Robert Barro 2002 Nothing is Sacred: Economic Ideas for the New Millennium. MIT Press, pp. 26-32

Bob Lucas and Rational Expectations

I was thrilled when Bob Lucas, my former colleague at the University of Chicago, was awarded the Nobel Prize in October 1995. Although it was 6:30 in the morning, Chicago time, I immediately called his home number. But, unfortunately, I reached his ex-wife, Rita (the number in my phone book dated back to my time together with Bob in Chicago in 1984). Apparently, I had woken Rita, but she recovered quickly to ask why I was calling Bob so early in the morning. I was worried that she would react negatively to the news of Bob's prize, but I told her anyway that I was calling to congratulate him on his award. Much to my surprise, Rita became very pleased and excited. Her first question was, however, even more surprising: "Did he get the prize by himself or with someone else?" When I said "by himself," Rita reacted with even more excitement.

I learned the next day that Rita's divorce agreement with Bob stipulated that she would receive half of any Nobel Prize that he won by 1995. Thus, I had unknowingly informed Rita the previous morning that she was richer by half a million dollars. Moreover, she had received this windfall at the last possible moment. No wonder she was so pleased, and no wonder she was so interested in whether the prize had been individual or joint. Fortunately, Bob was not annoyed with me about my inadvertent call to Rita, and his gracious comment to the press about his divorce agreement was, "A deal's a deal."

When I was on the economics faculty in Chicago, I had a sign in my office that said, "No smoking, except for Bob Lucas." It was worth enduring the smoke to talk to Bob but not to any other economist-smoker. This behavior accorded with my view that his selection for a Nobel Prize was a great idea, one that had been anticipated by most economists for several years.

Bob's contributions to macroeconomics in the 1970s permanently changed the very center of the discipline. Moreover, his influence has been as great on his critics, primarily Keynesians, as on his supporters, who tend to represent market-clearing or equilibrium-style approaches.

In some key articles published from 1972 to 1975, Bob applied John Muth's insights on rational expectations to monetary theories of the business cycle. Previous analyses had relied on simplistic Phillips curve models in which increased inflation led mechanically to lower unemployment and higher economic growth. But these theories assumed that workers and firms did not exploit readily available information and, hence, would commit the same mistakes time after time. For instance, higher inflation was assumed to raise workers' willingness to work because they were continually fooled into believing that their wages were worth more than they really were.

In Bob's theory, where expectations are formed rationally, people can be confused temporarily by monetary surprises. (Rational expectations are not the same as complete information or perfect foresight.) In particular, an unanticipated expansion of money and the general price level may temporarily fool workers into thinking that their wages had risen in real terms. Similarly, producers might believe that the prices of the goods they were selling had risen *relative* to the prices of other goods. Through these channels, a monetary stimulus might cause a temporary boom, but one that must end soon after the errors in expectations were recognized.

In the older-style theory, the permanent trade-off between inflation and unemployment meant that the monetary authority had a key role in fine-tuning the economy. The revised theory has dramatically different implications because monetary policy has its main influence when it is surprising. Thus, it is not enough to print more money when the economy is contracting and to print less when the economy is expanding. The expectations of this policy pretty much neutralize the real effects, a result that was demonstrated in 1975 in a major article by Tom Sargent and Neil Wallace.[14]

Unfortunately, the easiest way for a monetary authority to create surprises is to behave erratically, a policy that has effects that are real but harmful. Therefore, an important inference from Lucas's theory is that the central bank ought to relinquish the idea of fine-tuning and instead concentrate on the long-term objective of low and stable inflation. The Federal Reserve and other major

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14. Thomas J. Sargent and Neil Wallace, "Rational Expectations, the Optimal Monetary Instrument, and the Optional Money Supply Rule," *Journal of Political Economy*, 83, April 1975, 241–254.

central banks had pretty much adopted this goal by the early 1990s, and this shift in policy has been highly successful.

As an aside, Bob's first theoretical paper on rational expectations, "Expectations and the Neutrality of Money," appeared in 1972 in a specialized publication, *The Journal of Economic Theory*. He had submitted this work to the American Economic Association's main journal, *The American Economic Review*, but it was rejected on the grounds of being too mathematical. In response, Bob expressed outrage and accused the editor of trying to run *Newsweek*. All of this was confirmed by the unfortunate editor, who asked me what I would have done in his position. My reply was that I would have accepted the paper at once.

The role of expectations is not limited to monetary policy but is crucial in many areas of economics, as Bob showed in his later research on investment, unemployment, taxation, public debt management, and asset pricing. In all of these situations, the appropriate evaluation of policy takes account of the way that expectations would be rationally formed. The older analyses, which failed to consider this adjustment of expectations, are now described as failing the "Lucas critique."

In the case of the Phillips curve, the critique means that the monetary authority cannot decide to expand money and prices during recessions and just assume that inflationary expectations will remain the same. Similarly, policies on taxation, transfers, and regulation will typically be anticipated and will therefore affect behavior. Such notions are commonplace in theories of corporate finance. No self-respecting finance economist would ever think that the government could change a policy that has an impact on financial markets, such as a tax on capital income or a charge on transactions, without affecting the way that assets are priced.

Aside from criticizing older methods of evaluating macroeconomic policy, Lucas showed how to develop models that encompassed the rational formation of expectations. These models are now used regularly by macroeconomists to assess alternative policies. Much of this research, now called real business cycle theory, has downplayed monetary factors and has focused instead on forces such as shifting technologies, changing patterns of international trade, and the government's fiscal and regulatory interventions. This emphasis on real forces also appears in recent research on the determinants of long-term economic growth, another area to which Lucas made major contributions.

Lucas likes to view his contributions not so much in terms of their implications for specific controversies in macroeconomics—the Phillips curve, the effectiveness of monetary policy, the validity of Keynesian models—but rather as part of an evolving methodology for the whole field of economics. He says in his *Models of Business Cycles:* "Dynamic economic theory . . . has simply been reinvented in the last 40 years. It is now entirely routine to analyze economic decision-makers as operating through time in a complex, probabilistic environment. . . . What people refer to as the 'rational expectations revolution' in macroeconomics is mainly the manifestation, in one field of application, of a development that is affecting all fields of application. To try to understand and explain these events as though they were primarily a reaction to Keynes and Keynesianism is futile."[15] Thus, for Lucas, a useful approach to macroeconomics involves the same economic modeling that would apply to corporate and public finance, industrial organization, and so on.

In the late 1970s, soon after I left Chicago (the first time in 1975), I invited Bob to present a paper to a seminar on macroeconomics that I was running at the University of Rochester. He was supposed to arrive the previous day, but I got a call from him that night. He had gone to O'Hare Airport in Chicago to catch his flight to Rochester, but he learned at the airport that the smoking section of the plane was already filled, so he went home. I tried to contain my anxiety while remembering all the people who were eagerly anticipating his seminar the next day, so I gently inquired whether he might be able to catch a plane in the morning. He said that he had already explored that possibility but that the only smoking seats available were in first class. I said that first class would be fine, and Bob came and gave a great seminar. Actually, I would have been happy to pay much more

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

than the extra airfare. (It is fortunate, with the abolition of smoking on airplanes, that Bob is now a nonsmoker.)