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Part II · Responses to Market Transition

Placing modern firm strategies and marketing policy into a conceptual framework appropriate for an industrialized economy is the task of these papers. Conceptual paradigms change within the economics discipline. These changes may be in response to concerns like those discussed in Part I, or through a more independent innovation process. Paradigm innovation is shaped by the peer review process. It has sensitivity to real problems but also has sensitivity to quality of abstract thought. Regardless of the way conceptual paradigms change, these changes condition how we approach and frame issues in economic analysis.

Strategic market behavior relates to the growing presence of large multi-market firms in the food marketing system and the fact that these firms have a larger scope of action than atomistic firms in a purely competitive environment. Research in this area analyzes how large corporations organize and position themselves in markets to improve corporate performance. It is important to identify major lines of inquiry that come from different paradigms of economic thought and describe their use in strategic market analysis of agribusiness industries.

Policy centers across our discipline use relatively large stables of resources and maintain large economic models. These centers have a unique experience with research methods including simulation, estimating and using large econometric models and making economic and policy projections. This is a large and well financed pattern of work relating to public policy toward the storable commodities. This work experience provides a basis for both assessment of a set of research methods and assessing trends in the public policy process. What are the lessons learned in this experience that can be used in guiding policy for marketing issues in non-storable farm products and food products manufactured from them?

Implications of New Industrial Organization and Demand Models for Marketing Research

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Developments in economic theory are usually evolutionary in nature, representing shifts in emphasis rather than movements in truly new directions. The speed of the evolution has been rapid in the field of industrial organization over the last decade, while research on demand models, particularly on models of demand for food, has been evolving at a slower pace.

We discuss the major developments of relevance to agricultural and food marketing policy and what these developments say that the old ones did not. We focus on conceptual developments in four key areas: vertical coordination and the role of transaction costs; theoretical and empirical studies of strategy; information; and consumer demand models.

Vertical Coordination Models

Models of vertical coordination play a particularly important role in analysis of the performance of agricultural and food markets. Marked differences in market structure between production, processing and distribution sectors are often fertile grounds for analysis of the choice of vertical coordination mechanisms, the impact of those choices on sector performance and the determination of returns to individual participants. The major developments in

the study of vertical coordination in recent years stem from extension of the theory of the firm into areas in which neoclassical economics offers relatively little insight – the internal organization of the firm and the choice between internal production and external purchase of inputs. Working from Coase's original statement of the question, Oliver Williamson (1985, 1989) led in formalizing the analysis of vertical relationships using transaction costs.

Comparing New and Old Approaches

The great value of the transaction cost model, as compared to older approaches, is its standardization and formalization of discussion of important factors influencing the choice of vertical coordination mechanisms (governance structures). These governance structures include spot markets, contracting, vertical integration (internal organization) and numerous variations on these arrangements. Williamson identifies the key characteristics of transactions that influence the choice of vertical coordination mechanism as transaction frequency, uncertainty and asset specificity. Asset specificity, which encompasses the economist's notion of sunk costs, is a particularly key determinant in the model just as it is a crucial point in many industrial organiza-

tion models of firm strategy. In the Williamson model, the firm's objective function is to minimize production *and* transaction costs. This objective function underscores the importance of production and organizational expertise to a firm's success.

A significant body of research employing the transaction cost model has been published in recent years and, as the following sections indicate, the language of the model is permeating industrial organization research. The understanding of vertical coordination is also being forwarded by related research on the operation of capital markets, principal-agent problems arising from the separation of ownership and control, and the design of efficient internal hierarchies within firms (Holmstrom and Tirole).

Model Limitations

Despite its value, the transaction cost model has some significant limitations that can lead to strange analytical results. While Williamson's model is often claimed to be part of a new institutional economics, in its purer forms it is curiously lacking in institutional detail. Its focus on internal organization can short-change consideration of external factors such as strategic behavior and positioning; possible exploitation of information asymmetries; and the exercise of market power. For example, focusing on the details of contract provisions can obscure the larger context in which the contract is formulated, including the relative access to information and degree of bargaining leverage enjoyed by contracting parties in an industry.

The transaction cost model is very useful for marketing research if analysis of strategic behavior is incorporated. The

scope of application of the model is likely to increase in the future as well. While, to date, the model has been mostly applied to analysis of firm-firm relationships, its extension to analyze firm-consumer relationships is likely to develop rapidly.

