forward Solutions for Economies with Rational Expectations." *American Economic Review, Papers and Proceedings*, **69**(2):114-118.

Taylor, J. (1977): "Conditions for Unique Solutions in Stochastic Models with Rational Expectations." *Econometrica*, **45**:1377-85.

Blanchard, O.J. and C.M. Kahn (1980): "The Solution of Linear Difference Models under Rational Expectations." *Econometrica*, **48**:1305-1311.

McCallum, Bennett T. (1983): "On Non-Uniqueness in Rational Expectations Models: An Attempt at Perspective." *Journal of Monetary Economics*, **11**:139-168.

4. The Lucas Critique

One of the earliest salvos of the rational expectations revolution in macroeconomics was the claim that much of what we economists thought they knew about policy analysis was wrong. In a path-breaking paper, Robert Lucas (1976) pointed out that existing models in which expectations were not fully endogenous would often give misleading results when used to assess the effects of policy. Using a model with fixed coefficients estimated from historical data to evaluate the consequences of new policies would mislead because (i) the change in policy will affect expectations, and (ii) the estimated coefficients are sensitive to changes in expectations. This claim is true whenever expectations are forward looking (they need not be rational, although Lucas assumed them to be). The implications of Lucas' critique of what were then conventional methods of policy assessment were sufficiently profound to affect the field forever.

The next two papers are short empirical evaluations of whether the Lucas critique is quantitatively important. Using changes in monetary policy in the early 1980's as a form of natural experiment, Taylor and Blanchard assess whether key empirical relationships were altered. They find some evidence that the Lucas critique is indeed quantitatively important.

Required Reading

Lucas, Robert E. (1976): "Econometric Policy Evaluation: A Critique." In Karl Brunner and Allan H. Meltzer, eds., *The Phillips Curve and Labor Markets*, Carnegie-Rochester Conference Series on Public Policy, 1:19-46. Reprinted in R.E. Lucas, Jr., *Studies in Modern Business Cycle Theory*. Cambridge, MA: MIT Press, pp. 104-130.

Taylor, John B. (1984): "Recent changes in macro policy and its effects: some time-series evidence." *American Economic Review, Papers and Proceedings*, **74**(2):206-210.

Blanchard, Olivier J. (1984): "The Lucas critique and the Vocker deflation." *American Economic Review, Papers and Proceedings*, **74**(2):211-215.

Supplementary Reading

Linde, Jesper (2001): "Testing for the Lucas critique" A quantitative investigation." *American Economic Review*, **91**(4):986-1005

5. Policy Ineffectiveness under Rational Expectations

A. Lucas' Policy Ineffectiveness Proposition

A second salvo at traditional macroeconomics to come from the rational expectations revolution concerned the ability of central banks to fine tune output. Lucas (1972) showed how, under rational expectations and several other auxiliary assumptions, a central bank cannot systematically adjust monetary policy to influence the time path of output. Remarkably, he showed how this was true while at the same time showing that there is nonetheless a correlation between the money supply and output. Lucas' paper is, unfortunately, rather hard to read. We will look at a version of the so-called policy ineffectiveness proposition by Sargent and Wallace. Their paper has the virtue of being written in terms that were more familiar to macroeconomists.

B. The Keynesian Response

The initial Keynesian response to the policy ineffectiveness proposition was no doubt one of dismay. Rational expectations was clearly an attractive way to model beliefs, but it had the unfortunate consequence of undermining policy recommendations that had been the mainstay of Keynesian macroeconomic policy. However, this attribution to RE alone of policy ineffectiveness turned out to be a misreading of the Lucas paper. In addition to RE, policy ineffectiveness required a set of additional assumptions, among them that prices are flexible and that the central bank and the public share the same information. The early Keynesian responses to the policy ineffectiveness proposal were concerned with reinstating the price rigidities that Lucas and others had removed. Fischer (1977) introduced two-period wage contracts that allowed monetary policy to have a one-period impact on output. Taylor (1979) extended the framework to increase the degree of persistence. The assumption about information is addressed in the problem set. It was always known that neutrality will vanish if the central bank has an information advantage relative to the private sector (because there will always be an unanticipated component to monetary policy). Romer and Romer (2000) carefully study the information forecasts of the Fed compared with those of the private sector. They conclude that the Fed does indeed possess considerable information advantages.

