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FULL COSTS, COST CHANGES, AND PRICES

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THE vigorous debate over full-cost and over theories which relate price changes to cost changes has brought about neither their rejection nor their general incorporation into received doctrine. When Hall and Hitch¹ in their report on the interviews with British businessmen by the Oxford Economists' Research Group attracted the attention of other economists to the theory of full-cost pricing, it was hailed by many as an original and practical theory of price determination. Actually it was not new, for in varied forms it had long occupied a place in business school texts and in the moralistic and expository statements of businessmen.² To the extent that economists were not aware of this pricing procedure,³ that indicated their ignorance if not disdain of "business" literature. But in the 1930's economists were in a more receptive mood for such heresy as the full-cost pricing idea. During those years of declining demand the flexibility of prices in the markets where sellers were numerous compared to the rigidity of those in concentrated industries called for explanation.⁴ At the same time developments in theory pointed to the indeterminacy of price in markets where sellers are few. The solution of that enigma which Hall and Hitch derived from their questioning of businessmen was that "in pricing they try to apply a rule of thumb which we shall call 'full cost.'"⁵ While this theory

¹ R. L. Hall and C. J. Hitch, "Price Theory and Business Behaviour," *Oxford Economic Papers*, No. 2, May 1939. Reprinted in T. Wilson and P. W. S. Andrews (eds.), *Oxford Studies in the Price Mechanism* (Oxford, 1951). Further references to this study will be to the reprinted volume.

² Indeed, a quite full exposition had been presented in 1924 by a businessman, Donaldson Brown, in his "Pricing Policy in Relation to Financial Control," *Management and Administration*, February 1924, pp. 195-198, 283-286, 417-422.

³ That is, in unregulated markets. In publicly controlled pricing, the building of prices on costs, as in the "fair return on fair value" tenet in public utility regulation, has long been accepted. Another example is "cost-plus" pricing of military goods. Somewhat analogous is the (average) cost-difference defense of price differences under the Robinson-Patman Act. The repeated attempts to require that maximum prices during the World War II and post-Korea crises be set on the basis of total costs, or of change in total cost from the date at which prices were frozen, indicate the hold of this doctrine on the business community.

⁴ That much of this difference, for various reasons, was more apparent than real, or that it might reflect differences in cost-change experience, need not detain us here.

⁵ Hall and Hitch, *op. cit.*, p. 113.

provided a rationale for the immunity of prices to demand changes when unaccompanied by cost changes, it did not gain wide acceptance as a substitute for orthodox marginal analysis. In the years since 1940 the relation of costs to pricing policies has been further investigated empirically⁶ and has been subjected to the close scrutiny of theorists.⁷ As a consequence parts of price theory have been re-examined and some economists would assign to full cost a definite role in economic doctrine.⁸

The task here is to appraise (1) the empirical evidence and (2) the theoretical significance of full-cost pricing and of other theories which at least appear to relate prices only to costs. Before this can be undertaken, the meaning of the full-cost doctrine must be delineated. Then the empirical evidence in support of such theories will be appraised; this will lead to some comments on research methods and needs. Whether or not empirical proof is established, the theoretical significance of the full-cost ideas will be explored. Some comments will be offered as to whether these ideas disprove or give empirical content to marginal analysis and some observations will be made about the empirical study of certain problems of oligopoly.

1. *What is Full-Cost Pricing?*

THE term "full-cost" pricing does not have precise meaning nor does it refer to a clearly delineated group of ideas about price determination. In part, this reflects an inevitable reduction of precision when theoretical and empirical work are blended or when disputants representing these two approaches enter into debate. In

⁶ E.g. C. C. Saxton, *The Economics of Price Determination* (Oxford, 1942), and R. A. Lester, "Shortcomings of Marginal Analysis for Wage-Employment Problems," *American Economic Review*, March 1946, pp. 63-82. Joel Dean, *Managerial Economics* (Prentice-Hall, 1951), pp. 444-450 and A. R. Oxenfeldt, *Industrial Pricing and Market Practices* (Prentice-Hall, 1951), pp. 156-164, give some support to this doctrine. Quite different in approach is A. C. Neal's *Industrial Concentration and Price Inflexibility* (American Council on Public Affairs, 1942).

⁷ E.g. Fritz Machlup, "Marginal Analysis and Empirical Research," *American Economic Review*, September 1946, pp. 519-554. William Fellner, *Competition among the Few* (Knopf, 1949), pp. 153-157 and 224-225, and "Average-cost Pricing and the Theory of Uncertainty," *Journal of Political Economy*, June 1948, pp. 249-252. E. A. G. Robinson, "The Pricing of Manufactured Goods," *Economic Journal*, December 1950, pp. 771-780. R. F. Kahn, "Oxford Studies in the Price Mechanism," *Economic Journal*, March 1952, pp. 119-130. Tibor Scitovsky, *Welfare and Competition* (Irwin, 1951) Chap. XIII. E. H. Chamberlin, "Full-Cost and Monopolistic Competition," *Economic Journal*, June 1952, pp. 318-325. R. F. Harrod, *Economic Essays* (Harcourt, Brace, 1952) pp. 157-174.

⁸ Notably Fellner, Scitovsky, Chamberlin, and Harrod, in above citations.

part, also, it reflects the mixing of two analyses: the level of equilibrium price and the conditions of change of price—a mixing which has been usual in other theoretical analyses but of questionable value in oligopoly analysis, as Sweezy pointed out.⁹ It is particularly so where the analysis is approached empirically. For these and other reasons, further analysis will be facilitated by exploring assumptions, clarifying terminology, and indicating the variety of theories which fall under, or are akin in important attributes to, the full-cost principle. This will mean that the discussion will include more of recent price theory than the term “full cost” may connote.

Stated briefly, but in a form which involves the essential attributes of many variations of the idea, the full-cost principle holds that the firm (s) set its (their) prices with regard only to total unit costs at some assumed volume rate.¹⁰ As such the theory is a direct challenge to two tenets of generally accepted economic theory; i.e. (1) that demand as well as supply conditions, or costs, enter into price determination (for which Marshall used the “two blades of the scissors” analogy); and (2) that the rational solution of all price problems requires the equating of *marginal* revenue and *marginal* cost.¹¹ Whether the heresy is as great as it appears, particularly in Harrod's formulation, will be clarified by exploring the following topics: (1) meaning of “full cost,” (2) short-term pricing, (3) price setting or price changing, (4) influence of demand, (5) full-cost or gross-margin pricing, and (6) types of markets.

MEANING OF “FULL COST”

CONTRASTING the term “full cost” with marginal cost does not explain adequately the meaning of the former. The idea implies average cost, for it includes variable and fixed costs. Whether a profit is considered as a cost, or as part of a gross margin added to part or all of direct costs, or is specifically included as a net margin above costs, a return on investment is part of the pricing formula.¹²

⁹ Paul M. Sweezy, “Demand Under Conditions of Oligopoly,” *Journal of Political Economy*, August 1939, pp. 572-573.

