NBER WORKING PAPER SERIES

# THE RATIONAL EXPECTATIONS REVOLUTION: A REVIEW ARTICLE OF: PRESTON J. MILLER, ED.: THE RATIONAL EXPECTATIONS REVOLUTION, READINGS FROM THE FRONT LINE

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Working Paper No. 5043

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
February 1995

This paper is part of NBER's research programs in Economic Fluctuations and Monetary Economics. Any opinions expressed are those of the author and not those of Columbia University, the Federal Reserve Bank of New York, the Federal Reserve System, or the National Bureau of Economic Research.

NBER Working Paper #5043
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## ABSTRACT

This review article of Preston Miller's The Rational Expectations Revolution, Readings From the Front Line focuses on the impact of this research on macroeconomic policymaking. Although policymakers have generally not accepted the equilibrium business cycle models advocated in many of the articles in the Miller volume and even continue to use traditional Keynesian macroeconometric models for policy analysis, several of the lessons from the rational expectations revolution have become central in thinking about policymaking. Policymakers now recognize the importance of expectations and credibility to the outcomes of particular policies. This means that they are more cautious in their use of econometric models and are less likely to advocate discretionary activist stabilization policies. They are also more willing to design policymaking to avoid the time-inconsistency problem and take a long rather than a short-run view, thereby avoiding myopic policies that produce undesirable outcomes.

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## I. The Rational Expectations Revolution

By the 1960s, economists, armed with Keynesian macroeconomic models that described how government policies could be used to manipulate employment and output, felt that activist policies could reduce the severity of business cycle fluctuations without creating inflation. Managing the aggregate economy was viewed as an engineering problem in which optimal control algorithms using econometric models would allow policymakers to fine tune the economy to produce maximum employment with only slight inflation consequences. When Keynesian economists got their chance to put their policies into practice in the 1960s and 70s, the results were not what they had anticipated. The economic record from that period was not a happy one: Inflation accelerated, with the inflation rate often climbing above 10%, while the unemployment performance deteriorated from the performance of the 1950s.

In the early 1970s, Robert Lucas launched the rational expectations revolution with a series of papers Lucas (1972, 1973) and most importantly his famous paper, "Econometric Policy Evaluation: A Critique."[1] Ever since then macroeconomics has never been the same.

The so-called Lucas critique, presented an argument that had devastating implications for the usefulness of Keynesian econometric models for evaluating policy. While Lucas' critique had nothing to say about the usefulness of these models as

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[1]Although already very influential by the time I started graduate school in 1973, this paper was not published until 1976 as Lucas (1976). Note that although Muth (1960, 1961) introduced the idea of rational expectations ten years earlier, his work went largely unnoticed until it was resurrected by Lucas.

forecasting tools, he argued that they could not be relied on to evaluate the potential impact of particular policies on the economy.

Policy evaluation with Keynesian econometric models involves an assumption that the parameter estimates in the model's equations which have been estimated from past data are invariant to changes in policy. Then a policymaker can conduct simulations under different policy scenarios to decide which scenarios produce the best outcomes. Going even further, optimal control procedures derived from the engineering literature can be used to solve for the optimal policy given a particular loss function. Lucas' challenge to this procedure for evaluating policies is based on a simple principle of rational expectations theory: The way expectations are formed (the relationship of expectations to past information) changes when the behavior of forecasted variables changes. So when policy changes, the relationship between expectations and past information will change, and because expectations affect economic behavior, the relationships in the econometric model will change. The econometric model which has been estimated with past data is then no longer the correct model for evaluating the response to this policy change and it can prove to be highly misleading.

Researchers at the Federal Reserve Bank of Minneapolis, including Thomas Sargent and Neil Wallace of the University of Minnesota, were working on applying optimal control methods using econometric models to decide on what optimal monetary policy would be. Upon receiving drafts of the Lucas papers, they realized that pursuing

policy evaluation with these Keynesian econometric models was a dead end.[2] The rational expectations paradigm was then wholeheartedly adopted by the research staff of the Federal Reserve Bank of Minneapolis, who then became the most active advocates for rational expectations within the Federal Reserve System. The resulting research that has appeared in publications of the Federal Reserve Bank of Minneapolis has been collected in an excellent volume edited by Preston J. Miller, The Rational Expectations Revolution: Readings from the Front Line.