Empirical Studies of Strategy

The major development of the 1980's in industrial organization research was a body of theoretical work labeled the "new industrial organization" and accompanying empirical work labeled the "new empirical industrial organization." The new industrial organization (NIO) takes the traditional price-theoretic approach and adds the Williamsonian transaction costs and game theory. The emphasis is on the formal analysis of strategies, taking into account institutional constraints such as transaction costs. The new empirical industrial organization (NEIO) concentrates on modeling market power, marketing expenditures and other factors that affect market outcomes explicitly (Bresnahan; Perloff).

Comparing New and Old Approaches

NEIO and the more traditional Structure-Conduct-Performance (SCP) studies differ in terms of the questions they ask, the type of empirical tools used and the underlying theories. NEIO studies investigate two key questions:

1. How much market power is exercised?
2. What factors permit firms to exercise this power?

NEIO studies presume market power cannot be directly observed and must be estimated. These studies concentrate on exogenous variables (such as costs of pro-

duction, inherent costs of entry, taxes, government regulations) to explain variations in market power (e.g., Kolstad and Wolak; Sullivan; Gelfand and Spiller).

In contrast, SCP empirical studies assume that market power (or its effects) can be directly observed. For example, SCP studies use, as a proxy for market power, the gap between prices, price and some cost measure, profits, Tobin's q , or a rate of return. SCP empirical studies examine a variant of the second question. Moreover, SCP empirical studies focus on variations in market power with changes in endogenous variables (such as concentration ratios and advertising).

Most, but certainly not all (See Hall), NEIO studies use structural models (demand, marginal cost and equilibrium conditions) to analyze the exercise of market power. SCP studies use quasi-reduced form specifications (though often including endogenous variables on the right-hand side). By explicitly estimating demand curves, NEIO studies can attempt to explicitly model the effects of marketing efforts. Although explicitly incorporating advertising and other promotional activities into the model is straightforward, unfortunately, to date, few studies of advertising are based on structural models. A promising application of NEIO models to agricultural and food marketing is in the formal modeling and generation of quantitative results on marketing margins (e.g., farm gate, retail) and exercise of market power in oligopolistic markets.

SCP studies have been criticized for not being based on explicit theories. The theoretical underpinning of most of SCP studies is that higher entry costs are likely to raise market power (though the mecha-

nism is rarely fully explained). Unfortunately, there is also a gap between theory and NEIO work. Most of the forefront theoretical work on oligopoly uses game theory, but most game theories are too general to be applied easily in structural empirical work (See, however, Sutton). As a result, most NEIO studies have used conjectural variation models.

Multi-period Models

An important focus of theoretical work has been on differences in firm strategy and market outcomes when firms are engaged in ongoing interaction versus one-time encounters. As theoreticians have shown, collusion is more likely in the ongoing (multi-period games) case than in the static (one-period games) case. This theoretical work has influenced empirical research by encouraging the use of multi-period game theory models. Since agricultural and food markets tend to be quite stable, featuring the same major players year after year, the multi-period models are likely to be useful in empirical research on these markets.

NEIO studies use at least two types of multi-period models to estimate market power: models of collusive behavior and models of behavior with costs of adjustment. For example, game theorists have modeled Stigler's cartel theory as a supergame (multi-period game) over repeated static games. In one version, random fluctuations in price resulting from fluctuations in demand or supply costs make "cheating" by cartel members hard to detect because the price fluctuations could be due to either cheating or shifts in economic conditions. To prevent cheating, all cartel members agree that if the market price drops below a "trigger price," each

firm will expand its output to the precartel level for a certain period of time and prices will fall as a result. No firm that expected other firms to stick to this agreement would want to cheat on the cartel because its short-run gains would be less than the loss due to the end of the cartel. Porter and Lee and Porter use this theory to estimate a model of 1880's railroad cartel behavior. Obviously this approach has implications in other areas important to agricultural and food marketing, in particular to food processors' choices of marketing activities over the long run.

