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**Agricultural Trade Modeling – The State of Practice and  
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COMMENTS ON  
AN APPROACH TO MODELING MACROECONOMIC  
LINKAGES IN TRADE MODELS: WITH AN APPLICATION  
TO AGRICULTURE

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Douglas McTaggart has attempted to construct a macroeconomic model that can be used to analyze the agricultural sector of the economy. The model is intended to be modern in the sense of borrowing from recent developments in the macro literature. Applicability to agriculture requires a certain amount of disaggregation.

The task is an ambitious one, given the current disarray of macroeconomics. A widely accepted successor to the earlier Keynesian and Monetarist models has not yet emerged. Disagreement about the appropriate features of a closed-economy macro model also extends to open-economy macro issues. For example, disagreement about the effect of budget deficits cause the dollar to appreciate or depreciate, which determines whether policy stimulates or retards agricultural exports (1). 1/ The poor performance of domestic models in explaining the demand for money and interest rates has been matched by the poor performance of structural models in explaining the behavior of exchange rates. According to Meese and Rogoff's analytical survey most exchange rates models did not outperform a simple random walk model in explaining recent behavior (7).

An ambitious goal of McTaggart's paper is to treat agricultural variables and the exchange rate as endogenous variables. Some studies of the agricultural sector treat the exchange rate explicitly as an exogenous variable, but often it is simply ignored. Omission of the real exchange rate is legitimate if purchasing power parity always holds, that is, the real exchange rate never changes. However, evidence since 1973 shows pronounced and persistent deviations from purchasing power parity (4). Indeed, one of the major trade issues in recent years is the extent to which dollar appreciation from 1980 to February 1985 retarded agricultural exports (5). Specifying the exchange rate as an endogenous variable in an agricultural trade model may or may not be worth the additional complexity that results. However, whether the exchange rate is endogenous or exogenous, the model must specify how the agricultural sector variables are affected by exchange rate.

The paper rejects the use of the "discredited" Keynesian and Monetarist paradigms. It borrows from two strands of the recent literature: (a) log linear rational expectations models and (b) equilibrium models based on utility maximization subject to a budget constraint. The paper attempts a synthesis that overcomes the complexity of the latter approach and the absence of asset markets of the former approach.

The general macro model contains four explicit markets: domestic output, money, bonds, and foreign exchange. There are 19 endogenous variables and 3 prices: domestic price level, interest rate, and exchange rate. The general model is designed to show the effect of various monetary, fiscal, and exchange rate policies on the economy. At the level of abstraction used in the paper, firms do not appear explicitly. Readers looking for an aggregate supply

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1/ Underscored numbers in parentheses refer to sources cited in the References following this article.

function based on a production function and real wages will not find one. The exchange rate specification is so general that the elasticities, absorption, and monetary approaches turn out to be special cases. More general models have some advantages, but they usually fail to provide unambiguous qualitative results. For example, the statement that fiscal expansion will cause the exchange rate to rise, fall, or remain constant is both general and uninformative.

The paper does not provide an analytical solution to the model. Nonlinearities present a problem and depend on the prevailing policy regime. This so-called Lucas critique may have special relevance for the agricultural sector because of changes in both exchange rate regime and the commodity policy regime. The potential problems are both theoretical and econometric.

Partly because of the lack of an explicit solution, it is not clear whether the benefits of the new synthesized model are worth the cost in terms of complexity. Does the model have implications that are distinctly different from the earlier discredited models? An example of an earlier conventional model is the Massachusetts Institute of Technology, University of Pennsylvania, and Social Science Research Council (MPS) model used by the Federal Reserve Board of Governors (2). The most interest-sensitive sector in the model is the housing sector. Simulation using the MPS model showed that the main effect of the 1981 Federal tax cut was to switch expenditures from housing to current consumption (3). Much has been said recently about the interest sensitivity of agriculture, and the question is whether this relationship can be better represented by adding an agricultural sector to a conventional model such as MPS or constructing a new model along the lines suggested by McTaggart.

The apparent purpose of the paper is to specify an agricultural sector that is capable of being used for empirical analysis. Evidently, this is mainly work for the future, as the agricultural sector is discussed only in the last 4 pages of the paper. It would be instructive if the model were capable of answering the same questions posed to the large scale models presented earlier at this conference, namely, what would be the effect of (1) a  $k\%$  reduction in agricultural supply and (2) a given trade liberalization policy.

The model is intended to capture three distinctive features of agriculture: (1) openness to international trade, (2) capital intensity, and (3) the importance of price expectations for current production. The implications of greater openness for agricultural trade are not clear. Earlier predictions that floating exchange rates would add to risk and reduce the volume of international trade have found little support in empirical work (9), although exchange rate fluctuation may alter the commodity composition of trade (6). With respect to price expectations, it would be useful to formulate the model so that it is capable of analyzing the kind of monetary surprises considered by Barro (8).

A final point relates both to the McTaggart paper and, more generally, to the effort to model agricultural trade. There has been a trend toward adding more agricultural products, more countries, and more nonagricultural markets to formal models. One legitimate reason for more complex models is that simple two-region models cannot answer certain questions such as the effect of a given policy on the multilateral pattern of trade. However, for many purposes, simpler models may be satisfactory, and the additional comprehensibility of simpler models is a major advantage. The appeal of large

models is that they promise more information to the user, but the user cannot place much confidence in the information if no one, perhaps including the model builder, can understand why the results are what they are. It has not yet been demonstrated that bigger models are necessarily more useful than smaller models.

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