The use of the phrase "front line" in Miller's title to the volume indicates that the research contained in it was directed at policy. Given the title and my current employment as a policymaking economist at the Federal Reserve Bank of New York, it seems natural for me to focus on the impact of this research on macroeconomic policymaking in this review essay.

## II. The Rational Expectations Approach to Macroeconomic Policymaking

Part I of the book outlines the core of ideas in the rational expectations revolution with articles on the rational expectations approach to macro policy. Appropriately, it opens with Lucas and Sargent's well-known paper "After Keynesian Economics" which was published in 1979. This paper aggressively lays out the rational expectations

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[2]Stanley Fisher was another example of a prominent researcher who was working with optimal control methods to do econometric policy evaluation, but immediately dropped this line of research upon reading Lucas's "Econometric Policy Evaluation: A Critique."

manifesto: it attacks the Keynesian macroeconomics paradigm and suggests an alternative paradigm which is the basis for most of the papers in this volume. Having read this paper fifteen years ago, I still found it a joy to read because it clearly reminds us of where macroeconomics was twenty-years ago and how much it has changed since then. The rational expectations manifesto laid out by Lucas and Sargent has two basic positions: First, Keynesian macroeconometric models cannot be relied on to evaluate or formulate monetary, fiscal, or other types of policy. Second, equilibrium macroeconomic models can and should be developed that assume that agents have rational expectations and act to maximize their private interests in markets that clear. This paradigm then allows these models to avoid the Lucas critique problem inherent in Keynesian macroeconometric models and to be used to evaluate and formulate policy.

Over the past fifteen years have these two positions won the day? Have policymakers heeded the rational expectations criticisms of Keynesian macroeconometric models and switched to equilibrium models as a basis of their policy analysis. The answer is yes and no. Despite the acceptance in principle of the Lucas critique by the majority of the economics profession, surprisingly we still find that most policymakers rely quite heavily on Keynesian macroeconometric models, such as the DRI, Wharton, and Federal Reserve Board models, to help them in formulating policy. They not only use them to forecast the economy, but also conduct simulations to provide them with guidance as to what might be the effect of different policy stances. Indeed the use of Keynesian macroeconometric models for policy analysis is widespread, not only in the

United States, but abroad as well.

Why do policymakers rely on models for policy evaluation which the rational expectations revolution clearly says are inappropriate for this purpose? The answer is that equilibrium models which avoid the Lucas critique and have followed the paradigm suggested by Lucas and Sargent are not felt by policymakers to provide a realistic description of the economy. Thus for want of anything better, policymakers have found that they have to rely on models that are seriously flawed.

Does the reliance on Keynesian macroeconometric models by policymakers mean that the Lucas-Sargent manifesto has been completely ignored by policymakers? Are policymakers using macroeconometric models in the same way that they did before the rational expectations revolution occurred? My experience as a policymaking economist suggests not. Before the rational expectations revolution, many in policymaking circles began to take the view that they could use Keynesian macroeconometric models with optimal control techniques developed in the engineering literature to derive optimal policy paths. This engineering perspective for macroeconomic policymaking, which looked like it might become dominant, is now dead. Although policymakers still rely on Keynesian macroeconometric models, they realize that parameters in these models are unlikely to remain invariant with changes in policy. Thus, they use these models as a guide for policy, but take them with a much bigger grain of salt.

Chapter 2 in the Miller volume, Sargent's "Rational Expectations and the Reconstruction of Macroeconomics," elaborates on some of the arguments in Lucas and

Sargent's Chapter 1, and makes the point that what policymakers should do is focus on what is the appropriate policy regime, rather than focus on specific policy actions. This lesson from the rational expectations revolution has had a major impact on policymaking circles. Policymakers now recognize that the choice of a policy regime affects the behavioral relationships in a macro model. For example, a policy regime which stresses keeping inflation low, rather than keeping employment high, is likely to lead to better wage and price outcomes, and possibly better output performance as well. The rational expectations revolution has convinced policymakers that expectations are a key element in agents' economic behavior, and thus, in deciding on what policies to implement, they must take the impact on expectations into account. Policymakers thus do make use of Keynesian macroeconometric models to provide them with some guidance on policy, but they rely on them less heavily than they did before the rational expectations revolution. The rational expectations revolution has had an impact because it has forced policymakers to think more in terms of choosing the most appropriate policy regime.

