

Econometric models and the monetary policy process

A comment

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This paper gives an excellent overview of the way that econometric models are used to help formulate monetary policy at the Federal Reserve Board. David Reifschneider, David Stockman, and David Wilcox stress at the start of their paper that econometric models are used to help the staff of the Fed “support the monetary policymaking endeavors” of the Federal Open Market Committee (FOMC) rather than make recommendations to the FOMC. In practice I think it is harder than the authors suggest to distinguish “giving support” from “making recommendations.” But regardless of how one characterizes the staff/FOMC interaction at the Fed, the paper clearly demonstrates that econometric models are now a remarkably large part of the policymaking process. Econometric modeling is apparently an indispensable part of FOMC decision-making. Given this importance of models to the FOMC, this paper is especially welcome because it makes the monetary process more transparent.

An important theme that emerges from the paper is that there is a wide variety of applications of a wide variety of econometric models at the Fed. In my comments I would like to focus on (1) the major paradigm shift in econometric modeling at the Fed in the last several years, (2) the general theoretical and econometric features of the main structural models now in use at the Fed, (3) the treatment of money and credit in these models, and (4) the significance of policy rules as part of the policy-evaluation process.

A paradigm shift

The paper discusses the major recent revision of the large-scale econometric models used at the Fed. In particular the U.S. econometric model (MPS) has been replaced as of 1996 by the new FRB/US model and the multicountry model (MCM) has been replaced by the new FRB/MCM model. The MPS model was originally introduced at the Fed in the 1960s. This is the

first major change since the MPS model was introduced. (When these two models—FRB/US and FRB/MCM—are combined and linked, the resulting model is called the World model.)

From a policy evaluation perspective, a fundamental difference between the old models and the new models is the rational expectations assumption. In my view this change in assumption is significant enough to be called a paradigm shift. As the paper notes in several places, the rational expectations assumption makes an enormous difference for policy analysis. Questions can be considered which “did not arise in the context of the older models because expectations were adaptive.” One can look at the effects of a multi-year deficit reduction plan, for example, or a plan for disinflation, and properly deal with the expectational elements of such plans. The rational expectations assumption serves as a baseline; if one feels there is a slow adjustment due to learning, then one can build that learning in relative to the baseline.

The rational expectations assumption also tends to change the way that policy is evaluated. For example, if people are forward-looking, then the effects of a change in policy depend in part on people’s expectations of that policy in the future. To evaluate policy in this situation, one must describe what will happen to policy in different circumstances in the future. In other words, one needs to look at policy more as a contingency plan or a policy rule than a one-time change in the instruments of policy.

The rational expectations assumption also affects how one does forecasting. However, my understanding from the paper is that the rational expectations are not put in the model for forecasting yet. Rather, expectations are generated by a reduced-form vector autoregressive model when the model is used for forecasting.

These new models are an outgrowth of the rational expectations revolution in academia in the 1970s much as the earlier Keynesian models, such as the MPS model, were an outgrowth of the Keynesian revolution in academia in the 1930s. It is interesting that the lag from revolution to model was about the same in both cases.

Characteristics of the models

The assumption of rational expectations changes the methods of policy evaluation regardless of which model one uses. But there are many different rational expectations models. The models differ mainly in how they treat the short-run impact of monetary policy on the economy. Examples include: (1) new classical models with imperfect information; (2) rational expectations models with wage and price rigidities; and (3) real business-cycle models with no role for monetary policy. The new models developed at the Fed are the second type, specifically using some type of staggered wage or price-setting

assumption for the wage or price rigidities. Of these three types of rational expectations models, this seems like the best choice for monetary policy evaluation at this time because of the theoretical plausibility and empirical accuracy of the wage- and price-setting assumption. However, work done at the board by Jeffrey Fuhrer and George Moore has shown the sensitivity of the dynamic properties of the model to changes in the assumptions, so more research would be very useful. The recent work by McCallum and Nelson, Rotemberg and Woodford, and Chari, Kehoe, and McGrattan, which places wage and price rigidities into an otherwise real business-cycle model, might prove to be the prototype of the next generation of estimated econometric models suitable for policy analysis at the Fed in the future.

Another characteristic of the new models at the Fed is a heavy reliance on the “polynomial adjustment cost” framework to describe the behavior of the models out of equilibrium. I find the equations based on these adjustment costs difficult to interpret because there is little microeconomic justification. Large models are difficult enough to interpret without the addition of multivariate adjustment cost models with little rationale. A possible research strategy as the new models develop would be to gradually reduce the reliance on these polynomial adjustment costs and to replace them with other equations such as time to build, gestation lags, or utility functions with non-separable preferences.

The treatment of money and credit

Two interesting aspects of the way that the new models at the Federal Reserve treat money and credit are revealed in the paper. First, there is a complete absence of money-supply and money-demand equations. Second, the credit crunch of the late 1980s and the early 1990s, which had an effect on policy as discussed in the paper, had little influence on the structure of the models used at the Fed. Interest rates are determined by policy rules, and the impact of money on the economy works mostly through financial market prices—long-term interest rates, exchange rates, and other asset prices.

Although the usefulness of the monetary aggregates has been reduced by improvements in financial technology and by measurement difficulties, I think it is a mistake not to have a fully developed money-supply and demand sector running parallel with the interest-rate-setting equations in the models. The monetary aggregates may improve in the future and, in the meantime a period of deflation, as in Japan, or a return to high inflation could cause errors with nominal interest-rate-setting procedures. Having a money-supply and money-demand sector could prove to be a useful backup.

I think the absence of a credit channel in the structure of the models, despite the U.S. experience of 1989-91, reflects the fact that credit measures

have proven to be less reliable for structural empirical models than the money aggregates.

Policy rules

The paper makes clear that there is a substantial amount of research on monetary policy rules at the Federal Reserve Board. This is a relatively new development and is closely related to the incorporation of rational expectations into the models. In addition, several current and recent members of the FOMC—Janet Yellen, Alan Blinder, and Lawrence Meyer—have expressed interest in the staff doing research on policy rules. There also seems to be a general view at the Fed that such research is useful even in a discretionary policy-making environment.

I found the reported work on assessing the appropriate size of the reaction coefficients in an interest-rate rule to be particularly interesting. The simulations of the FRB/US model indicate that the size of the coefficient on output should be higher than I have suggested. I think that additional research on this question would be useful, especially as the FOMC decides how much to raise interest rates as the economy gains strength and pushes its capacity limits.