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HOW CAN THE POLICY MODELS SERVE THE FARMER DECISION MAKERS?[1/]

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Few issues generate more lively discussion and debate than do questions related to farm policy. This has sparked repartee at dinner tables in farm homes, at rural meetings, and in the halls of Congress. And this has been going on for many years. This innate interest in farm policy has provided the Cooperative Extension Service with excellent opportunities for educational programs. Such programs can serve not only to inform farmers, agribusinesses, others in the food system, and the general public about the choices, but also to teach economic principles.

There are some excellent examples of well developed extension programs in farm policy. Last fall when I was interviewed for a videotape on mandatory production controls, the background materials which helped me most were a set of pamphlets prepared by a national extension committee in the early 1960s.

Effective as many of our policy extension efforts have been, we have not been able to be as definitive as we might wish to be in explaining the consequences of alternative policies. Considering the sophistication of our extension audiences today, it is not sufficient to say that mandatory production controls would raise consumer prices

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and lower Treasury costs. They want to know how much and the timing of the changes. This type of information policy models can provide.

As evidence of the interest in the level of detail, the FAPRI (Food and Agriculture Policy Research Institute of Iowa State University and the University of Missouri) analysis of the Harkin/Gephardt Bill has been given substantial visibility in the popular press. The July 1987 issue of Michigan Agriculture, published by the Michigan Democratic Agriculture Committee, carried extensive references to the study. A recent issue of Farm Bureau News (published weekly by the American Farm Bureau Federation) featured an article on the effects of freezing the level of federal outlays as analyzed by the Washington University Macro Model (WUMM) of Lawrence H. Meyer and Associates.

With improved microcomputer technology and growing availability, new opportunities will rapidly emerge for use of policy models in our extension programs. In recent months, I have developed a fairly comprehensive model of the grain-soybean-livestock sector for the domestic economy and an aggregate international sector to generate export demands. While patterned after the MSU Agriculture Model, this model, known as AGMOD, was basically built from scratch and estimated from annual data beginning in 1960. AGMOD was made possible by a new version of the software package Micro TSP, which just became available in 1986 (Lilien and Hall).

AGMOD presently includes 186 equations, 180 endogenous variables, and 44 exogenous variables. The model could be expanded to a total of 300 variables which is the current maximum for Micro TSP. Micro TSP is not only an excellent program for regression analysis, but it provides a convenient way to formulate models with those equations. The Gauss-Seidel procedure is used to solve the models.

With an upper limit of 300 variables, I have had to be very selective in terms of which items to include and how much detail was really needed. While some sectors of the agricultural economy are omitted, the model is capable of generating answers to the salient policy questions. The relative simplicity of the model facilitates updating,

re-estimation, and necessary trouble-shooting that modelers must regularly do. The scale of the model is also an asset in explaining and demonstrating its operation to others, particularly lay audiences. A general schematic of the model is attached.

AGMOD generates annual projections to the year 2000. On my Zenith 248-82 with 512 K, the solution generally is completed in two to three minutes. This facilitates the examination of numerous alternative assumptions about farm policies and other exogenous variables. With a little imagination, microcomputer models such as this could be easily incorporated in extension policy education programs. The process could be demonstrated live with small groups and, with the improvement in computer screen projection technology, could be used with large groups as well. My limited experience in showing this model to lay audiences has been encouraging.

We do need to guard against the possible misuse of these models and their results. We must be liberal with the usual caveats concerning the validity of the assumptions and the inherent errors in the model and the data. Since the policy issues are very sensitive, extreme care must be taken in the presentation of the results. Political figures are tempted to extract the information that supports their case and ignore the negative.

One of the deficiencies of our policy models is that we have not adequately incorporated risk factors. Alternative scenarios are usually depicted by single-valued projections with no direct accounting for the differences in risk. One way to begin to incorporate risk (and model error as well) in policy models is to apply random number generators to the equations. Repeated solutions would trace out the implied probability distributions on the results.

I want to take this opportunity to congratulate Abner Womack and his colleagues who have developed and maintained FAPRI. This is a respected research group that has demonstrated the value of econometrics in policy analysis. Our Michigan State Agriculture Model group has operated somewhat in a parallel fashion, but with

differences in emphasis. We have benefited from the FAPRI experience and I hope the information we have shared with FAPRI has benefited them.