¹⁰ It makes no difference whether “normal” profit is considered to be added to a cost or to be itself a cost. Indeed, it is often included in a gross margin over part or all of direct cost.

¹¹ In contrast to marginal analysis, full-cost pricing is full-unit-cost pricing without regard to demand. Viewed from the usual theoretical framework, it could result in a price that maximizes profits only by accident, not by design.

¹² Indeed, the profit rate may be computed as that which will yield a target rate of return on investment at normal volume. The procedure is described by

Since most firms are multiproduct, the accountants' allocation of common costs, and of costs distributed over time as well, are accepted at face value. Or differential margins over direct costs (which have evolved out of some complex of common cost allocations and the intensity of competition in the sale of various products¹³ or items) may be used in arriving at full cost.

But these parts of the definition leave unsettled the impact of factor prices and of volume rates on costs under given technology. The average total cost could be that experienced historically, or expected, or considered "normal." Ordinarily, either present or expected prices of important factors are used. But the impact of volume rate on conversion or handling costs per unit is either assumed to be nominal or is disregarded by assuming an average or "normal" volume.¹⁴ In a few cases reference is made to expected volume; indeed Harrod's argument involves the assumption of a plant scale reflective of expected average volume at a full-cost price.¹⁵ With this exception, and with particular reference to those who relate full-cost to short-term pricing, the doctrine disregards the possible impact of the level of price set on volume and hence on unit costs. The reasoning is a one-way street from costs to price, with no reverse influence.

SHORT-TERM PRICING

FULL-COST pricing is used by many writers as a short-term price theory.¹⁶ This is not short-term in the formal sense of cases in which

Dean (*op. cit.*, pp. 448-449) and an elaborate application shown in Homer Vanderblue, "Pricing Policies in the Automobile Industry," *Harvard Business Review*, Summer and Autumn, 1939.

¹³ Note how the cost formula itself comes to incorporate demand influences, a fact which becomes increasingly evident in the following pages.

¹⁴ This is typically the volume rate assumed in the "standard cost" system of the firm or a cost system which provides norms for testing operating efficiency or for making choices between alternative uses of facilities. Saxton (*op. cit.*, pp. 52-53) found that among the British firms he surveyed the most typical view was that 80 to 85 per cent of capacity constituted "normal" volume. On the basis of his study of American practice, Dean suggests that 75 per cent is regarded as normal.

¹⁵ Harrod, *op. cit.*, pp. 160-161.

¹⁶ This seems to be an appropriate interpretation of Dean's explanation (*op. cit.*, pp. 145 and 149) and is pointed out specifically by Saxton (*op. cit.*, pp. 29-37). The short period is also the center of attention of Hall and Hitch (*op. cit.*, pp. 109, 120-122, and 124). This deduction rests in considerable part on the fact that while they emphasize the competitive influences on the size of the margin between direct costs and prices this margin is assumed not to change in the short run. On the other hand, Harrod (*op. cit.*, pp. 159 ff.) seems to look upon full cost as a long-term principle.

the firm's plant and equipment remain unchanged. Instead the reference is to pricing for a specific contract, for a planning or budgeting period, or for a season or model period. Even more clearly these doctrines deal with the change of price from its pre-existing level.¹⁷

PRICE SETTING OR PRICE CHANGING

THE full-cost doctrine and the related ideas examined here appear as explanations both of the level of the price for a commodity at a given time and of the conditions under which that price will or will not be changed. Sometimes this distinction is not made clearly, as if it were not important.¹⁸ Theorists particularly are inclined to disregard the distinction. The setting of prices in the strict meaning of the term is not an important part of the pricing problem.¹⁹ What most people mean by price setting is the procedures and forces by which the existing level of price was determined. For Hall and Hitch concluded: "The height of price . . . is determined on the 'full cost' principle. . . ." ²⁰ Harrod argues that the firm will plan its plant size to be that which at optimum operating rate, the output can, on the average of good times and bad, be sold at a full-cost price.²¹ Andrews has a statement which except for the reference to plant scale amounts to the same when he says "that the price which a business

¹⁷ Andrews' theory reverses the emphasis, however. He is concerned primarily with the long-run price, which he finds to be equal to direct costs plus a competitively determined gross margin. Then, in the short run, prices change only with movements of direct costs or under extreme circumstances by a larger amount when adherence to the gross margin breaks down. Thus Andrews' theory becomes one of the dominance of long-term considerations over short-term conduct. For details see his *Manufacturing Business* (Oxford, 1949).

¹⁸ Dean refers to "Surveys of actual business practice in setting prices" (*op. cit.*, p. 444) and to price setting for "specifically designed" goods (p. 445). Presumably he would include price changes according to cost changes in what he calls "cost plus" pricing. Oxenfeldt (*op. cit.*) deals explicitly only with price setting.

¹⁹ J. T. Dunlop and E. M. Martin in their study of the International Harvester Company report: "Consideration of prices for most items . . . centers around changes from established levels. A decision not to change a quoted price in some circumstances where the market situation has changed radically may be as significant a decision as one in which an important price change is made. Only in those instances where a complete new line, such as a new tractor, is introduced, is it necessary to consider the price of an implement *de novo*." (D. V. Brown and others, *Industrial Wage Rates, Labor Costs and Price Policies*, Temporary National Economic Committee, Monograph 5, 1940, p. 80.)

²⁰ Hall and Hitch, *op. cit.*, pp. 122-123. Later we shall refer to their hastily added modifications of this principle.

²¹ Harrod, *op. cit.*, pp. 159-161.

will normally quote for a particular product will equal the estimated average direct cost of production plus a [gross or] costing-margin."²² Such rules are most often used to explain that prices will change ordinarily when factor prices move. On the other hand, it is agreed that selling prices will ordinarily not reflect demand variations unassociated with, or greater than, factor price movements.²³ For this reason the analysis here is broadened to include investigations which are directed solely to the price change problem, such as that of A. C. Neal.²⁴

THE INFLUENCE OF DEMAND

BUT further consideration of these cost explanations of prices shows that the cost rules themselves contain, or in application are modified for, demand influences. In direct relation to the height of cross elasticities of demand among rivals' products, the gross margin used by the individual firm reflects not its own indirect costs but rather the margin it finds by experience to be desirable in light of costs and market conduct of its rivals. For longer-term pricing, Harrod specifically refers to the firm's long-term demand curve, which he assumes to be quite flat.²⁵

Once the price exists, all proponents of the cost-to-price theories agree that price will not be changed because volume rises or falls moderately, except when a rival decreases the price first. Otherwise, the benefits of favorable demand will be enjoyed in the form

²² Andrews, *op. cit.*, p. 184. Andrews does not consider this to be "full cost" for reasons to be given below.

