

NOTES ON THE CURRENT STATE OF EMPIRICAL MACROECONOMICS*

As I see it, the major distinguishing feature of macroeconomics is its concern with fluctuations in real output and unemployment. The two burning questions of macroeconomics are: Why does the economy undergo recessions and booms? What effect does conscious government policy have in offsetting these fluctuations? These questions define the issues considered here. I will further restrict my attention to structural approaches, and will avoid discussion of the reduced-form approach, including its recent sophisticated manifestation (7).

As a gross oversimplification, current thought can be divided into two schools. The fresh water view holds that fluctuations are largely attributable to supply shifts and that the government is essentially incapable of affecting the level of economic activity. The salt water view holds shifts in demand responsible for fluctuations and thinks government policies (at least monetary policy) is capable of affecting demand. Needless to say, individual contributors vary across a spectrum of salinity.¹ The old division between monetarists and Keynesians is no longer relevant, as an important element of fresh-water doctrine is the proposition that monetary policy has no real effect. What used to be the standard monetarist view is now middle-of-the-road, and is widely represented, for example, in Cambridge, Massachusetts.

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¹To take a few examples, Sargent corresponds to distilled water, Lucas to Lake Michigan, Feldstein to the Charles River above the dam, Modigliani to the Charles below the dam, and Okun to the Salton Sea.

The New Classical Macroeconomics

Empirically, research based on the fresh water view is dominated by the work of Thomas Sargent. Here I will concentrate on his recent "Classical Macroeconometric Model for the United States."² By classical, Sargent does not mean the view attacked by Keynes that real fluctuations are impossible in a market economy. Quite the contrary, it is clear from the structure of his model that its simulations will generate fluctuations in unemployment and real GNP that closely resemble actual data. Sargent relies on two mechanisms to generate realistic fluctuations. First, he accepts the "Phelps volume" theory of the negative relation between unemployment and unexpected inflation. He puts unemployment on the left and inflation on the right, but his empirical results confirm a hundred other studies of the Phillips curve with the variables reversed--there is a definite negative relationship. Second, he makes the equilibrium unemployment rate (the rate corresponding to no unexpected change in prices) obey a stochastic process that generates realistic fluctuations. Its roots are $.74 \pm .221$. Now it turns out that the overwhelming fraction of the explanation of unemployment in this equation is attributable to the second, equilibrium term.³ The empirical importance of disequilibrium unemployment (in the sense of the Phelps volume) is minimal. Most inflation is expected, and a large amount of unexpected inflation generates a small amount of disequilibrium unemployment (1 percentage point of unexpected inflation yields about 0.3 percentage points less unemployment, according to Sargent's

²See the list of suggested reading at the end of these notes.

³See Hall, "Persistence of Unemployment," pp. 311-314. Sargent informs me that my results have been cited as showing that rational expectations as embodied in his unemployment equation is factually incorrect, whereas I tried to say only that fluctuations in unemployment are largely fluctuations in the equilibrium rate. Sargent and I plan a joint paper to try to clarify exactly what are the lessons of the high serial correlation of unemployment.

results).

The crux of Sargent's explanation of real fluctuations, then, is his stochastic process for the equilibrium unemployment rate. Further, his conclusions about the inefficacy of monetary policy depend crucially on his hypothesis that policy does not shift the equilibrium unemployment rate. His tests of this hypothesis (which he calls the "strict natural rate hypothesis") are not entirely convincing. One of the simplest is based on inserting lagged money supply on the right-hand side of the unemployment equation. Since this variable is known when expectations are formed, it cannot influence the disequilibrium term, so any influence it has operates through the equilibrium unemployment rate. The hypothesis of no effect is rejected at the .05 level but not at the .01 level. Other tests are less clear, possibly because they have lower statistical power. I see the empirical support for Sargent's extreme fresh-water position as fairly weak at this stage, but much more work along his lines is needed.

How might yesterday's monetary policy affect today's real output? A recent theoretical paper by Robert Lucas (6) makes two suggestions. First, the period over which disequilibrium effects can occur is not arbitrary, but is related to the speed of diffusion of information.⁴ Sargent finds a large effect of the money supply 5 quarters earlier on today's unemployment.

If participants in the labor market can remain unaware of developments that occurred 15 months earlier, then the Phelps volume theory can explain a large part of the behavior of unemployment, and Sargent's equations and tests need reformulation. My own view is that the hypothesis that Lucas and Sims favor--extremely slow diffusion of information--strains credulity.

⁴See Christopher Sims's discussion of my paper (3), pp. 336-7, and my reply, pp. 344-5.

Sargent seems on the right track in limiting the information lag to 3 months.

Lucas also suggests that effects working through the capital stock can further explain persistent fluctuations in real output (but not in unemployment). Neither Sargent's model nor empirical Keynesian models keep track of the role of capital in aggregate supply. The model in (4) attempts to do this in a theoretically defensible way, and results not given in the paper suggest that Lucas is quite right. Again, this does not explain the persistence of unemployment.