C. Ricardian Equivalence

While the early policy relevance of rational expectations to monetary economics took center stage during the 1970s, RE also generated some profound results in fiscal policy. Prominent among these was the concept of Ricardian equivalence, which states that the way a government finances its expenditure (i.e. debt or taxes) has no real impacts in a world that must satisfy the transversality conditions of a representative agent optimization problem. The classic paper is Barro (1974), who was not aware that David Ricardo had thought of, and rejected, the idea a long time ago. Bernheim (1987) provides a theoretical and empirical review. The essence of the literature is that Barro's result is extremely fragile (i.e. easily overturned by plausible alternative models), and so the issue of Ricardian equivalence is one of evaluating its empirical importance. The evidence is mixed on this question, however.

Required Reading

Sargent T.J. and N. Wallace (1975): "Rational Expectations, the Optimal Monetary Instrument, and the Optimal Money Supply Rule", *Journal of Political Economy*, **83**:241-254.

Fischer, Stanley (1977): "Long-Term Contracts, Rational Expectations, and the Optimal Money Supply Rule", *Journal of Political Economy*, **85**:191-205.

Taylor, John (1979): "Staggered Wage Setting in a Macro Model", *American Economic Review Papers and Proceedings*, **69**:108-113.

Supplementary Reading

Lucas, Robert E. (1972): "Expectations and the Neutrality of Money." *Journal of Economic Theory*, **4**:103-124.

Lucas, Robert E., and Thomas Sargent (1979), "After Keynesian Macroeconomics," in *After the Phillips Curve: The Persistence of High Inflation and High Unemployment* (Boston: Federal Reserve Bank of Boston), chapter 19.

Romer, Christina D., and David H. Romer (2000): "Federal Reserve Information and the Behavior of Interest Rates." *American Economic Review*, **90**(3):429-457.

Barro, Robert J. (1974): "Are Government Bonds Net Wealth?" *Journal of Political Economy*, **82**(6):1095-1117.

Bernheim, B. Douglas (1987): "Ricardian Equivalence: An Evaluation of Theory and Evidence." *NBER Macroeconomics Annual*, **2**:263-303.

6. Time Inconsistency

The majority view in the profession now appears to be that monetary and fiscal policy do have temporary effects on output. Even so, RE had yet a third salvo on the intellectual status quo: time inconsistency. Time inconsistency arises whenever (i) agents' actions today depend on the policymakers action tomorrow, (ii) the agents' action affects the policymaker's social welfare function, and (iii) there is no commitment technology through which a policymaker can tie itself to announced policies.

There is now a large literature on the concept. The first two readings explain how time inconsistency arises and its implications for the conduct of policy. Kydland and Prescott (1977) is the classic reference on the concept of time inconsistency, and contains applications to both monetary and fiscal policy. The essence of the papers is (i) that time-consistent policies are inferior to the optimal, commitment policy, (ii) optimal control, which implicitly assumes there is a commitment technology, will often yield incorrect predicts about policy choices.

Barro and Gordon (1983) ask how a central bank can construct some sort of commitment mechanism through reputation effects. Rogoff's paper is a nice piece that explains how time inconsistency can make it in our interests to appoint a central banker who is more conservative than society.

The supplementary readings are all notable papers on the topic of time consistency. Fischer

(1980) studies the Kydland-Prescott fiscal policy problem in more detail and is an excellent read, while Barro (1983) further explores and refines his ideas about reputation. Chari and Kehoe (1990) explores the link between the macroeconomic models and game theory concepts, Stokey (1989) shows that the reputation solution is quite generally applicable, not just to questions of monetary or fiscal policy. Bulow and Rogoff (1989) apply the concept to the question of forgiving third world debt.

Many central banks have resolved the time inconsistency issue by effectively behaving as though they have imposed rules on themselves. What do these rules look like? John Taylor pioneered the analysis of central bank rules in the early 1990s (go here for his links to useful material). Kozicki (1999) asks how useful this work has been.

Required Readings

Kydland, Fynn E., and Edward C. Prescott (1977): "Rules Rather than Discretion: The Inconsistency of Optimal Plans", *Journal of Political Economy*, **85**(3):473-491.

Barro Robert J., and David B. Gordon (1983): "Rules, Discretion, and Reputation in a Model of Monetary Policy." *Journal of Monetary Economics*, **12**:101-20.

Rogoff, Kenneth (1985): "The Optimal Degree of Commitment to an Intermediate Monetary Target." *Quarterly Journal of Economics*, **100**:1169-1190.