²³ Hall and Hitch say on page 124: "This does not mean that there will be no tendency for the prices of these goods to fall in depressions and rise in booms, but simply that there will be no tendency for them to fall or rise more than the wage and raw materials cost." Andrews says that the manufacturer will "maintain his price so long as his costs [direct costs plus costing margin] remain unchanged." He states also: "The manufacturer will not willingly cut his price, *apart from the extent to which it will reflect cost changes*, when markets are weak and demand is falling" (*op. cit.*, p. 180. Italics supplied).

²⁴ Neal, *op. cit.*

²⁵ Harrod, *op. cit.*, p. 160. The last part of the incomplete sentence from Hall and Hitch quoted above reads: ". . . conditioned by such historical accidents as (a) the size and efficiency of the firms in the industry at the time price stability was achieved, and (b) the extent of their optimism and of their fear of potential competitors as measured by the percentage addition for profits" (*op. cit.*, p. 123).

Andrews repeatedly warns of the competitive influences on the size of the "costing-margin," or the gross margin between direct cost and price. For example, "The costing-margin, and with it the business man's price, will thus be arrived at by competition . . ." (*op. cit.*, p. 159).

of the larger volume, for price is assumed to be above marginal cost, at least until the output rate rises to the point that "stressing of the plant" develops.²⁶ On the other hand, the impact of lower sales, at least down to a point where the firm's financial security is threatened, will be minimized by a drive for cost-cutting and by cost deferment. Beyond that, losses will be absorbed out of profits.²⁷ But there are limits to this immunity from short-term, industry-wide demand movements. Thus Hall and Hitch found that, of the firms interviewed, there were "a few admitting that they might actually charge more [than "full cost"] in periods of exceptionally high demand, and a greater number that they might charge less in periods of exceptionally depressed demand."²⁸ Similarly, Vanderblue, after describing General Motors' elaborate cost-plus price computations notes: "This price, once set, must stand the test of the market place in competition with cars produced by other companies. Merely having a cost guide to judgment does not assure that the market will pay a price that will return this cost (plus a profit), however carefully the cost analysis has been made. . . . In practice the final quoted or *Prevailing Price* has generally been below *Standard Price* [full-cost price] and only occasionally above."²⁹

FULL-COST OR GROSS-MARGIN PRICING

MUCH of what is called full-cost pricing, or cost-plus pricing, and most of the analyses which relate price changes to cost changes could better be termed "gross-margin pricing." Generally, this gross margin above direct costs is not related to the remaining costs of the firm. As already noted, Andrews considers the size of such margins to be a function of rivals' costs, but other writers take such margins as data which require no explanation.

Application of the same margin to a number of products has been stimulated by the common-cost allocation problem. In addition, the facility with which repetitive pricing problems can be handled, once the gross margin is adopted, explains its wide use not only in the distributive trades³⁰ but also in manufacturing where the variety of items is great and in constant flux. It is also used in

²⁶ Saxton, *op. cit.*, pp. 103-104.

²⁷ Saxton elaborates the cushion role of profits (*ibid.*, pp. 131-132).

²⁸ Hall and Hitch, *op. cit.*, p. 113.

²⁹ Vanderblue, *op. cit.*, pp. 396 and 397.

³⁰ This is stressed as an aspect of "cost-plus" pricing by Oxenfeldt (*op. cit.*, pp. 157-164) and presumably would be included in Fellner's discussion of markup pricing (*op. cit.*, pp. 154-155).

the thin-margin agricultural processing industries, which experience frequent and wide movements of raw materials prices.⁸¹ A more general application is to relate product price movements throughout the manufacturing industries to movements of prices of factors which enter into direct cost. This explanation of price change runs through the work of the Oxford Group and is the major point made by Neal.

TYPES OF MARKETS

THE structure of the markets and the relationship found among sellers, while a fundamental part of such doctrines as those examined here, are frequently not discussed explicitly. There is a strong tendency to speak of the firm as "setting its price," as though every firm were a monopolist. But when other parts of the discussion are considered, there is reference to rivals' reactions.

The writers in this field seem to have had a variety of market situations in mind. Hall and Hitch were studying oligopolistic markets primarily, but they did not differentiate definitely between respondents who were parties to price agreements and those whose relation to rivals was that of "quasi-agreement," to use Fellner's term. Thirteen of their thirty-eight respondents were members of "large-numbers" industries.⁸² Saxton identifies the dominant price-leader cases⁸³ and trade association price-fixing activities.⁸⁴ Andrews does not follow the customary classification of markets but is concerned with cases in which "an established business will have a more or less clearly defined market, and will be protected from the efforts of would-be competing businesses to cut into that market."⁸⁵ Harrod states specifically that he is not concerned with markets where oligopoly is present, but with those in which entry is so easy that sellers cannot for long charge more than full cost.⁸⁶ Dean does not specify the types of markets but his illustrations cover a wide range of situations. Oxenfeldt also seems to have a number of types of markets in mind but draws most of his illustrations from the distributive trades where sellers are numerous.

With full-cost and cost-change price theories being applied to such a variety of markets it will be necessary at points in the fol-

⁸¹ Indeed, the whole concept of hedging against raw material price movements in these industries is based on the assumption of a similarity of movement of those prices and of the prices of the products made from them.

⁸² Hall and Hitch, *op. cit.*, p. 119, Table 6.

⁸³ Saxton, *op. cit.*, p. 125.

⁸⁴ *Ibid.*, p. 12.

⁸⁵ Andrews, *op. cit.*, p. 153.

⁸⁶ Harrod, *op. cit.*, p. 161.

lowing sections to make clear the type of market to which the discussion refers.

PLAN FOR FOLLOWING ANALYSIS

IN THE sections which follow we shall be concerned with ideas which hold that prices are established at the level of (or are changed or not changed) according to the level (or change or non-change) (1) of some type of average total costs or (2) of a gross margin over direct costs. While it is implicit in all of these theories that prices stem directly from sellers' decisions and do not emerge from impersonal market processes, the emphasis is not on "setting prices" but rather on the level which emerges from a whole series of decisions as to whether or not to change prices. Whether or not particular theories surveyed can be properly denoted "full cost" will not be of concern.

The empirical evidence and the theoretical significance, if any, will be reviewed with respect to each of the following topics:

1. The relation of costs to output rate as shown by empirical evidence and as viewed by managements.
2. Full cost and the level of price under oligopoly, both when overt collusion is present and when it is not.
3. Cost formula or gross margin pricing in the distributive trades and in manufacturing where frequency of product change or variety of items produced call for numerous price decisions.
4. Price effects of factor price and demand changes which involves a generalized explanation of the impact on prices of movements of direct costs.

2. The Relation of Costs to Output Rate

NUMEROUS assumptions as to the relation between volume rate and unit costs underlie the various theories being considered here. A typical assumption (sometimes made explicitly) is that, within the output range relevant for short-term pricing, the marginal cost curve is quite flat.⁸⁷ The reference may be to a cost-output relation analogous to the economist's static cost function. Or, as we shall see, the view of the cost-output relation may stem from an expected concomitance between output changes and non-static factors which influence the level of costs. Then, where the assumption of horizontal marginal costs is not made explicitly, it is clear that the cost

⁸⁷ Harrod makes this point most emphatically (*op. cit.*, p. 154 and Figure 2 on p. 170).

changes with volume changes are not considered to be of sufficient magnitude to outweigh the advantages of a price based on cost at one assumed volume rate, usually at some concept of a "normal" rate.