✓ Theoretical work suggests that dynamic models must be used for markets in which firms have substantial adjustment costs (training new workers, storing inputs or outputs, or accumulating capital), there is learning by doing, or if demand today depends on quantities in previous periods. ✓ Many marketing and economic studies (e.g., Baltagi and Levin) estimate demand curves with this property, as do studies of ✓ durable goods and exhaustible resources, such as aluminum (Suslow) or oil (Matuses). ✓ Karp and Perloff use a dynamic oligopoly model with a linear demand curve and quadratic costs of adjustment to estimate steady-state price-cost margins for the international rice export market. In other work, Roberts and Samuelson use a dynamic oligopoly model with reasonably general functional forms to reject the hypothesis that the cigarette market is competitive and explicitly look at advertising behavior. With their general functional form, however, they cannot estimate the degree of market power.

Following the lead of Roberts and Samuelson, a number of authors are building models that take explicit account of marketing expenditures in dynamic models.

There are many opportunities to apply these models to agricultural and food markets, particularly since data on these markets is relatively plentiful. Future studies could ask whether a firm's promotion today steals sales from competitors today or from the firm's future sales. Similarly, studies could examine the effect of margins on future entry.

Information Models

The possession, control and use of information is a key element in industrial organization modeling of firm strategy and is usually a key determinant of a market's performance results. A special focus of theoretical work has been on the flow of information between firms and their buyers (consumers). Theoretical work on asymmetric information in this area reaches some surprising results (See the summary in Carlton and Perloff). We concentrate on four topics: limited information about quality, limited information about price, advertising and disclosures. We conclude this section with a few comments on empirical studies in agricultural and food marketing.

Limited Information about Quality

Theoretical work suggests that if consumers have limited information about the quality of a product, either there will be no market for that product or, if a market exists, different quality products are produced than in a world of complete knowledge (Akerlof; Leland). Typically, only the lowest quality products are produced. Expert information, reputation, standards and certification may provide consumers with information about quality and rectify these problems; however, standard setters often behave anti-competitively. Mar-

keting effectiveness turns on credibility. As noted below, these theories have important implications concerning the use of labels, warranties and guarantees, which are increasingly being used or considered in food markets for signaling quality to consumers.

Limited Information about Price

Theoretical work suggests that where consumers have limited information about price, the market may not exist or, if it does exist, even small firms may price above marginal cost: Perfect competition is impossible (Scitovsky; Diamond; Salop and Stiglitz). Even with a homogeneous good, stores may charge different prices. The "law of supply and demand" and the "law of a single price" do not hold. Multiple price equilibria become likely and depend on how many consumers are informed (hence, marketing matters).

It is important to note that in many models only certain types of price information affect the equilibrium. For example, lowering search costs in the Diamond model has little effect. Advertising may affect the market, however (Butters), as does information about market shares (Smallwood and Conlisk). Experiments show that grocery store price information can have significant effects on equilibrium prices (Devine and Marion). Theory also suggests that in only some markets does price convey all the necessary information (Grossman and Stiglitz). A firm may take advantage of consumers' limited information to price discriminate. Indeed, it may want to increase their ignorance through marketing (Salop).

In the models, whether information increases welfare depends on whether it is

public or private and on other factors. The implications of these models are important to understand and evaluate as the entire range of information policies in place in agricultural and food markets is reconsidered in the future.

Advertising

Most food processors advertise, many quite heavily. Theory may have much to contribute to understanding this strategy. Theory suggests that advertising's credibility and effectiveness turns on the nature of the products (search versus experience goods) and that the welfare implications of advertising are unclear. Informational advertising is almost certainly good because it may help solve the lemons problem or reduce prices (e.g., Benham). Persuasive advertising may be excessive – though the Dixit and Norman theory is very controversial. A major contribution of information theory as it pertains to advertising is likely to be in the use of models based on the new theories to study the reputational effects of name brands, which are a key factor in food markets.

Disclosure Laws

Disclosure laws will play an increased role in the marketing of agricultural and food products in the future as marketing increasingly turns on the presence or absence of particular attributes (e.g., pesticide residues). Theoretical developments have implications for analysis of disclosure laws and false advertising. Surprisingly, disclosure laws may not help (Grossman) and may be unnecessary if anti-fraud laws are enforced. Mandatory disclosure laws may encourage firms not to do research (Matthews and Postlewaite) or introduce new products (Ippolito and Mathios).

As discussed further below, additional research is needed on the effects of new federal labeling requirements. Presumably these laws will have effects on price, quality and safety in many food markets.

