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A General Equilibrium Money and Banking Paradigm: Discussion

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objectives is endangered by the inclusion of nonpersonal time deposits in the reserve base control network and by the omission of restrictions on checking accounts at institutions not covered by the control provisions of the Act.

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DISCUSSION

R. E. LOMBRA*: Writing and teaching about the definition, measurement, analysis, and control of monetary aggregates occupies the waking hours of many monetary economists. However, with several seemingly different paradigms employed, and apparent disagreements among the experts common, students and central bankers should be forgiven for viewing such efforts as akin to trying to solve the Rubik's cube blindfolded.

As Sagan's *Cosmos* has suggested, bringing order, logic, and structure to bear on such perceptions of chaos is an evolutionary process, wherein many "black holes" of ignorance stubbornly persist. Santomero and Siegel (S-S) have produced a carefully written, competent paper which represents a good start on restoring order to the literature on monetary theory and policy.

Economists spend too little time "building bridges"; blowing up old bridges and searching for new islands often seems more rewarding. This paper is a long overdue effort at bridge-building. It presents an analytical framework with potentially important pedagogical, analytical, and empirical ramifications. The major objective is to combine the richness of the general equilibrium portfolio

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approach developed by Tobin (and others) with the tractability of the multiplier approach pioneered by Brunner and Meltzer.

The synthesis presented by S-S is technically correct and their exercises in comparative statics demonstrate the advantages of being able to write down the determinants of the various monetary aggregates in compact form while still preserving the adding-up conditions and various restrictions on the underlying structural equations. Although the endogeneity of the various ratios comprising the multiplier was explicitly recognized and modeled by Brunner and Meltzer (and those who extended their work, such as Burger), S-S have succeeded in generalizing these earlier contributions within a more flexible analytical framework with obvious pedagogical advantages.

Ultimately, the payoff resulting from the solid foundation laid by S-S will depend on the new analytical insights and improved empirical representations it yields. With an eye toward this future work, I have several suggestions to offer.

1. This model, like most others, treats regulation and innovation as exogenous, discrete processes. Such treatment raises questions about the underlying micro-foundations governing the behavior of depository institutions. Is there any reason to believe that reserve requirements in excess of what institutions themselves would otherwise adopt, and binding interest rate ceilings, can be effective in the long run? Endogenizing such activity along the lines suggested by Kane's "regulatory dialectic" and Porter and Simpson's work on money demand would represent a major contribution.

2. S-S are able to collapse their n -dimensional system into three equations by making deposit rates a function of asset returns. Depicting financial intermediaries as rate setters and quantity takers, and therefore modeling the behavior of various claims on intermediaries as demand-determined, has obvious limitations (many of which were raised in the various reactions to Gramley and Chase's work by Brunner and others). For example, it is unlikely that the liability management practiced by large banks is appropriately modeled in this fashion. More generally, there is a group of depository institutions that offer the public a menu of claims. These institutions have different objective functions (e.g., profit versus nonprofit institutions), face different marginal tax rates, and operate under a heterogeneous set of regulatory constraints. The rate-setting behavior of these institutions, and the derivation of the attendant supply functions, is another fertile research area.

3. The static, single-period model developed by S-S naturally abstracts from issues relating to the maturity of assets and liabilities. Maturity mismatches and fluctuations in the yield curve have had noticeable effects on the portfolio behavior and performance of financial intermediaries. Moreover, regulatory policy has been influenced in a variety of ways by the maturity distribution of assets and liabilities. For example, the move to variable rates on many business loans and mortgage loans, which has the effect of shortening the maturity of such earning assets, coincided with the decontrol of certain deposit rates, and other actions by regulators designed to encourage the lengthening of maturities on liabilities. As Lindsey has noted, these actions, along with the growth of money market mutual funds, have resulted in a dramatic rise in the proportion of the nontransactions component of M2 bearing market-related yields. Is this "detail"

irrelevant for the determination of the monetary aggregates? In general, developing a dynamic counterpart to the S-S model would appear a worthwhile (albeit difficult) undertaking.

4. As Bryant, Frankel and Mussa, Henderson, and others, have argued in recent years, the closed-economy paradigm usually adopted by monetary economists contains a variety of pitfalls. Among other things, this literature on making monetary policy in an open economy implies that the multipliers linking policy instruments and the monetary aggregates are sensitive to interest rate differentials and the associated degree of substitutability between domestic and foreign assets.

5. Recent work by Barnett (and others) suggests that simply adding up various types of financial claims into monetary aggregates violates standard postulates of aggregation theory. His work on divisia indexes is especially relevant to a general equilibrium system describing the determination of the higher-order aggregates (M2, M3, and L).

6. Research surrounding the multiplier approach is most often motivated by various questions surrounding central bank attempts to control monetary aggregates. A large body of empirical work bearing on the appropriate procedures to be used and the degree of precision to be expected now exists. Within the S-S formulation, the a_i and k_i are the key parameters. How might these parameters be estimated and can these estimates improve on the Federal Reserve's monthly and quarterly "structural" models of the financial sector, and on existing empirical work on the multiplier by Johannes and Rasche, Balbach and others?

The Federal Reserve's penchant for setting multiple monetary aggregates targets and the associated uncertainties concerning the definition, measurement and determination of the various aggregates, have generated a pressing need for the type of research produced by S-S. The disorientation which often seems to prevail in both the literature and policymaking circles results in part from the failure to take adequate account of the relevant interdependencies within the financial system. By balancing generality with tractability, S-S have produced a synthesis which has the potential for clarifying and handling a number of the key issues in monetary theory and policy.

DISCUSSION

D. D. HESTER*: Sudipto Bhattacharya has presented several very interesting and elegant observations about monetary and banking theory. They are drawn from two examples which like ships passing on a foggy night are similar only in that they are watertight and have sufficient bouyancy (attractiveness) to stay afloat. Such seascapes are not my forte. I therefore intend to focus on each of the vessels and to say little about the overall scene. I do approve of Professor Bhattacharya's goal of attempting to integrate information-based models of investment and intermediation with theories of fiat money, but that port seems very far over the horizon.

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