

Discussion

The task assigned the panelists is to appraise the papers presented at the conference with special emphasis on their contributions to management, marketing, and economics and to indicate their implications for future research. I shall, as the economist on the panel, concentrate first on the contributions to economics.

One cannot properly engage in such an appraisal without first offering a brief analysis of the state of the art (or science) as the authors of the papers found it. One of the several programs devoted from its beginning to improving the economic theory of the firm summarized the situation in its 1974 progress report in rather doleful terms. Micro-economic theory, when applied to actual experience, consists essentially of simple illustrative exercises and carefully selected case studies. Most of the exercises tend to be trivial, and most of the cases heavily truncated. "Moreover, few of the empirical studies conform rigorously to the restrictive assumptions of the formal theory which they are supposed to be testing or applying. Thus, there is obvious need for building more effective bridges between economic theory and managerial decision-making. . . ." (Case Western Reserve 1974, p. 4).

However, there was then (as now) the very different view espoused by Milton Friedman, namely, that whether the assumptions on which an economic theory—or, if you wish, a model—is built are "realistic" is at best irrelevant, at worst misleading: ". . . the relevant question to ask about the assumptions of a theory is not whether they are descriptively 'realistic,' for they never are, but whether they are sufficiently good approximations for the purpose in hand. And this question can be answered only by seeing whether it yields sufficiently accurate predictions" (Friedman 1953, p. 15).

There are, therefore, potentially two standards by which economists may assess the seven conference papers. First, do they develop richer models in the sense that they provide for a wider range of the phenomena generally encountered in the "real" world? And second, do they

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hold out the promise of yielding more accurate predictions? Whether these are in fact different standards depends on what sector of the microeconomy, in accordance with familiar neoclassical criteria, one has in mind. No one seriously doubts that when the conditions in the "real" world comport with those made explicit in models of pure or perfect competition, the models yield reasonably accurate predictions. The same may be said for monopolists unconstrained by near rivals or threats of new entrants, but with somewhat less confidence. However, in the unconstrained monopoly case, the source of such inadequacies as may persist in contemporary microeconomic theory lies not so much in the completeness of the models as in whether, for example, it is more realistic to assume that in the general case the monopolist pursues the goal of maximum profits à la Friedman, a sales maximization strategy à la Baumol, or a growth maximization strategy à la the Boston Consulting Group.

These observations, I trust, dissolve whatever mystery remains concerning the economic sector for which existing models are woefully inadequate. Models of oligopoly, whether of the moderately or highly concentrated variety, whether characterized by homogeneous or differentiated products, whether confronting confined or unconfined technological horizons, fail to meet either of the above standards: They do not handle the relevant variables firms confront in the real world, nor do they, with even modest consistency, yield satisfactory predictions.¹

This inadequacy of contemporary microeconomic theory takes on enormous importance in the light of the fact that a very large percentage of the GNPs of the United States and other private-enterprise industrialized countries is produced by multiproduct firms in markets whose structural features comport with some variety of oligopoly, in the sense that they are characterized neither by single-firm monopolies nor by atomistic competitors. As any recent text in industrial organization will confirm (see Scherer 1980, chap. 3), nearly one-half of the output in manufacturing is produced in industries with four-firm concentration ratios of 40 or greater, and over three-quarters of manufacturing output occurs in industries with ratios of 20 or greater. Most firms in such industries engage in complex strategies consisting of pricing, advertising, product differentiation, and selection of distribution channels and confront technological frontiers varying from highly con-

1. The general agreement among microeconomists on this point has been succinctly expressed by Paolo Sylos-Labini (1962, p. 82): "Equality of marginal revenue and marginal cost is a solution to the monopoly problem, not to the oligopoly problem where the main analytical difficulty concerns the treatment of the rivals' reactions. The objection against the marginalist solution is neither that it is not formally correct nor that it is irrelevant. The objection is that this solution is based on overly simple and, as a rule, unrealistic assumptions, and that, while having heuristic value for monopoly, is of no use in the problem of oligopoly."

strained to virtually unlimited. The precise components of the strategies they employ will be interactive with those of their rivals. Professor Vithala Rao lays this out quite adequately in Section II of his state of the art paper, where he describes the general framework for the price decision process.