EMPIRICAL EVIDENCE ON COST FUNCTIONS

THERE is now significant evidence to the effect that, in manufacturing operations at least, marginal costs do not vary for a fairly wide range of output rates. The area of flatness of marginal costs extends downward from the neighborhood of the output for which the plant was designed to as much as 30 per cent below that point. That marginal costs are horizontal in this range has been demonstrated almost without exception in statistical investigations of cost experience³⁸ and has been supported in a number of studies of expected effects of volume on costs as derived from accountants' and engineers' cost estimates.³⁹ Saxton concludes on the basis of discussion with entrepreneurs that: "There is a range of output starting from a point as much as 10 per cent or 15 per cent below 'normal' output to a point as much above 'normal' output, over which marginal cost is fairly constant."⁴⁰ Nicholls finds that there is no significant evidence for other than a linear relation between labor inputs and output in meat packing.⁴¹ Andrews' investigations lead him to conclude that average direct costs are constant over a wide range of output because business finds that favorable and unfavorable influences associated with volume changes tend to offset each other and hold direct costs constant.⁴²

MANAGERIAL VIEWS OF COST-OUTPUT RELATIONS

INDEED, it is such a mixture of static forces and expectations of con-

³⁸ For references to these investigations and a summary and critique of the findings, see: Committee on Price Determination, Conference on Price Research, *Cost Behavior and Price Policy* (National Bureau of Economic Research, 1943), pp. 81-101 and 109 and Hans Staehle, "The Measurement of Statistical Cost Functions: An Appraisal of Some Recent Contributions," *American Economic Review*, June 1942, pp. 321-333. For a more extensive presentation of a number of these studies, see Joel Dean, *Statistical Determination of Costs with Special Reference to Marginal Costs* (University of Chicago Press, 1936). For a briefer exposition and some additional cases, see Dean's *Managerial Economics*, as cited, pp. 272-296.

³⁹ Summarized in *Cost Behavior and Price Policy*, as cited, pp. 101-102.

⁴⁰ Saxton, *op. cit.*, p. 96.

⁴¹ W. H. Nicholls, *Labor Productivity Functions in Meat Packing* (University of Chicago Press, 1948), p. 24.

⁴² Andrews, *op. cit.*, pp. 102-109.

currence between volume changes and cost-influencing events which dominate managerial notions about the relation of operating rate to costs. Managements note the relation between volume changes and the individual efficiency of workers, the attentiveness of supervisory personnel to their tasks, and the general alertness or carelessness about costs.⁴³ It is observed that larger volume and the ability to delay deliveries and still keep the business, affect the length of runs and hence, by tending toward lower costs,⁴⁴ work in opposition to reduced individual efficiency of workers. The quality and prices of factors generally, not merely of labor, are often correlated positively with output rate. Clearly, the view of managements in respect to cost-volume relationship involves a mixing of static and other considerations.⁴⁵ It is not necessary here to enter into the debate as to whether particular cost-influencing factors are static or otherwise. Our concern is with management's views of the problems.

Management's conclusions on the relation between volume rate and costs seem to reflect the variety of conditions under which they experience stable or rising costs. Getting more volume than that for which the plant was designed is recognized as possible, but not ordinarily by adding small increments of such variable factors as labor. Instead, it is accomplished by postponement of normal shut-downs for cleaning or for repairs and by putting normally idle, inefficient units into operation. Actually, businessmen appear to relate rising costs at higher output rates to lower quality of factors⁴⁶ or higher price for them, both of which reflect the high level of demand for factors. Such costs will be incurred to meet orders of valued customers, to meet war demands, or to face similar situations; but these conditions of rising marginal costs are beyond the range of output for which short-term, price-output plans are ordinarily made.⁴⁷

⁴³ The present writer has frequently found the response to the question, "What do you do when sales volume falls off?" to be "We get busy on our costs."

⁴⁴ *Cost Behavior and Price Policy*, as cited, p. 84. In the present writer's judgment, this explains much of the increased output per man in such industries as textiles, steel, and rubber tires between 1939 and 1942.

⁴⁵ This is the way Saxton (*op. cit.*, pp. 101-102) analyzes the problem without specifically pointing to the difference between the two concepts of marginal costs. The Committee on Price Determination (*Cost Behavior and Price Policy*, as cited, p. 113) recognizes the difference but recommends the usage which reflects the effects of both static and other influences.

⁴⁶ This may affect wastage of material or percentage of product failing to pass inspection. These were two major causes of rising costs during the war in metal-working firms who appealed to the Office of Price Administration for price relief.

⁴⁷ Andrews (*op. cit.*, pp. 109-110) contends that such "extraordinary" costs do not enter into pricing.

The difficulties faced in cost accounting and the practices adopted, as typified by "standard cost" systems, contribute to a horizontal view of marginal costs and to the quoting of a single total cost figure by management.⁴⁸ In such systems direct costs are computed by multiplying "standard" physical inputs of direct factors per unit of output by prices of factors. Sometimes part of indirect costs are assigned in a similar fashion. All unassigned costs are included in a "loading factor," which is computed from an estimate of what these costs would be for a group of products or for the enterprise as a whole at a "normal" volume. Often the loading is translated into a percentage of part or all of direct costs at the "standard" volume rate. Consequently neither direct costs nor overhead costs are analyzed as dependent on actual or expected volume but on "standard" volume. Of course managements are fully aware of the spreading effect of higher volume on unit overhead costs; the addiction to price discrimination attests to this. But the horizontal view of the direct cost curve remains.⁴⁹ Corollarily, direct costs are presumed to change by the amount that factor prices move. Because total costs are typically estimated by a percentage add-on to direct costs, total costs also are presumed to change in proportion to factor price movements.⁵⁰

The break-even charts, which are so popular in business circles,⁵¹ show unit variable costs as constant over a range from near zero to 100 per cent of "capacity," and fixed costs per unit of product as falling along a straight line.⁵² Such rigidity of classification of costs into fixed and variable costs outdoes economic textbooks in misrepresenting the facts about costs. Right or wrong, these charts portray businessmen's thinking and particularly their assumption that unit variable costs do not change with volume. For our purposes the conclusion seems clear that there is a substantial volume range within which marginal costs, particularly as viewed by managements, are approximately constant, given constant factor prices.

⁴⁸ Relevant attributes of "standard costs" and their relation to management's appraisal of operations, but not their limitations as a guide to pricing, are explained succinctly by W. W. Cooper, "A Proposal for Extending the Theory of the Firm," *Quarterly Journal of Economics*, February 1951, pp. 87-109.