Supplementary Readings

Fischer, Stanley (1980): "Dynamic Inconsistency, Cooperation, and the Benevolent Dissembling Government." *Journal of Economic Dynamics and Control*, **2**:93-107.

Chari, V.V., and Patrick J. Kehoe (1990) "Sustainable Plans." *Journal of Political Economy*, **98**(4):783-802.

Barro, Robert J. (1986): "Reputation in a Model of Monetary Policy with Incomplete Information." *Journal of Monetary Economics*, **17**:1-20.

Persson, Torsten, and Guido Tabellini (1993): "Designing Institutions for Monetary Stability", *Carnegie-Rochester Conference Series on Public Policy*, **39**.

Stokey, Nancy L. (1989): "Reputation and Time Consistency." *American Economic Review, Papers and Proceedings*, **79**(2):134-139.

Bulow, Jeremy, and Kenneth Rogoff (1989): "Sovereign Debt: Is to Forgive to Forget?" *American Economic Review*, **79**(1):43-50.

Kozicki, Sharon (1999): "How Useful are Taylor Rules for Monetary Policy?", *Federal Reserve Bank of Kansas Economic Review*.

All the papers listed above have been reprinted in:

Persson, Torsten and Guido Tabellini (1994): *Monetary and Fiscal Policy*. Volume I: Credibility, Cambridge, MA: MIT Press,

which contains many other interesting papers.

7. The New Classical Revolution: Business Cycles

The New Classical revolution in macroeconomics finds important places in both the study of business cycles and in monetary policy. The two applications are closely related of course, but can nonetheless be studied separately. This section concentrates on the literature related specifically to business cycles. The New Classical paradigm, in this setting involves the study of business cycles in the setting of market-clearing, competitive equilibria. Students have already had a lot of exposure to competitive equilibrium business cycle models, at least the real ones (as opposed to monetary ones). The readings here are therefore highly selective in a way that fits with the aims of this course. The literature can be divided into two groups: models in which money is important, and models in which it is absent. The seminal monetary model is (again) Lucas 1973. This is hard going and it has been put into the supplementary reading list. The paper is accompanied by more accessible studies (in rather different settings) by Lucas (1975) and by Lucas and Stokey (1983). The most famous real business cycle (RBC) model is Kydland and Prescott (1982). Again, this has been put in the supplementary list, although it is an accessible piece.

My recommended text for the main reading is Lucas' Yrjo Jahnsson lectures, given in Helsinki in 1985 and published in 1987. It is still a great read. It combines a review of models (real and monetary) to 1985, an evaluation of the evidence, and an insight into the mindset of new classical economists, all packaged in Lucas' wonderful writing style.

In the supplementary readings, the papers by Plosser and Prescott are relatively standard RBC models. Hansen and Wright (1992) describe some more recent modifications to the basic model and evaluate their performance. The Hansen and Prescott paper is short and readable, and is a good example of what people do with RBC models when they are not in a mood to debate whether they are any good at all.

Finally, Summers (1986) and Prescott (1986) offer evaluations from two sides of the field; they do a pretty good job of showing how mean the debate on RBC theory can get.

Required Reading

Lucas, Robert E. (1987): *Models of Business Cycles*. London: Blackwell.

Supplementary Readings

A. Monetary Business Cycles

Lucas, Robert E. (1973): "Expectations and the Neutrality of Money." *Journal of Economic Theory*, **4**:103-124.

Lucas, Robert E. (1975): "An Equilibrium Model of the Business Cycle." *Journal of Political Economy*, **83**(6):1113-1144.

Lucas, Robert E., and Nancy L. Stokey (1983): "Optimal Fiscal and Monetary Policy in an Economy Without Capital." *Journal of Monetary Economics*, **12**:55-93.

B. Real Business Cycles

Kydland, Finn E., and Edward C. Prescott (1982): "Time to Build and Aggregate Fluctuations." *Econometrica*, **50**:1345-1370.

Plosser, Charles (1989): "Understanding Real Business Cycles." *Journal of Economic Perspectives*, **3**:51-78.

