Estimating Central Bank Reaction Functions Subject to the Restriction that the Central Bank Minimizes Expected Policy Loss

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January 31, 2008

In this talk I will discuss and provide selected results from a research program that uses inverse control techniques to infer the parameters of a central bank loss function. The key idea of the program is that the assumption that a central bank maximizes a specific objective function places over-identifying restrictions on the parameters of the bank's reaction function, the function that explains how the central bank reacts to changes in the state of the economy.

Imposing optimal-policy restrictions allows the researcher to treat the parameters of the objective function as parameters-to-be-estimated and provides estimates of the relative importance of various stabilization objectives. Given the loss function parameters and the non-policy parameters of the maintained model, the parameters of the reaction function are not free and can be inferred by use of the first order conditions associated with the central bank optimization problem.

The inverse control procedures I will talk about can be used in a variety of contexts. The researcher can assume that one equation of a VAR system is a reaction function. Or the researcher can take a structural equations approach and estimate the reaction function together with other structural equations in the model.

Estimation can be undertaken via maximum likelihood in which case the researcher uses a nested approach to impose the optimal-policy restrictions. Estimation can also be undertaken with generalized method of moments because the optimal-policy restrictions can be written as moment restrictions. In my talk, I will focus on GMM but make references to the other approaches.

Papers

"Asymmetric Monetary Policies? The Case of Germany and France," (with Ulrich Camen and Hans Genberg), *Open Economies Review, 2 (3)*, 1991, 219-36.

"Revealed Preference of the Federal Reserve: Using Inverse Control Theory to Interpret the Policy Equation of a Vector Autoregression," *Journal of Business and Economic Statistics, 13(4)*, 1995, 419-33.

"Econometric Policy Evaluation and Inverse Control," *Journal of Money, Credit and Banking, 38 (7)*, 2006, 1737-56.

"Generalized Method of Moments and Inverse Control," (with Gregory Givens), forthcoming in *Journal of Economic Dynamics and Control.*