⁴⁹ Scitovsky (*op. cit.*, pp. 309-314) incorporates this conclusion into price theory.

⁵⁰ Anyone who participated in wartime price fixing realizes the strength of this business belief.

⁵¹ See *Cost Behavior and Price Policy* (as cited, pp. 104-108) and Dean (*op. cit.*, pp. 326-338), who refers to charts for particular enterprises.

⁵² That these charts do show total costs as falling with volume is not inconsistent with what was said about standard costs, for the latter disregard volume changes. Actually, break-even charts are not used primarily for price setting but for showing impact of different prices or of volume rates on profits.

The theoretical significance of constancy of marginal costs lies in its relation (1) to the conditions of equilibrium and (2) to what happens to prices when demand changes.

1. Presumably the barrier to an indefinite increase of output and reduction of prices lies in the fact that marginal costs do rise when output is pushed beyond the range ordinarily involved in pricing. While some recognition of this fact was noted above, this appears only as a general limit on competitive maneuvers. Managements policies are interpreted as designed for a "normal" volume short of this point.

2. As long as the firm's demand moves within the range in which its marginal revenue curve intersects the horizontal segment of the marginal cost curve, the level of that intersection does not change. Whether or not the price at which that quantity could be sold does change depends on whether the firm's revenue curve retains the same elasticity as it shifts.

3. *Full Cost and the Level of Price under Oligopoly*

DETERMINATION of where an oligopolistic price will fall between the upper limit of that of a monopoly and the lower limit of a competitive equilibrium was the objective of the study from which the full-cost pronouncement first appeared. Probably most persons still look upon the full-cost doctrine as a guide to how the level of the price is determined, although, as observed above, attention has veered toward the cost-change problem. But an exposition which runs in terms of conduct of one firm involves the problems of what happens when rivals' costs or other relevant attributes differ. This difficulty hounds the full-cost disciples as it has those who offer other approaches to a theory of oligopoly price.

THE EMPIRICAL EVIDENCE

RARELY has so much debate been set off by a proposal for which such meager supporting evidence has appeared. Hall and Hitch summarized the interviews with a nonrandom sample of thirty-eight businessmen, a substantial portion of whom confessed that they did not adhere, or adhered only under favorable demand conditions, to the full-cost principle.⁵⁸ In Saxton's study of fifty firms by questionnaire, thirty-six said they fixed prices on standard or on estimated

⁵⁸ It is understood, however, that their conclusions were based upon a much more extensive program of discussion with businessmen and unpublished studies of particular industries by the Oxford Research Group.

costs,⁵⁴ but he found the answers to questions as to how demand considerations affected prices to be so varied that results were not tabulated. Dean concludes from his unpublished studies that "a majority of businessmen set prices on the basis of cost plus a 'fair' profit percentage."⁵⁵ Published studies of particular companies⁵⁶ and of the metal-container⁵⁷ and rayon⁵⁸ industries give credence to pricing on full cost. In two recent analyses of the cigarette industry, Tennant asserts that "Prices appear to be set on some principle of markup over cost. . .,"⁵⁹ but one does not find a similar conclusion in Nicholls.⁶⁰ Nor does full cost appear as an explanation of price performance in extensive studies of industries which rank quite high in concentration such as newsprint,⁶¹ Pacific Coast petroleum refining,⁶² and farm machinery,⁶³ or in briefer reports on industries which are much less concentrated, such as those making shoes⁶⁴ and textiles.⁶⁵

The fact that questionnaire and interview surveys covering a number of industries have often led to full-cost pricing conclusions, while full-blown studies of particular industries usually have not, calls

⁵⁴ Saxton, *op. cit.*, p. 181, question 19.

⁵⁵ Dean, *Managerial Economics*, p. 445. Dean refers here only to manufacturing businesses operating under conditions of oligopoly or a high degree of product distinctiveness.

⁵⁶ See p. 367 above with respect to Vanderblue's report on General Motors. Oxenfeldt (*op. cit.*, p. 181) cites a similar policy statement by a Ford official. Price decisions in these cases are clearly tempered by current and prospective demand.

⁵⁷ In this industry five-year contracts (used before the recent antitrust decision) provided tin can prices at a specified margin above future announced prices of tin plate. C. H. Hession, *Competition in the Metal Food Container Industry 1916-1946* (privately printed, 1948), pp. 223 ff.

⁵⁸ Jesse W. Markham (*Competition in the Rayon Industry* [Harvard University Press, 1952]) specifically denies the existence of a full-cost policy (pp. 187-190) but the evidence he quotes has to do with year-to-year relations between total unit cost and prices. The same evidence which shows stability of the unit profit margin from 1931 to 1940, except for high- or low-volume years, may in fact indicate a policy of pricing on full cost at some normal or average volume.

⁵⁹ R. B. Tennant, *The American Cigarette Industry* (Yale University Press, 1950), p. 364.

⁶⁰ W. H. Nicholls, *Price Policies in the Cigarette Industry* (Vanderbilt University Press, 1951). The summary of price policies appears in Chaps. XIII and XIV.

⁶¹ J. A. Guthrie, *The Newsprint Paper Industry* (Harvard University Press, 1941), especially pp. 106-120.

⁶² Joe S. Bain, *The Economics of the Pacific Coast Petroleum Industry* (California University Press, 1945), Vol. II, especially pp. 285-298.

⁶³ Dunlop and Martin, *op. cit.*, pp. 80-97.

⁶⁴ *Ibid.*, pp. 15-22.

⁶⁵ *Ibid.*, pp. 50-53.

for a comment on methods of investigation. The inherent weaknesses of the questionnaire method have been emphasized elsewhere.⁶⁶ That businessmen's responses to questions about their policies are taken at face value without definite checking as to their conduct is disconcerting. But more basic is the question as to whether price determination can be studied by any method that short-cuts a deep understanding of the particular market.⁶⁷ Managements rarely meet the simple question of how cost or demand affects price. Questions and answers are out of context unless they are considered as part of the complex in which the firm and industry operate. Even such elementary concepts as "product" may be vague otherwise, and often the relevant data, which are rarely up to the statistician's dream, cannot be handled judiciously without such a background. Consequently, with survey results supporting to some degree, but intensive studies of industries not corroborating, it seems best to conclude that the wide use of full cost in determining the level of price under "quasi-agreement," as distinct from formal collusion, has not been demonstrated.

WHOSE COSTS ARE APPLICABLE

A MAJOR problem in a noncollusive oligopoly is that of how two or more rival firms with different costs can, in fact, price on a full-cost basis. This problem is not always recognized, and where it is, the solutions offered are diverse. Hall and Hitch, except where rivals' costs are similar, fall back on a price leader's use of full cost;⁶⁸ or they state that "the effect of 'competition' " is "to induce firms to modify the margin for profits which could be added to direct costs and overheads so that approximately the same prices for similar products would rule within the 'group' of competing producers."⁶⁹ Except insofar as the margins so determined are then applied to other products, this is not full-cost pricing in the sense of the determinant of the level of price. Indeed, the somewhat different and more elaborate analysis of Andrews is not full-cost in this sense either, for he repeatedly emphasizes the competitive determination of the gross margin over direct costs.⁷⁰ Saxton seems to conclude that in all industries which depart very far from the competitive

⁶⁶ E.g., by Machlup, *op. cit.*, pp. 536-538.