The third chapter contains an article by Chari on the time-consistency problem. A series of papers by Kydland and Prescott (1977), Calvo (1978) and Fischer (1980) showed that rational expectations can lead to time inconsistency of optimal policy. Before the rational expectations revolution, it was believed that optimal policy could be designed by maximizing the policymaker's objective function at a given point of time and planning a policy path for today and the future. What these papers and Chari's point out is that designing policy in this way can lead to time inconsistency, that is, when policymakers

get to the next period, using this same procedure, they would like to renege on the previous policy path and choose an alternative path even if there are no unanticipated changes in circumstances. The problem is that the continual reneging on the policy path leads economic agents to recognize that the stated policy path will not in fact be carried out. Since these agents therefore believe that a different set of future policies will be implemented, the result is that this policy procedure leads to policies that make economic agents in the economy worse off.

A graphic example of the time-consistency problem is found in the rational expectations model of Barro and Gordon (1983). They show that policymakers who pursue an output objective will produce a time-inconsistent policy which leads to a sub-optimal policy in which inflation arises and yet output performance is not improved. Welfare would be improved by policymakers abandoning any attempts to improve output performance and instead a focus on keeping inflation low.

What implications does the time-consistency literature have for policy? First, as Chari's article points out, precommitment to a policy regime can overcome the time-inconsistency problem and lead to better policy outcomes. This conclusion has led some in policymaking circles to call for binding precommitments for their policies to avoid time-inconsistency. Indeed, the time-consistency literature has shifted the debate on rules versus discretion. Before the rational expectations revolution, policymakers almost invariably argued that discretion would lead to better policy outcomes. Their argument was based on the view "who knows what the future will bring" and so policymakers must

have the flexibility to react to whatever surprises occur. The time-consistency literature counters this view by indicating that discretion leads to time-inconsistency and thus sub-optimal policies. Policymakers and even some politicians understand this point. They argue for binding constraints on policymakers, whether they are regulators of the banking system where discretion led to suboptimal policies that helped produce the S&L crisis, or monetary authorities who, by attempting to smooth the business cycle, produced higher inflation. Furthermore, as illustrated by the current debate on whether there should be a balanced budget amendment to the Constitution, the desirability of precommitment is at the center of public debate.

The time-consistency literature has also led economists to recognize that another way of achieving precommitment for a policy regime is by the design of policymaking institutions (e.g Rogoff (1985)). By making central banks more independent of the political process and by giving them a statutory objective of price stability only, central banks will not go the Barro-Gordon route and pursue a time-inconsistent policy that tries to improve output performance and thereby leads to inflation. The time-consistency perspective provided by the rational expectations revolution has had a major impact in central banking circles. Central banks in many countries have been eager to have their hands tied by having governments impose on them a sole objective of price stability. Indeed, recent legislation in many countries has increased the independence of the central bank and has stipulated price stability as the primary objective for monetary policy. Countries ranging from New Zealand to France have been choosing this route, and the

proposed European central bank in the 1991 Maastricht Treaty of European Union has been designed to be highly independent with price stability as its primary objective.

## III. Monetary and Budget Policy Analysis

The next two parts of the Miller volume focus on monetary and budget policy analysis. Although the papers in these two parts do have models with optimizing agents and stress policy rules, important elements of the rational expectations viewpoint, the type of research in these papers was prevalent before the rational expectations revolution. Thus, they are not unique to the rational expectations revolution although they are related to it, but rather fit into the neoclassical paradigm.

