PARTIAL SYSTEMS OF DEMAND FUNCTIONS

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The work represented by this paper under the heading partial

systems of demand equations includes:

1. Analyses where the emphasis is on a single commodity or small

    group of commodities and the vertical linkages in the farm to

    consumer marketing channel.

2. Analyses of single commodities or a small subset of commodities

    where estimation methodology may be the prime concern.

The analyses are bound together under this heading because they,

in general, have not traditionally been developed from an underlying

utility function. This means that adherence to the general theoretical

restrictions is not guaranteed. While these small systems or single

equations could be derived from a framework composed of a set of specific

restrictive assumptions about the utility function, these assumptions

have generally not been stated.

Because each type of analysis differs in objectives and reasons

for use, each will be treated individually.

Commodity Models With Emphasis on
the Vertical Market Structure

Emphasis on the vertical market structure has long been popular for agricultural economists. Some might be surprised, however, to find this topic discussed at a symposium with a demand analysis emphasis. The symposium panel would be seriously lacking if this topic of vertical structure research was not discussed. The importance of this area of "demand" research stems from the importance of being able to analyze the impact of policy variables active at one level in the marketing channel on participants at another level. This could involve the impact of policy actions at primary producer levels on consumers and/or the impact of consumer policies and programs on primary producer level prices and income. Examples of the former include Mann and Paulsen's evaluation of feed additive restrictions within the context of an econometric simulation model that included production and demand relationships. Examples of the latter include a Lee's study which examines the impact of retail advertising on consumer purchases which feeds through the system to impact grower returns. Additional policy variables that act on behavior at other intermediary points in the marketing channel could also be encompassed by models of the vertical channel and evaluated in terms of their impact on consumers and producers.

Models of the vertical channel require the economist to become more of a commodity specialist as opposed to strictly a "demand analyst." The nature of the work requires that the analyst perhaps be concerned about

theory of consumer behavior, as well as firm behavior and the relation-
ships among firms and between firms and consumer. Most importantly,
the analyst needs to be concerned about whether the model accurately
portrays the commodity channel of interest and accurately reflects the
impacts of policy variables. The commodity specialist will need to be
versed in demand analysis, firm behavior and production relationship.
This may mean that projects with the vertical dimension emphasis will
need to employ the resources of both production, marketing and consumer
behavior specialists along with an econometrician if these talents are
not embodied in one individual.

There may be situations where the consumer demand portions of these
models can be treated as separate from the rest of the vertical model.
The key elements that determine if consumer demand can be treated
independently are: 1) the question of whether all of the explanatory
variables in the demand relationship are predetermined (either exogenous
or lagged endogenous) variables and 2) whether the error structure
assumptions can support single equation estimation procedures. These
elements need to be evaluated for each commodity in the complete or
partial system given the data base employed, observation period and
observation unit. While it is possible to envision situations where
the criteria are met such that single-level models are justifiable,
generalizations as to when those situations exist are not easy.

Estimation of Partial Systems at a Single Level in the Marketing Channel

Analyses of demand for a single commodity or a small group of
commodities without modeling the vertical marketing channel is done

for a variety of reasons. First, it is possible that the demand rela-
tionships are reasonably independent from other equations that might
suitably be in the vertical structure. The justification for consider-
ing one commodity independent from all others may be based on either
budget or time constraints or a desire to capture the nuances of the
commodity in ways that would be consistent across several commodities.
The researcher must evaluate the trade-offs between complexity of the
model, theoretical considerations and application constraints (data,
time, expense). These subleties may require estimation methodologies
which would make application of the general restrictions difficult.
Uniqueness of a partial data base is another possible reason for this
type of analysis. Others have argued that their demand function is
"for the representative consumer" (Pope, Green and Eales, p. 7) and
that this allows them to assume that prices are fixed and not simulta-
neously determined.

Models in this category have used various schemes to capture habit
formation, to estimate flexible functional forms, and to estimate
parameter variation over time (Tilley; Pope, Green and Eales; Ward and
Myers). The difficulties of specifying or maintaining the Engel
aggregation and Slutsky conditions across equations would be especially
substantial if the parameters of each of the equations were found to
vary over time and to change in different ways. Similar problems arise
if the equations in the model assume a different functional form, each
of which cannot necessarily be derived from the same utility function.

Needed Theoretical Developments

Gardner in 1975 and Heien in 1980 make important theoretical strides in the direction of linking the retail and farm levels in the vertical sector together. However, both Gardner and Heien develop their theoretical models in terms of a single product. The models do not deal with demand interrelationships at the retail level or resource competition by multiple product producers at other levels in the channel.

The theoretical importance of considering multiple product relationships in food store management decisions is presented by Holden. Aggregate food store pricing-decision models have, however, ignored potential interrelationships in pricing decisions. Perhaps in the aggregate model of retail food store pricing behavior, the interrelationships between pricing decisions are not as readily apparent.

Thus, the current state of the modeling efforts includes a theoretical model of consumer demand across all commodities consumers purchase. But the available models of the vertical channel have not included more than one commodity. The obvious call would be for theoretical treatment of several commodities within the vertical system.

Conclusions

It is my feeling that the demand literature division between research with a broad horizontal perspective at the consumer level and research with a vertical marketing channel emphasis is becoming less desirable for the profession. The policy questions being asked by federal and state regulatory agencies require evaluations of economic impacts from

the producer (perhaps even input producer) to the consumer level for both the commodities for which a policy is proposed as well as for related commodities at the production, distribution or consumption level.

This type of prescriptive analysis requires economists with broad theoretical foundations who have the ability to pull all of the elements of micro-economic theory into a model of the vertical market structure for multiple commodities.

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