As Professor Thomas Nagle emphasizes in the concluding section of his paper, "Economic Foundations for Pricing," "understanding the economic environment in which pricing decisions are made is a first step toward making them effectively." While he rightly identifies several marketing strategies (e.g., dealing, self-enforcing credible threat pricing, spatial competition, segmented pricing) for which economic theory has provided a beneficial foundation, he also points out that economic models fail to capture the full richness of practical pricing problems; hence, they set no prescriptions for solving them.

The five papers devoted to model building or model testing divide themselves into two distinct, but related groups: (1) firm-pricing models—Clarke and Dolan, and Katz; and (2) product-line or product-specific models—Oren, Smith, and Wilson; Goldberg, Green, and Wind; and Schmalensee. In the special case where the demand functions $Q^1(P^1)$ and $Q^2(P^2)$ in Schmalensee's bundling model and the arrays of leased machines in the Oren-Smith-Wilson model comprise the entire range of the firm's input, they may also be considered firm-pricing models.

To the extent one can give a general characterization of these papers, they seek to meet the "richer model" standard rather than Friedman's "satisfactory prediction" standard. Clarke and Dolan state this as the explicit objective of their computer simulation model SIMSTRAT. Their simulations incorporate dynamic cost and demand conditions from which are generated price and discounted-contribution paths for a monopolist that at some predetermined time confronts a competitor. The innovator, leader, or temporary monopolist is given the flexibility of pursuing alternative price strategies with the entrant, or follower, permitted passively to adopt the leader's price or aggressively employ his own (independent?) price strategy.

On the whole, the results are interesting and most of them permit economic interpretation. For example, a skimming strategy yields a greater discounted contribution when the follower is passive than when it is aggressive, the expected result since the leader is totally in command of price; skimming in most circumstances yields higher returns than myopic (short-run) profit maximization in each time period, a logical result of intertemporal price discrimination whereby the seller captures a portion of consumer surplus; and penetration strategies carry with them downward-falling cost curves because of the experience factor.

Clarke and Dolan's approach holds considerable promise for rem-

edying some inadequacies of existing competitive models, and by extending their analysis to the duopoly case, they have made a modest beginning in this direction. However, the interesting cases of actions and interactions by rivals remain to be developed.

Michael Katz's paper on competition among multiproduct firms and firm-specific differentiation also seeks to meet the richer model standard by incorporating a product premium variable into the profit-maximizing equation for multiproduct firms. Katz overstates the case slightly when he asserts that "competition in markets where each firm's products are related on the demand side have received much less attention (than when related on the cost side)." The conventional price equations for a multiproduct firm producing, say, product i and j are (Markham 1973)

$$P_i = \frac{dc}{dq_i} - q_i \frac{dP_i}{dq_i} \pm q_j \frac{dP_j}{dQ_i},$$

$$P_j = \frac{dc}{dq_j} - q_j \frac{dP_j}{dq_j} \pm q_i \frac{dP_i}{dQ_j}.$$

The cross-derivatives define the relationship between i and j on the demand side. When

$$\frac{dP_j}{dQ_i} = 0,$$

demands for i and j are independent; when

$$\frac{dP_j}{dQ_i} < 0,$$

i and j are complementary; when

$$\frac{dP_j}{dQ_i} > 0,$$

i and j are substitutes. Katz's analysis is concerned almost entirely with the multiproduct firm producing substitute products but employs a quality variable (q_{ij}) and a brand variable (b_i) to represent the "closeness" of product substitutability, rather than the conventional coefficient of price cross-elasticity. Consumers choose the variant of the product that yields the greatest consumer surplus, that is, the variant for which the perceived satisfaction minus its price is maximized.² Katz then extends his analysis to a duopoly situation with product differentiation across firms. The results are interesting and provide new insights into possible modes of competition among firms that produce variants of a given product line.

2. Total realized benefits less value of the stream of rental payments. Note the similarity of net user benefits with Katz's Consumer Surplus.