⁶⁷ J. S. Bain thinks not ("Price and Production Policies" in H. S. Ellis [ed.] *A Survey of Contemporary Economics* [Blakiston, 1948], pp. 163-165).

⁶⁸ Hall and Hitch, *op. cit.*, p. 120.

⁶⁹ *Ibid.*, p. 113.

⁷⁰ Andrews, *op. cit.*, pp. 145-204.

model either price leadership or various degrees of collusion exist.⁷¹ Tennant does not explain how the differential cost problem is solved in the cigarette industry, but a pattern of differential margins does develop and price changes to correct a margin change must be initiated by a price leader.

PRICE LEADER'S USE OF FULL COST

INDEED, the full-cost idea as an explanation of a price leader's conduct is quite persuasive, although again the empirical evidence is sparse. Reference here is to the "dominant" rather than the "barometric" price leader, for the latter has to do with price change in response to factor price or demand movements. The dominant leader must fix a level of price, relative to costs primarily, to which other sellers will adhere because it is to their advantage or because of fear of consequences of noncompliance. Such a price leader needs an objective guide and his own costs are the major ingredient of such a guide. The net margin must reflect the level of prices which will hold lesser rivals in line and discourage disruptive entry. This is another way of saying that the dominant firm's own costs, or even that of a noncolluding oligopolist, is the best guide to the long-run demand of the firm.⁷² Dean describes a convincing case of this sort,⁷³ and Saxton stresses similar situations⁷⁴ but seems to find that consultation usually strengthens the leadership.⁷⁵ The fact that the market share of the price leader usually falls⁷⁶ indicates a tendency to err on the high side in fixing prices.

FULL COST PRICING UNDER COLLUSION

EVEN more persuasive is the role of full cost in collusive arrangements. Although the evidence is scattered, it appears with respect to so many diverse arrangements and its logic is so clear that firm conclusions can be reached. Saxton concludes that full cost guides British trade association price policies operating in the absence of governmental prohibitions.⁷⁷ Hall and Hitch had referred to the publication of standard costs by such associations and stated that "firms in the industry were urged to use the 'standard' costs in ap-

⁷¹ Comments of this sort appear at several points in his chapter on "Price Fixing and Price Policy."

⁷² Machlup, *op. cit.*, pp. 543-546.

⁷³ Dean, *Managerial Economics*, pp. 439-442.

⁷⁴ Saxton, *op. cit.*, pp. 129-130 and 139-144.

⁷⁵ *Ibid.*, p. 126.

⁷⁶ A. R. Burns, *Decline of Competition* (McGraw-Hill, 1936), p. 142.

⁷⁷ Saxton, *op. cit.*, pp. 139-143.

plying the full cost principle."⁷⁸ Similar efforts toward pricing on the basis of the average of the full costs of rival firms have been made by American trade associations within the narrower limits imposed by the antitrust laws.⁷⁹ The rush to full-cost pricing when those laws were suspended during the days of the National Recovery Administration and the incorporation of the average of full costs of the region into bituminous coal price fixing under the Bituminous Coal Act of 1937⁸⁰ show the attraction to this guide when agreement is possible.

The significance of full costs as a guide to the determination of the level of price goes beyond cases of overt agreement. The literature on "quasi-agreement" and the realistic emphasis on consultation of the sort not detectable directly by the antitrust agencies have amplified the area to which such a tangible, workable guide to similarity of price conduct as full cost is applicable. Thus, although the industries involved in recent basing point cases have been found guilty of "implied conspiracy" because of identity of delivered prices and the imperviousness of those prices to changed market conditions, the evidence does not show the guides by which the price level was determined. But one can suspect that something akin to full cost was involved.

HARROD'S MODEL

WHILE Harrod's quite complete and explicit model of full-cost pricing does not, as he develops it, fall in the present section, it can be fitted in easily. He has in mind a producer of a differentiated good whose main concern is with preventing entry. That is analogous to the price leader's problem both as to entry of new sellers and as to shares of established sellers.

The keys to Harrod's model are: (1) Plant size and type are not those which yield maximum economies of scale, but those which have lowest cost for an output rate which, on the average, can be sold at a full-cost price. (2) Short-term marginal costs are constant over the range within which volume would ordinarily fluctuate. (3) In its price policy (both long-term and short-term) the firm considers only its long-term revenue curve. At quantities less than that which the plant was designed to produce, the long-term demand

⁷⁸ Hall and Hitch, *op. cit.*, p. 113, note 2.

⁷⁹ Burns, *op. cit.*, pp. 45-74.

⁸⁰ D. H. Wallace, *Economic Standards of Government Price Control*, Temporary National Economic Committee, Monograph 32, 1941, pp. 274-298.

curve is considered to be close to horizontal at a price equal to full cost. This is the price which would discourage entry.

Putting these ingredients together, Harrod finds an equilibrium at full cost with the long-term demand tangential to the average cost curve of the plant actually built. This leads to the conclusion: "So long, therefore, as we are subject to the proviso that the entrepreneur dare not charge a price above full cost without rendering his market vulnerable, the 'full-cost' criterion gives the same answer as the marginal criterion."⁸¹

Aside from the presumed greater stability of the equilibrium and the lack of excess capacity, which stem from designing the plant at less than the economic optimum scale, the whole of this argument rests on forestalling entry. Thus, the full-cost argument becomes that of using one's own costs as a guide to the level of price maintainable over a long period, and of using this as a guide to short-term as well as to long-term policy.

Once, however, one admits close rivals into the analysis (as Harrod must), there arises the question raised repeatedly here as to whether firms plan that way, or whether varied cost-price relations for the various firms develop on the basis of experience. The presence of rivals, and of interaction among them, cannot be avoided for most important situations.

SUMMARY

THE conclusion which emerges is that full cost as a determinant of the level of price is most significant where the market structure approximates a pure oligopoly. In such cases price decisions involve collusion in the sense of a high degree of "conjectural interdependence" typically aided, perhaps, by consultation.

4. *Cost-Formula or Gross-Margin Pricing in Repetitive-Pricing Operations*

IN A number of manufacturing industries and in the distributive trades generally, the variety of items sold or the frequency of change in what is sold requires that many price or output decisions be made. Typically some kind of formula is adopted as a procedure in which part or all of direct cost at current or expected factor prices constitutes a base on which is superimposed a margin, usually in percentage form, to cover other costs and profit. Although the generality of such procedures, usually carried out by persons far down in

⁸¹ Harrod, *op. cit.*, p. 162.

the administrative hierarchy of the firm, has been amply demonstrated empirically, the relation of prices so computed to prices asked and adhered to is much less clear. Here we shall explore two types of cases: (1) cost formulas in certain flexible-product manufacturing industries and (2) the use of markups in the distributive trades.