Empirical Studies

So far, there has been relatively little empirical work that explicitly incorporates these new information theories to study agricultural markets (though there are a number of studies in other markets). Chief examples to date are the work of Devine and Marion on information programs, various studies of the effects of advertising (e.g., Liu and Forker), studies of the effects of public information programs (Lave; Antonovitz and Roe; Brown and Schrader) and studies of the welfare implications of labeling programs (Sexton; Viscusi; Caswell). This situation will begin to be rectified as research on the impacts of new food labeling regulations is initiated and reported.

Consumer Demand Models

Shifts in consumers' attitudes toward food, particularly the growing emphasis on links between diet and health, have increased, in agricultural and food marketing research, the emphasis on understanding consumer demand. The major research development is adoption of a Lancasterian demand model approach (Lancaster), with its links to Becker's household production model. This approach views products, in our case food products, as bundles of attributes, both desirable and sometimes undesirable. Skeptics will note that the adoption of the Lancaster model, if now here, has been a long time coming.

Attribute-based demand models are gaining prominence at this time because of a need to model and empirically measure

demand for two particular food attributes: safety and nutritional content.

Valuation Methodologies

An additional conceptual development in demand research is the adoption of methodologies from the resource economics field that endeavor to place values on demand for food attributes, again particularly to value food safety and nutrition. These methodologies include contingent valuation; hedonic pricing (van Ravenswaay and Hoehn 1991a); experimental economics; conjoint analysis; and cost of illness studies (Roberts and Foegeding). These demand and valuation models are attempting to address such major issues as how consumer risk perceptions are formed; how the perceptions are translated into purchasing habits; and how individuals and society should value safety or nutritional content assurance or improvement. As in the resource economics field, a major point of contention is the reliability of valuation estimates.

Quality Signaling to Consumers

Quality signaling plays a crucial role in the demand for food products. If particular attributes are increasingly important to consumers, then a key measure of the food system's performance will be its ability to deliver specific products with those attributes to consumers. As the above section on information suggests, the environment necessary to support markets for quality may be quite demanding. If an attribute is important (or can be made to be important), how is its presence (or absence in the case of safety risks) to be signaled to consumers (Akerlof; Grossman; van Ravenswaay and Hoehn 1991b)? How much regulation of advertising and labeling

will be necessary (in the eyes of society) to insure that the public is adequately informed and not deceived (Grossman; Ippolito and Mathios)?

In pursuing quality signaling issues, we come full circle to the modeling of vertical coordination in agricultural and food markets. Development and empirical testing of models of such quality signaling is in its early stages, with few published papers yet available. The task is challenging since models must incorporate consideration of information flows, firm strategy, transaction costs and government policy. The major research development needed here is simply to link as many of these issues as possible to produce a more complete picture of how markets operate.

Concluding Thoughts

Development of economic theory and models has a tendency to take on a life of its own with researchers pursuing interesting, and sometimes important, ideas. There is a link between theoretical developments and day-to-day food and agricultural policy decisions, but often not a very close one. This lack of closeness is due to at least two factors. First, models often cannot and do not reflect the complexity of strategic interactions within and between industries and therefore cannot forecast well how an industry will react to policy changes. Second, theoretical models have difficulty in reflecting the political tradeoffs inherent in legislative actions, agency rule-making and executive agency enforcement decisions.

However, creative application of modeling and empirical efforts can have great leverage in policymaking, especial-

ly when agencies are unsure and have little existing guidance as to what will happen as a result of policy changes. A recent example is the Food and Drug Administration's (FDA) rule making related to the Nutrition Labeling and Education Act of 1990, which mandated a complete overhaul of food nutrition labeling. The FDA's thinking was influenced by work conducted by Ippolito and Mathios at the Federal Trade Commission and by FDA-commissioned work on the benefits and costs of nutrition labeling (French, et al.). The benefits analysis especially made timely use of information updating models (Zarkin and Anderson). Another possible example of this type of leverage may result from the extensive body of research on the structure and performance of sectors of the livestock industry recently commissioned by the U.S. Department of Agriculture's Packers and Stockyards Administration.

These are examples of how closer links between theoretical research, empirical work and the needs of policymakers can be forged. To achieve these links, government agencies or other interested parties will simply have to commission the relevant theoretical and empirical work. Access to information and a grant-based incentive for research are the best, and probably the only, means to insure needed work is accomplished.

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