The pricing model developed in the Oren, Smith, and Wilson's paper, "Pricing a Product Line," although different in formulation, can be described broadly as an industrial marketing model counterpart to Katz's consumer product model. The lessor, with a line of machines of different quality (different operating costs per unit of output) that are partial substitutes for each other, confronts the problem of designing lease terms that will maximize profits. The lessee will choose a usage rate for any given machine i that maximizes its net benefit, $U(q_i, s) - R_i(q_i)$; and select from among available machines that machine yielding the maximum of the optimized net benefits, $U[q_i(s), s] - R_i[q_i(s)]$. The lessor achieves the benefits of market segmentation through the application of nonlinear pricing to determine a product's quantity discounts. The latter feature, as the authors claim, is their model's principal innovation. The principal shortcoming of the model as a managerial tool is that the solutions follow from the assumption of a nonrivalrous market environment, competitors' product lines and prices are assumed to be fixed, and no account is taken of their responses to the lessor's pricing and product strategy. This is a deficiency running through all five papers and one to which I shall return later.

I have fewer specific comments to make on the two "bundling" papers since the discussants have adequately covered their merits and shortcomings. Aside from the question raised concerning the appropriateness of the sample in Goldberg, Green, and Wind, I would like to offer a possible fundamental explanation, going beyond the method and the data, why results did not bear out the hypothesis that one's preference for a bundle of hotel amenities and their aggregate price could be predicted as a linear function of the respondents' part worths of the bundled components. Where products, or in this case amenities, are characterized by substitutability or complementarity, the sum of their individual worths may vary substantially and unpredictably from their bundled worths; for example, the atmosphere or facilities, though given a high value standing alone, might be given a much lower individual worth by a sports devotee when combined with either a swimming pool or tennis or racquetball court. This can be dramatically illustrated when we consider a guest contemplating the motel's dinner menu. He notes that the scampi is listed at \$13.50 and the pot roast at \$9.95. He places the individual worth of the scampi at \$10.00 and being especially fond of pot roast, values it at \$12.50.³ The sum of the individual worths is \$22.50. However, except for someone disposed to gluttony, a bundled price much greater than \$12.50 would not be an especially attractive bargain, unless of course, the guest could hold the unconsumed meal in inventory. Similarly, a guest who would spend a good

3. He obviously selects the pot roast, thereby reaping a consumer surplus of \$2.55.

portion of his wakeful hours in the pool might place a relatively low value on posh atmosphere. Without the pool, he may value it quite highly.

My principal reservations concerning the Schmalensee paper on bundling have to do with its economic relevance and managerial usefulness. At the theoretical level it is a veritable tour de force, an elegant extension of the previous work by Stigler and Adams and Yellen. The results are interesting and, not having unleashed the computer to solve for every contingency, he states them with appropriate qualifications. However, even the qualified results are relevant only for a perfect monopolist selling two commodities, the respective demands for which are strictly independent for all buyers (coefficients of price cross-elasticities of demand for $Q^1 [P^1]$ and $Q^2 [P^2] = 0$ for every buyer), and the reservation prices for Q^1 and Q^2 follow a normal distribution. The unlikelihood of finding these conditions in the "real" world do not detract from the elegance of Schmalensee's analysis, but it greatly limits the scope of its managerial applicability.

I opened my discussion with the general observation that the five papers on firm or product line pricing had the common feature of developing existing models into richer models; that is, they sought to incorporate a wider range of relevant variables in the models themselves. The efforts were productive in at least two ways: They serve to confirm the importance of pricing in the firm's overall decision-making process, and they point toward means of developing more effective pricing strategies. The single shortcoming of all the models is that they assume either that the decision-making entity enjoys unconstrained monopoly or that it confronts a competitor whose prices or products are given and remain fixed. The assumptions make possible neat and determinate solutions, but given the fact that most firms live in a dynamic economic environment characterized by actions and reactions by rivals in respect to multivariable marketing strategies, the models purchase determinateness at a substantial price. As a microeconomist who has had several occasions to review the state of economic theory in this area (see Markham 1968), I can assert with complete confidence that this is not a limitation confined to these models but is a characteristic of all existing microeconomic models. Perhaps the world of rivalrous oligopolies with available multifaceted strategies is entirely too complicated to capture in determinate models that at the same time yield reasonably reliable predictions. Nevertheless, the effort must be made. While I have no tested blueprint for the course such future research in the pricing domain might fruitfully take, I suggest that predictive as well as managerially useful models will require much greater empirical content. In any case, an extension of models such as those presented here to a more competitive environment might well provide the appropriate basis for the next pricing strategy conference.

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