The most influential set of papers in these two parts is the unpleasant monetarist arithmetic debate that took place between Sargent, Wallace and Miller on one side and Darby on the other. Sargent and Wallace's paper, "Some Unpleasant Monetarist Arithmetic," first published in 1981, points out that the government budget constraint implies that there is an intimate relationship between monetary and fiscal policy. Under the assumption that the real interest rate is greater than the growth rate of the economy, they show that if the government chooses a path of permanently high budget deficits net of interest, then the monetary authorities will be forced to monetize the debt at some future date. The result of this unpleasant monetarist arithmetic is that attempts to keep inflation low by keeping monetary base growth low today will only lead to higher

inflation in the future. The reason for the unpleasant monetarist arithmetic is that with a higher real interest rate than the growth of the economy, the permanently higher deficits net of interest lead to growth in the real stock of bonds that is higher than the growth rate of the economy. Since this cannot go on forever because there is a limit to the amount of bonds relative to the size of the economy that the public will be willing to hold, eventually the monetary authorities must monetize the debt by purchasing it with the monetary base, thereby leading to an expansion of the money supply and inflation.

The Sargent-Wallace paper has received wide attention because of the supply-side tax cuts put into place by the Reagan Administration which led to huge peace-time deficits in the 1980s. Supply-siders believed that these deficits would not have inflationary consequences, while the Sargent-Wallace argument gave ammunition to those who believed that these deficits would be inflationary.

Michael Darby, who was a Treasury official under Reagan, responded to Sargent and Wallace in 1984, in his paper entitled, "Some Pleasant Monetarist Arithmetic." He demonstrates that there is no unpleasant monetarist arithmetic if the real interest rate is less than the growth rate of the economy. In this case the economy grows sufficiently fast relative to the bonds' real interest rate so that increased deficits do not lead to an ever expanding stock of debt relative to the size of the economy. Hence the increased deficits can be financed by bond issues alone without resorting to monetization. Darby argues that the empirical evidence supports a real interest rate on bonds that is less than the growth rate of the economy in the United States and so there is no unpleasant monetarist

arithmetic. Clearly this was a position that the supply-siders in the Reagan Administration were pleased with since it indicated that the deficits arising from the Reagan tax cuts were not inconsistent with a noninflationary monetary policy.

Miller and Sargent replied to Darby by showing that even though the real interest rate has been below the growth rate of the U.S. economy, this has been the result of responsible fiscal policy in the past. With high net-of-interest deficits of the type that occurred with the Reagan tax cuts, the stock of debt relative to GDP would rise and this would be expected to lead to higher real interest rates which could then exceed the growth rate of the economy. The result would be an economy in which unpleasant monetarist arithmetic ruled.

The debate on unpleasant monetarist arithmetic has stimulated much recent research on the interdependence of monetary and fiscal policy. In the aftermath of the debate, who appears to be right. Are budget deficits inflationary, as the unpleasant monetarist arithmetic suggests?

In hindsight we know that the Reagan budget deficits did not lead to high inflation. Indeed, inflation in the United States has declined dramatically since 1981. Does this mean that Darby was right and Sargent, Wallace and Miller were wrong? Not necessarily. The key to unpleasant monetarist arithmetic is the assumption that the government chooses a path of fiscal policy that is independent of monetary policy and which has permanent high net-of-interest deficits. What actually occurred is that, despite initially high net-of-interest deficits, these deficits have declined to near zero in

subsequent years. Thus the debt to GDP ratio, which reached a low of around 25% in the early 1970s, has plateaued out at around 50% currently, well below the ratio of above 100% reached immediately after World War II. Thus the warning of unpleasant monetarist arithmetic is still a cogent one if a government decides to pursue permanently irresponsible fiscal policy. However, there do appear to be constraints on governments which keep them from doing this, leaving monetary policy decisions as the primary source of inflation.

