Discussion

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In an important series of papers, now dating over more than a quarter-century, Christopher Sims has added to our understanding of U.S. macroeconomic behavior in general and the influence on macroeconomic activity of U.S. monetary policy in particular. The contribution made by these papers lies both in their specific empirical findings and in the methodologies they have developed, which other researchers (here I include myself) have widely adopted for their own purposes. Sims's paper in this volume nicely extends this line of work: Its methodology appears to be of broad applicability. The empirical results it presents are striking, indeed startling. And as is so often the case in Sims's papers, side comments scattered throughout the paper (including the footnotes) offer nuggets of wisdom on the epistemology of economics.

That said, I am skeptical that the current paper delivers on its objective of clarifying the role played by Federal Reserve policy in either causing or cushioning U.S. business cycles. Sims's main conclusion here is that monetary policy is pretty much irrelevant to fluctuations in macroeconomic activity: that the departures from regular policy behavior that have occurred historically have had only small consequences and, further, that substituting one pattern of regular behavior for another would not have made much difference. If the model he presents has succeeded in identifying Federal Reserve actions and measuring their economic effects, these findings should force us to reconsider many aspects of economics and economic policy.

The title of this conference is "Beyond Shocks." The methodology that Sims deploys in his paper honors the obvious intent of this title, in

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that it goes beyond the conventional practice of most vector autoregression analyses applied to monetary policy (which in turn resonates all too well with the theoretical presumptions of modern rational expectations macroeconomics), which is to ignore the regular, systematic behavior of monetary policy and focus only on the "shocks" corresponding to irregular, nonsystematic central bank actions. Yes, Sims does examine here the historical sequence of monetary policy shocks that his model implies, and yes, he investigates how both real economic activity and prices respond to those policy shocks. But he also focuses on the way in which monetary policy has systematically tightened in response to real economic strength and inflation, or, alternatively, eased in response to economic weakness. And he tries to pin down the effects of this systematic policy behavior by asking what difference it would have made, for real output, prices, and so on, if one kind of systematic monetary policy had been substituted for another.

While I therefore applaud this aspect of Sims's methodology, in the end it is precisely this feature of his work here that, if correct, proves subversive of so much of what we think we know about economics in general and monetary policy in particular. Specifically, Sims estimates two different representations of systematic monetary policy behavior: one describing the postwar period (1948 to 1997) and the other describing the interwar period (1919 to 1939). The two clearly differ. But the heart of his conclusion that monetary policy does not much matter for business cycles is his finding that, to a first approximation, the Great Depression of the 1930s would still have occurred, even if the Federal Reserve in the interwar years had instead followed the far more proactive monetary policy it adopted after World War II (and, according to Sims, has pursued ever since). See in particular Sims's key Figure 5.

In light of the focus of this conference on business cycles, in the standard sense of fluctuations in production and employment, this emphasis on whether a different monetary policy could have prevented or at least cushioned the Great Depression is appropriate. But Sims also applies his methodology in the opposite direction—that is, looking to see what the *postwar* period would have been like if the Federal Reserve had simply carried on, for another half-century, under the same monetary policy as in the 1920s and 1930s. And here, unlike in his analysis of the Depression, Sims's model produces findings that practically every economist—and plenty of other readers too—will find deeply problematic.

As in much of the industrialized world, a major feature of the post-World War II experience in the United States has been the sustained rise in prices. Before World War II, prices sometimes rose but also sometimes fell, with no discernible trend over long periods of time. U.S. prices on the eve of World War II were, on average, approximately the same as on the eve of the Civil War (or, for that matter, the eve of the American Revolution, to the extent that the vast differences in economic

circumstances admit direct comparisons). By contrast, prices have risen almost continuously since 1945. Over the past half century the American economy has, in effect, added a zero to the average price. The first-class letter that cost 3 cents in the early postwar years now costs over 30 cents.

Sims's most striking finding, I believe, is not that monetary policy had little to do with the interwar Depression but that it had little to do with the postwar inflation. During the interwar period prices fell dramatically. (See Sims's Figure 6.) Yet according to Sims, if the Federal Reserve in the postwar period had followed the same systematic monetary policy that delivered that interwar *de*flation, the postwar result would still have been the historically unprecedented phenomenon of a half century of sustained *in*flation. (See Sims's Figure 13.) One does not have to be a believer in the claim that "Money is everywhere and always a monetary phenomenon," or similarly misleading overstatements, to think that over periods as long as 20 years in one case and 50 years in the other, the trend rate of rise or fall of the price level is importantly influenced by monetary policy. Here it simply is not.

The most probable reason, I believe, is that Sims's model has not adequately identified the Federal Reserve's monetary policy actions, or their macroeconomic effects, or perhaps neither. If that is so, however, then the model's implied irrelevance of monetary policy for inflation is not all that is problematic. The implied irrelevance for business cycles, including not only questions about the Great Depression but also whether monetary policy has played a major role in either causing or cushioning the business recessions our economy has experienced in the postwar period, is invalid as well.