COST FORMULAS FOR PRICING

THE manufacturing industries in which the variety and changing character of products require that frequent price decisions be made include the metal casting, stamping, and forging industries, mechanical rubber goods, specialty paper manufacturing, and doubtless many nonbasic chemical businesses. In some of these the product wanted by two customers is rarely the same. In others the variety of items wanted by users is wide and changing, or newness may be initiated by the manufacturer. In many of these goods, e.g. castings, price is agreed upon before the order is given. But these formulas are also used in connection with pricing the numerous "new" or varied products of metal-working or other plants turned out in advance of sale.⁸² On the production side, typically, the labor and to a large degree the plant also are adaptable to a variety of items and to frequent change of items. Usually the costs which are not directly assignable to the item being priced constitute a high proportion of total costs in the enterprise, but there are important exceptions to this condition.

In such businesses, pricing formulas applicable to the enterprise, or separate formulas for product areas, have evolved in which price is computed as a multiple of estimated direct cost, or as a multiple of direct labor cost to which direct material costs are added. Examples are provided by Dean⁸³ and appear frequently in accounting and business management journals. During World War II the Office of Price Administration approved the use of formulas of this sort which manufacturers had used in a "freeze" period as the device for determining ceiling prices where the goods to be sold were not analogous to those produced in the "freeze" period.⁸⁴

⁸² Obviously in both types of situations referred to here, one use of the cost formulas is to choose between whether to take an order or make an article for future sale. But cost-price comparisons of this sort are part even of the pure competition model.

⁸³ Dean, *Managerial Economics*, pp. 446-447.

⁸⁴ An example is found in the machinery price regulation, Maximum Price Regulation No. 136. Thousands of pricing formulas of this sort were filed with Office of Price Administration (OPA), and even more price computations were made by

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DISTRIBUTIVE TRADE MARKUPS

A SIMILAR procedure prevails in the distributive trade markups on invoice cost,⁸⁵ which differ among categories of goods or even among individual products.⁸⁶ Markups provided under manufacturers' list prices are quite uniform not only among manufacturers who occupy similar market positions in the sale of a given product line such as tires⁸⁷ but also for a category of goods such as appliances.⁸⁸ Where retail prices are set by individual stores, there is substantial variation in margins on particular items,⁸⁹ but these disparities are much less when type and location of store are defined narrowly.

DETERMINANTS OF FORMULAS AND MARKUPS

SUCH pricing formulas or gross margins need not be full cost in the sense that the individual firm or even the industry relates them to the cost of particular products or items. In the manufacturing industries referred to here, most costs other than for direct labor and materials are common for a family of products or for all of the products sold by the enterprise. In the distributive trades practically all costs other than for goods bought for resale are common for a department and many for the enterprise as a whole. For such manu-

their use. So far as the present writer knows, no analysis of the structure of these formulas has been published. Some comments on the experience with their use in price control are contained in *Historical Reports on War Administration: Office of Price Administration*, No. 8, "Problems in Price Control: Pricing Techniques," pp. 85-90 and No. 6, "Studies in Industrial Price Control," pp. 101-176, but in the judgment of this writer they fail to bring out the major reason why such pricing formulas proved to be loose price control. See p. 383 below.

⁸⁵ Actually most of these margins are expressed as a percentage of selling price rather than of invoice cost.

⁸⁶ There are notable exceptions for trades such as those handling perishables where price movements and possibilities of loss are frequent. In fresh fruit and vegetable wholesaling and fresh fish wholesaling, dealers tend to buy for what they have to pay and sell for what they can get, with the spread over a period of time being enough to cover costs.

⁸⁷ This is shown in exhibits filed by the Department of Justice in case 126-193 Criminal, Federal District Court for Southern District of New York. Companies other than the Big Four provided larger initial margins, but these were "traded away" so that in the end retail prices were lower on brands of small companies.

⁸⁸ This again was shown by the experience in price control, in which the present writer participated. However, the commodity areas where margins, as shown by price lists, are quite uniform are also those in which departures from lists are frequent and responsive to demand conditions.

⁸⁹ See *Survey of Retail Sellers of Apparel and House Furnishings*, Office of Temporary Controls, OPA Economic Data Series 9, where the range of margins for each category of goods is shown.

facturers the only available data are standard or actual costs for a group of products, or for the distributive trades the storewide expense rate.⁹⁰ Under these circumstances cost formulas or gross margins replace allocations of common costs in sellers' thinking about prices.

Such formulas and gross margins are affected by competitive influences but by what process and how promptly is not clear. In the distributive trades, margins on particular items and even for enterprises tend to reflect the services offered. Within a given trade or even in an individual store, margins vary widely on different products handled⁹¹ but, as was noted above, these differences can rarely be related to cost differences. Presumably, such margin differences reflect competitive experience. Certainly margins do change on occasion, particularly as new types of businesses take on the line.⁹² Such competitive forces also affect pricing formulas in manufacturing, a fact which has been generalized by Andrews in this discussion of forces shaping the "costing margin" which is added to direct cost to determine price.⁹³

TESTING THESE PROCEDURES UNDER CHANGED CONDITIONS

THE empirically demonstrated fact that cost formulas and gross margins enter widely into pricing operations is open to two types of misinterpretations. One is that these procedures replace managerial attempts to gain by adjusting prices for factors not reflected in formulas or margins—a statement preferred for present purposes to the term, "profit maximization." The other is that prices are actually set by such procedures and maintained. These two points are in a sense the same; the first deals with the consistency between an observed administrative procedure and the theory of price. The second is a question of fact as to whether prices do accord with the formulas.

The development and repetitive application of procedures by which prices are actually set, and which consequently govern the

⁹⁰ This means all expenses, except cost of goods bought for resale, expressed as a percentage of net sales.

⁹¹ Thus the OPA fixed margins on particular items of dry groceries sold in large stores which conformed roughly with the trade's experience. For a given type of store, margins varied from a low of 6 per cent of invoice cost to a high of 25 per cent, while the over-all gross margin of large chains was about 16 per cent of cost of goods. In other trades the variation is less.

⁹² The selling of drugstore and tobacco store items by chain food stores has had this effect on margins on these items formerly sold only in the first stores.

⁹³ Andrews, *op. cit.*, pp. 163-180.

sellers' volume, is not, per se, inconsistent with pecuniary motivation. A fresh recomputation of all factors in the situation need not be made each time another order is taken or a shipment of goods for resale received. The issues rather are (1) whether such procedures have been worked out (or evolved) so that, for the conditions for which they were designed, they are consistent with the theory of the firm; and (2) how, if at all, the procedures are revised when a change in those conditions would warrant their modification.