Other interesting papers in the parts of the volume on budget and monetary policies are two papers by Wallace that look at how fiat monies get their value. In his paper on a legal restrictions theory of money demand, Wallace asks why fiat money which does not earn interest is held when bonds are available which do pay interest. Wallace's answer is that people are willing to hold non-interest bearing money because of legal restrictions on using interest-bearing bonds in transactions. In his paper on the foreign exchange market, he asks a similar question of what sets an exchange value between different fiat currencies. After all, they are just pieces of paper so that any exchange value is possible. Wallace takes the view that it is financial restrictions like capital controls which make different currencies imperfect substitutes, thereby fixing their exchange value. In looking at why fiat money has value, I sense that legal restrictions may be only part of the story. Network externalities, i.e. the idea that money has value because everyone agrees that it has value, means that fiat money may be valued and used in transactions even if there were no legal restrictions mandating its use. Similarly, one

fiat currency might have a deterministic exchange value relative to another even if there are no legal financial restrictions like capital controls. As long as economic agents in different countries prefer to conduct transactions in their own domestic currency rather than with foreign currencies, fiat currencies of different countries will be imperfect substitutes, allowing their exchange value to be determined by the relative amount of these fiat currencies.

Parts II and III of this volume also have two policy papers that are thought-provoking. The proposal for federal budget reform by Chari and Miller published in 1990 is particularly interesting to read at this juncture when a balanced budget amendment is being debated in the new Republican Congress. Chari and Miller lay out a set of sensible principles that should guide any budget reform. These include the need to express fiscal policy in terms of rules which bind the actions of policymakers and to balance the budget in a present-value sense without use of the inflation tax. In addition, benefits should outweigh costs, users should pay, and there should be tax-smoothing to minimize deadweight loss. These principles lead to accounting rules in which expenditures and receipts are recorded when the activity giving rise to them occurs, the use of separate accounts for operating and capital items, balanced budgets over a two-year horizon for the operating account and an independent debt ceiling for the capital budget. Although political considerations are as important as economic ones for making budget reform work, so that there could be strong disagreements over whether Chari and Miller's proposal would work, I found their analysis clarifies the debate and provides an

excellent jumping off place for thinking about how to reform the budget process.

A case for fixing exchange rates is outlined in Rolnick and Weber's paper. Again this policy piece is thought-provoking, but I have more trouble with its conclusions. They argue for a fixed exchange rate system by pointing out that in the United States we have one that works quite well. Each Federal Reserve Bank issues its own notes which are identified with a district bank name and a district letter symbol. These notes trade at a fixed one-for-one rate, thereby facilitating trade throughout the United States. I do not find this example to be very compelling. As the literature on optimum currency areas indicates, both labor and capital mobility are an essential feature of an optimal currency area. Although labor mobility is very high within the United States, both because of similar language and customs throughout the U.S. as well as a natural high labor mobility of American workers, these conditions do not apply for other agglomerations of countries. Using the U.S. example to justify a worldwide fixed exchange rate regime is therefore unconvincing.

## IV. Real Business Cycle Analysis and Empirical Macroeconomics

The rational expectations manifesto outlined by the Lucas and Sargent paper that opens the Miller volume calls for the creation of equilibrium macroeconomic models that assume agents have rational expectations and act to maximize their private interests in

markets that clear. An outgrowth of this suggestion has been the development of so-called real business cycle models. Parts IV and V of the volume describe real business cycle modeling and empirical macroeconomic analysis based on these models.

The first article in Part IV appropriately begins with the well-known paper, "Theory Ahead of Business Cycle Measurement," published in 1986 by Edward Prescott, a leader in the development of real business cycle models. This paper lays out the basic real business cycle paradigm. It shows that a neoclassical growth model in which there are optimizing economic agents with rational expectations and markets that clear can produce business cycle fluctuations of the type experienced in capitalist economies. These models have two striking implications. First, since they are equilibrium models, real business cycle models have the implications that the kinds of government intervention advocated by Keynesian economists are not welfare improving. Second, they indicate that in the post World War II period, technology shocks, and not monetary shocks, have been the major source of business cycle fluctuations. An important methodological feature of the development of these models is that calibration is used to evaluate them rather than econometric estimation: i.e., rather than fit individual equations of the model to the data with econometric methods, the parameters of the model are chosen from existing microeconomic studies and historical observations of parameters such as the labor share of output. Then the model is simulated and the means and second moments of key variables are compared to the model's simulated values.