- Prescott, Edward C. (1986): "Theory Ahead of Business Cycle Measurement." *Federal Reserve Bank of Minneapolis Quarterly Review*, **10**:23-27 (Fall). Reprinted in Preston J. Miller, ed., *The Rational Expectations Revolution. Readings from the Front Line*. Cambridge, MA: MIT Press (1994).
- Hansen, Gary D. and Edward C. Prescott (1993): "Did Technology Shocks Cause the 1990-91 Recession?" *American Economic Review Papers and Proceedings*, **83**(2):280-86.
- Hansen, Gary D. and Randall Wright (1992): "The Labor Market in Real Business Cycle Theory." *Federal Reserve Bank of Minneapolis Quarterly Review*, **10**: (Fall). Reprinted in Preston J. Miller, ed., *The Rational Expectations Revolution. Readings from the Front Line*. Cambridge, MA: MIT Press (1994).
- Summers, Lawrence H. (1986): "Some Skeptical Observations on Real Business Cycle Theory." *Federal Reserve Bank of Minneapolis Quarterly Review*, **10**: (Fall). Reprinted in Preston J. Miller, ed., *The Rational Expectations Revolution. Readings from the Front Line*. Cambridge, MA: MIT Press (1994).
- Prescott, Edward C. (1986): "Response to a Skeptic." *Federal Reserve Bank of Minneapolis Quarterly Review*, **10**: (Fall). Reprinted in Preston J. Miller, ed., *The Rational Expectations Revolution. Readings from the Front Line*. Cambridge, MA: MIT Press (1994).
- Mankiw, N. Gregory (1989): "Real Business Cycles: A New Keynesian Perspective." *Journal of Economic Perspectives*, **3**:79-90.

8. New Keynesian Business Cycles

As we have seen, Fischer (1977) and Taylor (1979) introduced wage-rigidity to the Keynesian model in order to restore an effect on output of monetary shocks. But although they had modernized Keynesian macroeconomics by incorporating rational expectations, they had left another failure of traditional modeling untouched: they simply assumed nominal wage stickiness, without providing a theory of why firms would not adjust nominal wages. A set of theories were, however, soon developed. Collectively they are known as "efficiency wage theories". Shapiro and Stiglitz (1984) provide one such example.

A problem with the wage-stickiness response is that it generates a countercyclical (and counterfactual) real wage. Mankiw (1985) and Akerlof and Yellen (1985) addressed this problem by introducing, and providing theories for, stickiness in nominal output pricing behavior. Mankiw does this by assuming there are costs to changing nominal prices; Akerlof and Yellen do so by introducing the concept of "near-rationality".

But the Keynesian response was by no means complete. In the next stage, Ball and Romer (1990) noted that nominal stickiness alone cannot induce output fluctuations that are large enough. They combined nominal rigidities with real rigidities (economic structures that reduce the amount by which firms would like to change prices even if they could do so costlessly) in a single model; the real rigidities by themselves do not create a real effect of money, but they amplify the effect of nominal rigidities. There are numerous possible sources of real rigidities.

Nonetheless, this was only a partial solution. Chari, Kehoe and McGrattan (2000) developed

and calibrated a sophisticated new Keynesian general equilibrium model. Their main finding was that, for realistic parameter values, the new Keynesian framework still cannot generate the observed persistence in monetary effects. This is essentially where the Keynesian business cycle framework remains today.

Required Readings

Shapiro, Carl, and Joseph E. Stiglitz (1984): "Equilibrium Unemployment as Worker-Discipline Device." *American Economic Review*, **74**:433-444.

Mankiw, N. Gregory (1985): "Small Menu Costs and Large Business Cycles: A Macroeconomic Model of Monopoly", *Quarterly Journal of Economics*, **100**:455-470.

Ball, Laurence, and David Romer (1990): "Real Rigidities and the Non-Neutrality of Money", *Review of Economic Studies*, **57**:183-203.

Supplementary Readings

Ball, Laurence, and N. Gregory Mankiw (1994): "A Sticky-Price Manifesto", *Carnegie-Rochester Conference Series*, December.

Akerlof, George A. and Janet L. Yellen (1985): "A Near-Rational Model of the Business Cycle with Wage and Price Inertia", *Quarterly Journal of Economics*, Supplement: 823-38.

Chari, V.V., Partick J. Kehoe and Ellen R. McGrattan (2000): "Sticky Price Models of the Business Cycle: Can the Contract Multiplier Solve the Persistence Problem?", *Econometrica*, **68**(5):1151-1179

Romer, David (1996): *Advanced Macroeconomics*, New York: McGraw-Hill, chapter 6.

Yellen, Janet L. (1984): "Efficiency Wage Models of Unemployment." *American Economic Review*, **74**(2):200-205.

