None of the papers in the JEP’s symposium on “Computational Experiments in Macroeconomics” (Winter 1996) refers to Eugen Slutsky. Yet Slutsky’s celebrated paper on “The Summation of Random Causes as the Source of Cyclic Processes” (published in Russian in 1927, in English, in a revised version, in Econometrica in 1937) is directly relevant to the interpretation of Kydland and Prescott’s sophisticated computational experiments.

“Almost all the phenomena of economic life,” wrote Slutsky (1927 [1937]) “like many other processes, social, meteorological, and others, occur in sequences of rising and falling movements, like waves. … The presence of waves of definite orders, the long waves embracing decades, shorter cycles from approximately five to ten years in length, and finally the very short waves, will always remain a fact begging for explanation. The approximate regularity of the periods is sometimes so distinctly apparent that it, also, cannot be passed by without notice. Thus, in short, the undulatory character of the processes and the approximate regularity of the waves are the two facts for which we shall try to find a possible source in random causes combining themselves in their common effect” (pp. 105, 107, italics in original).

Later, as a tentative and hypothetical summary of his observations: “The summation of random causes generates a cyclical series which tends to imitate for a number of cycles a harmonic series of a relatively small number of sine curves. After a more or less considerable number of periods every regime becomes disarranged, the transition to another regime occurring sometimes rather gradually, sometimes more or less abruptly, around certain critical points” (p. 123, italics in original).

As an example of the relevance of his findings to economic phenomena, Slutsky presented a figure that plotted a segment of one of his random series subjected to successive summations (his version of Kydland and Prescott’s “calibration”) against an index of British cyclical fluctuations. The correspondence was remarkable.

In explaining their approach, Finn Kydland and Edward Prescott (“The Computation Experiment: An Econometric Tool,” Winter 1996, pp. 69–85) write: “[M]odern business cycle models are stochastic versions of neoclassical growth theory. And the fact that business cycle models do produce normal-looking fluctuations adds dramatically to our confidence in the neoclassical growth model” (p. 72), which they use as the basis for their stochastic general equilibrium model.

As evidence that their results can mimic cyclical fluctuations they note that, in one experiment, “the model economy displays business cycle fluctuations 70 percent as large as did the U.S. economy.” In other experiments, the corresponding estimate is 55 percent, 90 percent and 70 percent. They apparently regard such calculations as evidence that the model economy not only can mimic a major fraction of that feature of the actual economy, but that it does explain that fraction of that feature. They imply that such calculations demonstrate that technological shocks
do explain a large fraction of actual fluctuations and that their model economy is a reliable guide to other features of the business cycle.

That argument is completely unpersuasive. There is a world of difference between mimicking and explaining, between “can or may” and “does.” The relevant test of “does” is whether they can use their model economy to predict actual business cycle behavior not used in constructing their model. As they themselves put it (p. 83), “Perhaps the ultimate test of a theory is whether its predictions are confirmed—that is, did the actual economy behave as predicted by the model economy, given the policy rule selected?” (Why “perhaps”? Is there some other test?) So far as I know, they have not even attempted to meet such a test. Both Hansen and Heckman and Sims embody this point in their more extensive and detailed critiques in the symposium.

Slutsky’s properly calibrated summation of a random series not only can account for essentially the whole of the British fluctuations he mimicked, but also can mimic closely their temporal movements. May it not be that Kydland and Prescott’s computational experiment is simply a special and less dramatic illustration of Slutsky’s conclusion? We can interpret deviations from an aggregate production function as the counterpart of Slutsky’s random series (which was based on numbers drawn in a lottery) and the general equilibrium model into which these deviations were fed as the equivalent of Slutsky’s successive summations of his random series. On what basis is that interpretation less persuasive than Kydland and Prescott’s own interpretation of their results?

References


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