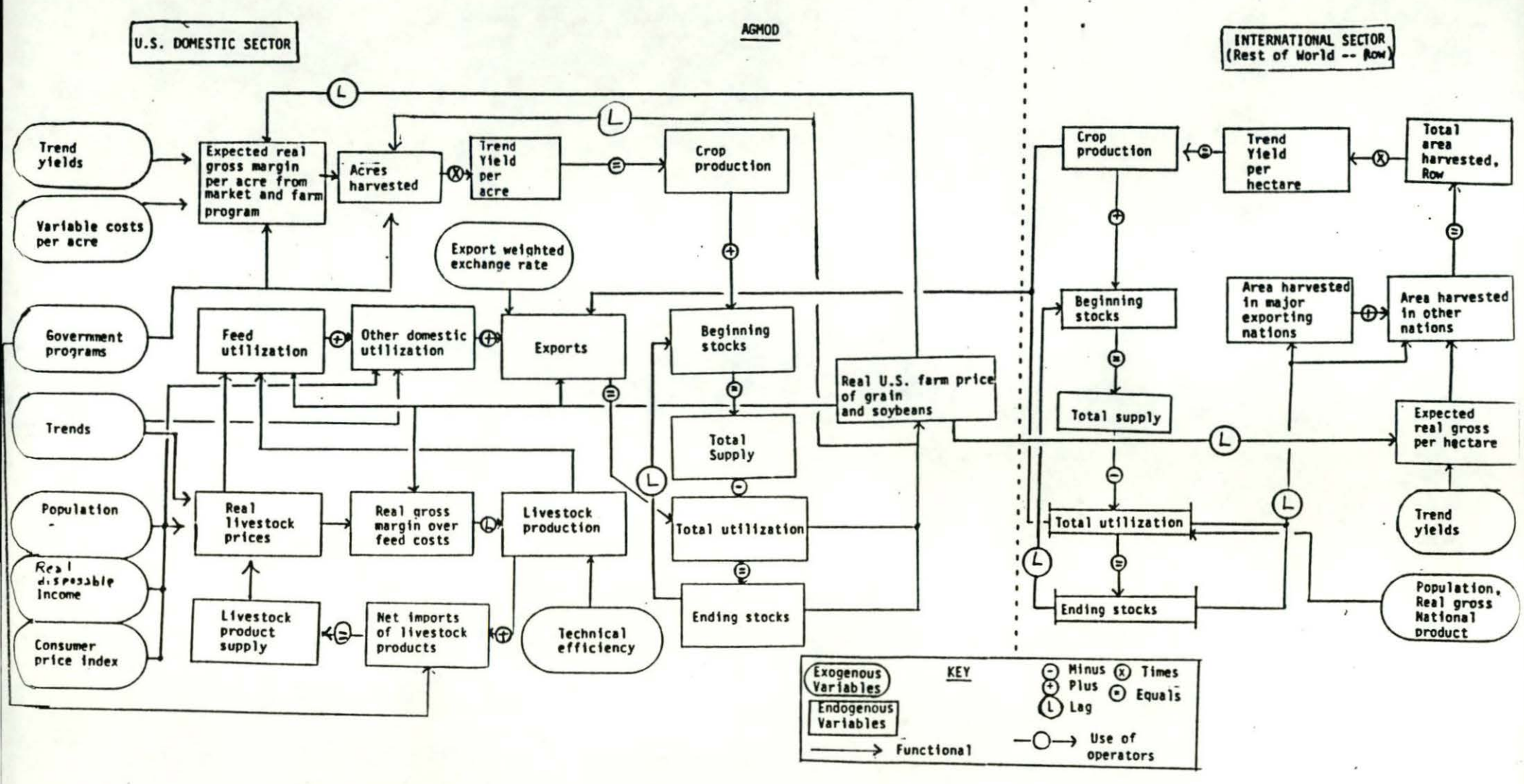
AGMOD
U.S. DOMESTIC SECTOR
INTERNATIONAL SECTOR (Rest of World -- ROW)
Trend yields
Variable costs per acre
Government programs
Trends
Population
Real disposable income
Consumer price index
Expected real gross margin per acre from market and farm program
Acres harvested
Trend Yield per acre
Crop production
Export weighted exchange rate
Feed utilization
Other domestic utilization
Exports
Beginning stocks
Total Supply
Total utilization
Ending stocks
Real U.S. farm price of grain and soybeans
Real livestock prices
Real gross margin over feed costs
Livestock production
Livestock product supply
Net imports of livestock products
Technical efficiency
Crop production
Beginning stocks
Total supply
Total utilization
Ending stocks
Trend Yield per hectare
Total area harvested, ROW
Area harvested in major exporting nations
Area harvested in other nations
Expected real gross per hectare
Trend yields
Population, Real gross National product
KEY
Exogenous Variables
Endogenous Variables
Functional
Minus
Plus
Lag
Times
Equals
Use of operators

FIGURE 1

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