Macroeconomists of more brackish persuasions are skeptical of the explanatory value of information lags, and have developed a major alternative within the framework of rational economic behavior. The basic idea is that buyers and sellers of labor services rationally enter into contracts that fix the wage in money terms for some time into the future.⁵ The precise reasons for this are still a matter of dispute and investigation, but the macroeconomic implications are clear. In (4) I have attempted (for the first time, as far as I know) to build this consideration into an empirical aggregate supply function. The result is not too different from the standard modern Phillips curve. Aggregate supply is highly price-elastic in the short run, when the money wage is predetermined, but becomes less price-elastic in the medium run, where wage contracts can respond fully to unexpected changes in demand. Empirical research on wage contracts is just beginning.

The view that contractual wages have an important role in explaining fluctuations in unemployment has been strengthened by Martin Feldstein's finding that the bulk of cyclical changes in unemployment are not the result of job loss, but of temporary layoff from permanent jobs ("The Importance of

⁵See footnote 0 in (4) for a bibliography.

Temporary Layoffs: An Empirical Analysis"). It is hard to make sense of temporary layoffs except under the hypothesis of contractual wages.

Expectations

By now, everyone more than a few yards from the ocean's edge bows in the direction of rational expectations. To many, this simply means that the equations for explaining expectations are more elaborate distributed lags. The most recent version of the MPS model is full of lags, and as far as I know, they all arise from models of expectations. Two influences have pushed model-builders away from this approach to expectations. First, an influential paper by Robert Lucas, "Econometric Policy Evaluation: A Critique," showed that as a matter of theory, distributed lags are rational given a particular policy rule and stable stochastic influences elsewhere in the economy, but that the form of the lag is changed when policy changes. Second, the importance of Lucas's point was driven home by economic events that occurred just after he wrote the paper. It is now very clear that the inflation of 1973-74 has much less effect on inflationary expectations than would be predicted by a distributed lag model. Economic agents did not treat the oil price increase as just another drawing from a fixed distribution of inflationary shocks. Rather, it appears to have been treated as a one-time increase in the price level. The suggestion emerges that people are thoughtful in forming expectations and react differently to different events, even when they have the same observed impact on historical data.

An approach to expectations that seems to give unexpectedly reasonable results is to posit that expectations are formed by consulting the econometrician's model. The result is a model entirely free from the distributed lags so forcefully criticized by Lucas. My own approach along these lines

contains the following expectations:

1. In the labor market, future wages are set on the basis of future demand.
2. Firms invest on the basis of future demand.⁶
3. The gap between nominal and real interest rates is the actual rate of increase of next year's price level relative to this year's.
4. Consumers determine permanent income on the basis of the future stream of income.

The model is extremely stable, in contrast to the wildly unstable behavior of models with adaptive expectations. Of course, the structure of the model is subject to the criticism that it attributes a high degree of sophistication to economic agents.⁷ On the other hand, the actual values of the expectations, namely the model's forecasts, are perfectly reasonable.

Keynesian Rebuttal?

So far as I know, there has not been a major defense of traditional Keynesian thinking against the fresh-water attack. The BPEA, for example, has not published a paper claiming the effectiveness of fiscal policy since Okun's defense of the tax surcharge of 1968, which dealt only with the permanent-transitory issue. James Tobin's presidential address contained a thorough criticism of the Phelps-volume theory of the Phillips curve, but relatively little fresh-water macroeconomics now rests on that theory.

⁶This is a matter of personal interest, since Lucas correctly takes my work with Jorgenson on investment to task for failing to handle expectations correctly

⁷Equal to that of an MIT Ph.D. in economics with 9 years of professional experience.

SUGGESTED READING
(in approximate order of importance)

- (1) Robert E. Lucas, Jr., "Econometric Policy Evaluation: A Critique,"
in Brunner and Meltzer (eds.), THE PHILLIPS CURVE AND LABOR MARKETS.
Amsterdam: North-Holland, 1976.
- (2) Thomas J. Sargent, "A Classical Macroeconometric Model for the United
States," JOURNAL OF POLITICAL ECONOMY 84 (April 1976), 207-38.
- (3) Robert E. Hall, "The Rigidity of Wages and the Persistence of Unemployment,"
BROOKINGS PAPERS ON ECONOMIC ACTIVITY, 1975:2, 301-19 only.
- (4) _____, "The Macroeconomic Impact of Changes in Income Taxes in
the Short and Medium Runs," presented to the NBER-NSF Conference on
Research in Taxation, Stanford, January 1976 (proceedings forthcoming,
JOURNAL OF POLITICAL ECONOMY).
- (5) Martin S. Feldstein, "The Importance of Temporary Layoffs: An Empirical
Analysis," BROOKINGS PAPERS ON ECONOMIC ACTIVITY, 1975:3, 725-44.

REFERENCES

- (6) Robert E. Lucas, Jr., "An Equilibrium Model of the Business Cycle,"
JOURNAL OF POLITICAL ECONOMY 83 (December 1975), 1113-1144.
- (7) Thomas J. Sargent and Christopher A. Sims, "Business Cycle Modeling
without Pretending to Have Too Much a Priori Economic Theory,"
presented to the seminar on New Methods in Business Cycle Research,
Federal Reserve Bank of Minneapolis, November 13-14, 1975.