The real business cycle literature has exploded since it first appeared with Kydland

and Prescott (1982) and Long and Plosser (1983). However, the real business cycle methodology has not been uncontroversial. Summers fired a serious salvo at this literature in his discussion in this volume of the Prescott paper that opens Part IV. Summers criticizes Prescott's real business cycle analysis on four grounds. He disagrees with Prescott's choice of parameter values, finds no independent corroborating evidence for the existence of the technology shocks that drive the real business cycle model, argues that prices are not explicitly modeled, and maintains that real business cycle models ignore exchange (market) failures as a source of business cycle fluctuations. Prescott's reply to Summers in the following chapter of the volume, and the other papers in Part IV by Kydland and Prescott, Hansen and Wright, and Aiyagari, respond to Summers' criticisms by disagreeing with some of his views on parameter values and by demonstrating how real business cycle models can be modified to fit more realistically the empirical business cycle facts. Part V of the book ends the volume with two studies by Lawrence Christiano that show how the real business cycle paradigm can be used to conduct empirical analysis of issues that are at the core of macroeconomics.

Looking at the real business cycle debate from today's vantage point, where do we stand? Because real business cycle analysis continues to be a very active area of research, there are many different opinions about its value. Therefore, any discussion of where the debate stands will be inherently subjective. Thus, I am forced to rely on my own subjective view, which, however, I believe to be fairly representative of those

in policymaking circles.[3]

The strongest criticism of real business cycle models is one raised in Summers' paper in the Miller volume, that there is no independent corroborating evidence for the large technology shocks necessary to drive the models. As has been pointed out by Calomiris and Hanes (1994) and Stadler (1994), many small innovations that diffuse slowly through the economy cannot produce the cyclical properties required by real business cycle models, and yet analysis by economic historians demonstrates that small innovations that diffuse slowly are exactly how the innovation process takes place. Furthermore, it is also very hard to explain the existence of negative pure technology shocks (i.e., technological regress) that can produce recessions in real business cycle models. It is true that breakdowns in information in financial markets during financial crisis episodes as described in Bernanke (1983) and Mishkin (1991) could lead to something akin to a negative technology shock, but such financial market breakdowns receive their impetus from monetary shocks and thus differ from the technology shocks envisaged by real business cycle theorists.

A second important criticism of real business cycle models and the equilibrium approach to macroeconomic modeling advocated by Lucas and Sargent in the first chapter of the volume is their reliance on the representative-agent paradigm. Although Lucas and Sargent call for business cycle modeling based on micro foundations, to make these

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[3]See Stadler (1994) for an excellent recent survey and critique of real business cycle models.

equilibrium models tractable they assume that all consumers and firms have the same specification for tastes (utility) and technology (production). There are several problems with this representative agent approach.

First, as is well known, it is very hard to aggregate individual consumers and firms with different tastes and technology and obtain a representative agent characterization that can adequately describe aggregate behavior. Thus, although advocates of equilibrium business cycle model claim that they are providing a more rigorous microeconomic foundation for macroeconomics, they may be using a flawed framework that is not providing adequate micro foundations for the study of macroeconomics.

Second, by using a representative agent paradigm, real business cycle theorists are unable to model exchange (market) failures of the type that Summers in his paper in this volume cites as important to understanding business cycles. New Keynesian economists allow for heterogeneity among economic agents and yet still try to provide microeconomic foundations for explaining business cycle fluctuations. This has led to work which sees imperfect competition, externalities, costly price adjustment and information breakdowns as important elements in enabling nominal rather than real shocks to play an important role in producing business cycle fluctuations.

A further criticism of real business cycle modeling is that it abandons an econometric approach to empirical analysis and instead relies on calibration. One advantage of econometric analysis is that it imposes a discipline on the researcher by forcing him or her to ask how statistically likely, given the data, are the parameters

values associated with a theory. A finding that particular parameter values suggested by the theory are highly unlikely given the data suggests that the theory may not be very adequate. Advocates of real business cycle models take the alternative calibration approach of seeing what first and second moments arise from their real business cycles and then comparing them to the first and second moments in the data. When some of these first and second moments do not match the data very well, as is often the case, it is then hard to assess whether the model provides a useful description of reality. Furthermore, when first and second moments do not match the data very well, real business cycle modelers then modify features of the model to match the moments better. This can lead to ever more complicated real business cycle models which match the moments better but which might depart further and further from reality.

