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A B S T R A C T

MONETARY POLICY: A COMPARATIVE STUDY
OF ECONOMIC FORECASTING METHODOLOGIES

by

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Business executives and policy makers who are in a position to use models for forecasting or policy evaluation, are concerned with understanding the advantages of, and distinctions between, different modeling methodologies such as system dynamics and econometrics. Recognizing this need, a number of articles have been published in the system dynamics literature attempting to explain the merits and distinguishing characteristics of system dynamics. Such methodological comparisons are all too often less than illuminating, and in fact, tend to generate more heat than light.

There are three basic reasons why methodological comparisons commonly do not reach their communications objectives. First of all, attributes of various modeling techniques tend to lie along a continuum, and there are few sharp distinctions between methodologies that can be made validly or usefully. For example, system dynamics models may go farther than econometric models along key dimensions in capturing disequilibrium phenomenon; but it clearly is not appropriate to summarize the distinctions between the two approaches by saying that "system dynamics models incorporate delays" or "system dynamics models represent stock adjustment processes in response to disequilibrium. Many econometric models in fact have these characteristics, although they deal with dynamics and disequilibrium in importantly different ways. Second, it is extremely difficult to describe differences between methodologies in an illuminating way in the abstract, and without reference to specific models whose structure and results are to be compared. Third, even where models dealing with apparently similar policy issues are being compared, the comparison may nonetheless be extremely difficult in light of differences in style of approach, level of aggregation, and objectives of the different models.

The U.S. Congress Joint Economic Comittee has just completed a study that provides a unique opportunity for assessing some of the key methodological differences between system dynamics and econometric models. The JEC requested the U.S. General Accounting Office to retain three of the major macroeconometric houses--namely, DRI, Chase, and Wharton--to use their models to evaluate different monetary policy regimes. The monetary policy tests ranged from immediate cessation of monetary growth (in M1-A) to relatively high rates of

monetary expansion. Such evaluation of monetary policy is especially critical since the U.S. and other countries are today embarked on significant experiments in monetary policy. For example, the U.S. Congress is currently considering legislation that would request the Federal Reserve System to adjust monetary policy to target real interest rates, in contrast to monetary policy that targets either nominal interest rates or growth in specific monetary aggregates. Indeed, the outcomes of such policy experiments will exert important impacts on inflation, interest rates, unemployment, and various capacity measures within the macro-economy and within industry.

In performing these evaluations, first the GAO used each of the three econo-metric models to produce an "unmanaged" simulation, meaning that the GAO staff executed the tests based on public versions of the econometric models, and without in-course modification or adjustment by the model builders. The three econometric houses were then asked to prepare their own "managed" simulations so as to produce results which they felt to be most consistent with theory and empirical observation. The results of these tests were striking. For example, an unmanaged simulation of the DRI model showed virtually no impact on inflation after 10 years from a policy of zero money growth, while Treasury bill rates rose, and stayed at, nearly 35%. A "managed" simulation conducted by DRI to test the same monetary policy regime yielded a long-run Treasury bill rate of 6.9%.   Dr. Robert Weintraub, Senior Economist for the Republican membership of the Joint Economic Committee, and Study Director for this evaluation, summarized the results of the econometric models as "ridiculous nonsense."

This paper proposes to utilize the Management Technologies' U.S. Economic Model to simulate the same monetary policy tests performed on the three macro-econometric models. Such comparison is likely to be methodologically revealing for several reasons. First, the Management Technologies' U.S. Model is at least of comparable detail and sophistication to the econometric models. Second, the U.S. Model has been developed for similar purposes of short-term (1-2 years) and medium-term (5-20 years) forecasting and analysis of various industry and govern-ment policy measures. Third, the U.S. Model has been extensively validated his-torically and empirically, so that model details and parameter values are not simply "representative" a priori selections, but meet the dual tests of being a priori satisfactory and historically accurate. Policy tests thus far performed on the U.S. Model in fact illustrate significant differences from the econometric results, both near-term and longer-term.

Following on the above objectives, the paper will be developed as follows: First, the background of the monetary policy issues will be discussed and the methodological objectives of the paper will be laid out. Second, specific policy evaluations based on the U.S. Model will be contrasted to results of the econo-metric models; empirical validity of the results will also be assessed. Third, the policy results will be used to abstract specific differences in the models that yield the individual results; for example, the models have importantly differing treatments of liquidity and impacts of monetary variables on investment and expenditure decisions. Fourth and last, generalizations will be drawn from the specific model differences to develop a number of basic methodological points of comparison that transcend the particular policy analyses.