Akerlof, George A. (1982): "Labor Contracts as Partial Gift Exchange." *Quarterly Journal of Economics*, **97**(4):543-569.

9. Coordination Failures

Coordination failures arise in models in which there are multiple Nash equilibria. For example, investment by one firm may only be profitable if all other firms in the economy invest. Such a model may have two equilibria: no-one invests and everyone invests. Both equilibria are Nash, and both are rational in the sense that expectations are fulfilled. Cooper and John (1988) provide a general framework for this analysis, highlighting the fact that strategic complementarities are central to the analysis. Bryant, Diamond and Shleifer provide some straightforward and interesting applications of coordination games. Bryant's model has complementarities in input use, Diamond's in trading costs, and Shleifer's in innovation.

Required readings

Cooper, Russell, and Andrew John (1988): "Coordinating Coordination Failures in Keynesian Models." *Quarterly Journal of Economics*, **103**:441-463.

Shleifer, Andrei (1986): "Implementation Cycles." *Journal of Political Economy*, **94**(6):1163-

1190.

Supplementary Readings

Bryant, John (1983): "A Simple Rational-Expectations Keynes-Type Model." *Quarterly Journal of Economics*, **98**:525-528.

Diamond, Peter A. (1982): "Aggregate-Demand Management in Search Equilibrium." *Journal of Political Economy*, **90**(5):881-894.

Cooper, R., D.V. DeJong, R. Forsyth, and T.W. Ross (1990): "Selection Criteria in Coordination Games." *American Economic Review*, **80**:218-233

Cooper, Russell (1999): *Coordination Games*. Cambridge: Cambridge University Press.

10. The Impact of Rational Expectations

There are an enormous number of articles talking about the importance of RE. Most were written in the 1980s and most were written from a New Classical perspective. The readings contain a productive selection of these.

Required Readings

Lucas, Robert E., and Thomas J. Sargent (1979): "After Keynesian Macroeconomics." *Federal Reserve Bank of Minneapolis Quarterly Review*. Reprinted in Lucas and Sargent, eds., *Rational Expectations and Econometric Practice*. Minneapolis: University of Minneapolis Press, 295-319.

Sargent, Thomas J. (1996?): "Expectations and the Nonneutrality of Lucas." Mimeo: Stanford.

Supplementary Readings

McCallum, Bennet T. (1980): "Rational Expectations and Macroeconomic Stabilization Policy." *Journal of Money, Credit, and Banking*, **12**(4):716-746.

Sargent, Thomas J. (1982): "Beyond Demand and Supply Curves in Macroeconomics." *American Economic Review, Papers and Proceedings*, **72**(2):382-389.

Sargent, Thomas J. (1980): "Rational Expectations and the Reconstruction of Macroeconomics." *Federal Reserve Bank of Minneapolis Quarterly Review*, Summer. Reprinted in Preston J. Miller, ed., *The Rational Expectations Revolution. Readings from the Front Line*. Cambridge, MA: MIT Press.

Fellner, William (1980): "The Valid Core of Rationality Hypotheses in the Theory of Expectations." *Journal of Money, Credit, and Banking*, **12**(4):763-787.

Barro, Robert J. (1984): "Rational Expectations and Macroeconomics in 1984." *American Economic Review, Papers and Proceedings*, **74**(2):179-182

11. Rational Expectations: Critiques

There appear to be three types of critics: behavioral microeconomists, macroeconomists of the old school, and wackos. The first and last of these are outside our terms of reference. Here are some readings from the middle group. The last reading in the list is a useful counterweight. Rotemberg provides a defense against frequent early econometric rejections of rational expectations.

Required Readings

Tobin, James (1980): "Are New Classical Models Plausible Enough to Guide Policy?" *Journal of Money, Credit and Banking*, **12**(4): 788-799.

Rotemberg, Julio J. (1984): "Interpreting the Statistical Failures of Some Rational Expectations Macroeconomic Models." *American Economic Review, Papers and Proceedings*, **74**(2): 188-193.

Supplementary Readings

Okun, Arthur M. (1980): "Rational-Expectations-with-Misperceptions As a Theory of the Business Cycle." *Journal of Money, Credit and Banking*, **12**(4): 817-825.

Cagan, Phillip (1980): "Reflections on Rational Expectations." *Journal of Money, Credit and Banking*, **12**(4): 826-832.

Haberler, Gottfried (1980): "Critical Notes on Rational Expectations." *Journal of Money, Credit and Banking*, **12**(4):833-836.