The non-econometric approach to real business cycle modeling leads to another danger that is exemplified by the title of Edward Prescott's paper in this volume, "Theory Ahead of Business Cycle Measurement." On page 286 Prescott states, "An important part of this deviation [of the theory from the observations][4] could very well disappear if the economic variables were measured more in conformity with theory. That is why I argue that theory is now ahead of business cycle measurement and theory should be used to obtain better measures of the key economic time series." Although improving measurement by using theory is certainly appropriate, I find Prescott's statement to be

[4]The bracketed phrase has been added for clarification.

very dangerous. It comes close to saying that, if the evidence does not agree with the theory, then the evidence cannot be right. Although this view is rarely made explicit, I think that it is quite prevalent among many economists. This view is inherently unscientific and it has the consequence of allowing some economic theorists to depart further and further from reality, making their analysis irrelevant. This is not an appropriate route for the economics profession to take.

Because of these criticisms, real business cycle models have not been taken very seriously by most practicing macroeconomic policymakers. Instead, policymakers continue to rely on macro models that have a more Keynesian bent. Nonetheless, real business cycle models have had an impact on the way economists think about the relationship between economic growth and business cycles and have caused the economics profession to think harder about how supply shocks play a role in aggregate economic fluctuations.

## V. Was it a Revolution?

One of the enjoyable aspects of reading the Miller volume in its entirety is that being exposed to the range of research stimulated by the rational expectations paradigm makes you sit back and ponder the question of how much of a revolution rational expectations actually produced in macroeconomics.

My view is that it there truly has been a rational expectations revolution. Despite

the criticisms of the equilibrium approach to business cycle modeling, the majority of the currently active researchers in macroeconomics use rational expectations as a starting point in their analysis. For example, the New Keynesian economists, although they disagree with the representative agent and market-clearing elements of the real business cycle paradigm, generally accept the concept of rational expectations and employ it in their models. Furthermore, although New Keynesian economists reject the equilibrium modeling approach, they have responded to the Lucas-Sargent criticism of traditional Keynesian modeling by trying to provide a better microeconomic foundation for Keynesian features of macroeconomic models.[5]

In addition, although most macro policymakers have rejected equilibrium business cycle models for a more Keynesian approach and even continue to use traditional Keynesian macroeconometric models for policy analysis, several of the lessons from the rational expectations revolution are central in their thinking about policymaking. Policymakers now recognize the importance of expectations to the outcomes of particular policies because of the rational expectations revolution: before the advent of rational expectations, expectation issues were typically ignored by policymakers when conducting policy analysis. In addition, although not all policymakers completely accept the rationality of expectations, they have come to recognize the principle raised by rational expectations that expectations formation will change when different policy regimes are

[5]For example, see the papers in Mankiw and Romer (1991).

in place. As a result, the Lucas critique of policy evaluation using Keynesian macroeconometric models does affect the way policymakers make use of these models.

An important implication of rational expectations analysis is that, since the effect of a particular policy depends critically on what economic agents expect this policy to be, there is much less certainty about the effects of any particular policy change. This implication has made policymakers far less likely to advocate activist stabilization policies than they once did.

The rational expectations revolution has also highlighted the importance of credibility to the success of macroeconomic policymaking. Policymakers now recognize that if an anti-inflation policy is not believed by the public, it may be less effective in reducing the inflation rate when it is actually implemented and may lead to a larger loss of output than is necessary. Achieving credibility has thus become an important goal for policymakers. This has caused them to recognize that they must be consistent in their actions in order to achieve credibility.

The rational expectations literature on the time-inconsistency problem for policy has also had a major impact on policymaking. Policymakers and even politicians now recognize that binding constraints which alleviate the time-inconsistency problem may be desirable. As a result, politicians and policymakers have become less likely to advocate discretionary policy and are more willing to design policymaking institutions that are likely to take a long rather than a short-run view, thereby avoiding myopic policies that produce undesirable outcomes.

The title of the Miller book is quite correct to describe the research contained in it as the rational expectations revolution. Macroeconomics and policymaking will never be same because of this research.

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