A close reading of the paper suggests that Sims is aware of these problems too. His reference to potentially important effects of "nonmonetary" aspects of central bank policy—for example, whether or not it is standard practice to rescue illiquid and/or insolvent banks, whether bank depositors are insured against whatever failures do occur, and so on—is a clear recognition that something of consequence may happen in the economy but not in his model. But even apart from such supernumerary aspects of central bank policy, it is also entirely possible that the model's estimated "policy" equation, relating the discount rate to output, prices, and money, does not adequately capture how monetary policy has historically behaved. (For example, the rule of thumb that John Taylor has proposed to describe Federal Reserve behavior during the Greenspan years would imply interest rates in the Depression an order of magnitude more negative than what Sims reports in his Figure 4 from applying to the Depression the rule that he estimates to represent the postwar period.) Correspondingly, it is also possible that the model's equations relating output and prices to the discount rate are likewise underestimates.

One straightforward way to check out this possibility would be to solve the model backward, to see what pattern of interest rates (since that

is how Sims characterizes monetary policy) would have been necessary to achieve a given clearly counterfactual outcome. Most obviously, what pattern of interest rates does the model say the Federal Reserve would have to have implemented in order to hold prices (and, indirectly, money) to a flat rather than rising trend over the postwar period? Is this implied interest rate trajectory plausible? If so, then maybe the model is correct after all, and the Federal Reserve could have adopted a slightly different but nonetheless noninflationary monetary policy but just did not do so. But if the implied noninflationary interest rates are implausible, then instead of believing that a noninflationary policy path was somehow impossible in the postwar period, I would instead conclude that the model misrepresents monetary policy, or its effects, or both. (Carrying out an equivalent exercise for the interwar period, asking what monetary policy would have prevented the Depression, is less straightforward because even in Sims's own interwar simulations, the zero minimum on nominal interest rates is a problem. As he suggests, direct intervention to prevent bank failures, and other policy actions also not modeled at all here, would presumably have been necessary to arrest the early 1930s decline in real activity levels.)

I will conclude with a few shorter remarks about aspects of Sims's paper that also bear comment but are less central to his principal mission. First, Sims's treatment of systematic Federal Reserve policy in the postwar period as having followed one unchanging pattern throughout seems to me highly dubious. Are we really to equate Paul Volcker's tough stance against inflation with the see-no-evil regime of Arthur Burns? Or to think of Alan Greenspan as simply the reincarnation of G. William Miller? Sims does test for a shift in systematic monetary policy, at July 1979 (why not October?), but he does so by asking whether all 279 of his model's estimated parameters, from all six equations, remain unchanged. I did not understand why he did not focus his test more narrowly on the parameters of the one equation that he takes to represent monetary policy. After all, when he uses his model to investigate the effect of substituting one systematic monetary policy for another, it is only that one equation that he changes.

Second, Sims's appeal to the "fiscal theory of the price level" seems to me very much a red herring in the context of this paper. As recent papers by Michael Woodford and Willem Buiter help to make clear, the so-called fiscal theory of the price level amounts to invoking one pathology to rectify the problems created by another. In particular, as Bennett McCallum's work nicely demonstrated some time ago, when the central bank engages in a "pure interest rate peg" (like what the Federal Reserve was forced to follow in the early postwar years, before the 1951 Treasury–Federal Reserve Accord), the absence of any nominal anchor to monetary policy means that the price level is, in principle, undetermined. In practical terms, over time prices could do anything. The fiscal theory

of the price level amounts to positing that the government can follow what is normally an infeasible budget trajectory (Woodford calls this a "non-Ricardian" trajectory), which somehow violates the usual intertemporal constraint requiring the government to raise taxes in the future to either service or pay off its debt outstanding as of any given time. As Woodford and others have shown, under the right conditions one consequence of this infeasible budget trajectory is to restore the determinacy of the price level, which the central bank had given up by pegging a nominal interest rate.

The opening that Sims exploits to introduce this bizarre confluence of pathologies here is the zero minimum on nominal interest rates: Once easy monetary policy pushes the short-term interest rate to zero, and keeps it there, the central bank has backed into a pure interest rate peg. Hence the price level becomes indeterminate. But once the interest rate on Treasury obligations is zero, in principle the government can sell whatever amount of securities it chooses without having to worry about needing tax revenues later on to service the (zero) interest payments as they come due, and a "non-Ricardian" fiscal trajectory, which is normally nonfeasible, becomes feasible in this case. Hence fiscal policy restores price determinacy.

A problem in all this, of course, is that once the Treasury starts selling securities in volume, the required interest rate will rise above zero unless the central bank buys them in—in which case we are back to the usual case of printing money. Moreover, as Sims points out, even during the Depression the interest rate on longer-term Treasury debt never came close to zero anyway. (A related issue is that I did not understand Sims's statement that the central bank's ability to carry out its lender-of-last-resort function depends on its access to direct budgetary support from the government. I agree that what is involved in acting as a lender of last resort is, ultimately, command over resources. But so long as the central bank can print money—in other words, create reserves on its own books—I do not see why direct support from the government's budget is necessary.)

Finally, Sims's nicely articulated rejection of what he calls the third version of the Lucas critique (including not only the discussion in his section "What About the Lucas Critique?" but also his well-put footnote 10) should be required reading for all students of macroeconomics. So should the philosophy he advances, in the first part of his paper, on the all-important subject of individual maximization. It is, in fact, far more subversive of currently fashionable practice than he lets on. Here, as in so much else, I say more power to him.