Where a pricing method is repeatedly applied, as is undoubtedly the fact in those manufacturing and distributive industries just considered, one can claim that the test of the market has endorsed the procedures. These industries are in the competitive zone as industries have been classified.⁹⁴ Presumably their pricing methods are the result of rivalry among firms who have different views as to the variables or who are doing business in different ways.⁹⁵

But it is still possible that, with firms uncertain as to their demand situation or as to costs for individual products, prices will be too high or too low on such individual products. The price of nails at a hardware store or of sugar at a grocery—two very low-margin items—may not reflect the maximizing of retailers' profits on those items. This is important with respect to the resource allocation and rationing functions of the prices of those commodities. But in examining whether the distributive trades are efficient or how they carry on their business as a whole (i.e. how they adapt to cost and demand conditions), the adjustability of their over-all gross margins is a more fruitful subject of inquiry.⁹⁶ Indeed, retailers view their business as selling a retail service, not by items handled but for an outlet as a whole.⁹⁷

Let us now consider the repetitive application of a pricing procedure which, by an adaptive process, came to represent a rational reaction to cost and market considerations. Such conduct is appropriate so long as those conditions obtain. Obviously, changing the rules or making exceptions from them involves persons in the upper echelon of a firm's command; indeed, that is their pricing job.⁹⁸ What evidence is there on this question?

⁹⁴ E.g. George J. Stigler, in *Five Lectures on Economic Problems* (Macmillan, 1950), pp. 55-57, and Clair Wilcox, "On the Alleged Ubiquity of Oligopoly," *American Economic Review*, Proceedings, May 1950, pp. 70-73.

⁹⁵ Andrews, *op. cit.*, pp. 163-180.

⁹⁶ Cf. Richard B. Heflebower, "An Economic Appraisal of Price Measures," *Journal of the American Statistical Association*, December 1951, pp. 467-478.

⁹⁷ This theme is developed by M. A. Adelman in an unpublished manuscript on the A. & P. Company.

⁹⁸ The rule-making rather than rule-applying role of top management is stressed

Undoubtedly, a thorough examination of pricing formulas which consist of cost computations would show the frequency of their violation in the direction of lower prices. The same companies who filed with OPA pricing formulas which provided large margins over direct costs proved to be content with prices on large-volume items which by the same accounting procedures, would cover only manufacturing cost with no margin for general overhead or profit.⁹⁹ To say that such was the pricing on a large order and that reduction in expected overhead would leave a profit margin merely shows that pricing does not follow the formula. Another piece of evidence which points to the same conclusion is the way in which these companies sought to get higher ceiling prices relative to costs by modifying what they made. When they changed the product significantly, they were allowed to use their pricing formula to compute the price ceiling. Quite generally, prices so computed were more profitable than prices for the particular castings, stampings, or types of machinery they had sold at the date to which "freeze" prices applied.

Actually, I would hazard, such formulas are used only when there is no competitive reason for doing otherwise. Consequently, I would hazard also, the profit and loss statements of companies who flaunt such formulas would show, even in good times, that on their over-all business they obtained a far smaller markup over direct costs than is provided in the formulas. In times of low demand such after-the-fact proof would show, I think, still smaller markups on direct cost. So far as I know, there has been no systematic study of this sort.

An interpretation of distributive margins, on which there are more data, cannot be made without simultaneously considering operating cost and dollar-volume movements. Fixed percentage margins become widely varying dollar margins when the level of invoice costs changes substantially. Thus the approximately 16 per cent (of invoice cost) store-wide gross margin of large food chains in 1939, as found by OPA, yielded about 18 per cent more dollars to cover operating expenses and profits in 1941 because the wholesale cost of food had advanced that much.¹⁰⁰ Dollar costs advanced also, but by a smaller percentage, so profits rose. When dollar sales fall, the

by A. G. Papandreou in "Some Problems in the Theory of the Firm," in B. F. Haley (ed.), *Survey of Contemporary Economics* (Irwin, 1952), Vol. II, pp. 185-191.

⁹⁹ Examples the writer noted included automotive crankshafts and fractional horsepower motors for original equipment sales.

¹⁰⁰ Actually, as is pointed out in note 101, the percentage gross margins of these stores declined from 1939 to 1941.

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reverse happens. Typically, the concomitance of the movement of the level of invoice prices to which percentage margins apply and of factor prices entering into operating expenses becomes an important qualification of the idea that margins have a rigidity unrelated to operating cost and demand developments.

Space cannot be taken here for a full analysis of this sort, but some suggestive figures can be given. In Table 1, it is noted that in men's clothing stores the gross margin fell 1.4 percentage points

TABLE 1
Gross Margins as a Percentage of Net Sales of Selected Types
of Retail Stores, 1936-1941 and 1947-1951

Year	Men's and Boys' Clothing Stores ^a	Department Stores ^b	Large Furniture Stores ^c
1936	37.0	36.5	
1937	36.2	36.4	32.4
1938	35.6	36.4	28.5
1939	36.7	36.9	28.6
1940	n.a.	37.0	29.0
1941	37.3	38.2	31.8
1947		35.4	39.7 ^d
1948		35.6	38.9 ^d
1949		35.2	38.5 ^d
1950		36.5	39.8 ^d
1951		35.3	38.9 ^d

n.a. = not available.

^a OPA Economic Data Series 22, Office of Temporary Controls, Table 9. Figures are for 56 identical stores.

^b Annual surveys of *Operating Results of Department and Specialty Stores* (Harvard Business School).

^c Annual survey of *Retail Furniture Store Operating Experiences and Departmental Activities* (National Retail Furniture Association).

^d Not comparable with prewar figures because some expenses then considered to be part of cost of goods have, more recently, been included in operating expenses.

from 1936 to the depression year 1938 and then rose 1.7 percentage points by 1941. Similar changes in gross margins for furniture stores occurred. Those for department stores did not reflect the recession of 1938 but did expand by about 1.5 percentage points by the prosperous year of 1941. A contributing factor was that markdowns from original asking prices, which varied by size of store from 6.9 to 11.4 per cent of sales in 1938, fell to only 5.3 to 6.4 per cent in 1941. A similar sort of development in automobile retailing was that the *gross loss* on used automobiles traded in by a group of dealers fell from 8.2 in 1939 to 6.4 per cent of sales in 1941.¹⁰¹ But the gross

¹⁰¹ OPA Economic Data Series 19, Office of Temporary Controls, 1947, Table 9. This means that less of the rigid new car margin was traded away in the

margin of four major food chains, who are in a highly competitive business, was about one percentage point less in prosperous 1941 than in 1939.¹⁰² On the other hand, the stability of postwar margins (as shown in the table), even when goods were short at going prices, does attest to the failure of margins to expand just because demand is high.

These data all suggest that margins prove to be less rigid than they appear to be; but further analysis would have to consider cost movements, the timing of entry, elasticity of capacity, and a series of other points. All that can be concluded here is to suggest that margin pricing in the distributive trades is less uniform among sellers, and less rigid over time, than has been asserted.

5. *Factor-Price and Selling Price Changes*

A MORE generalized form of the cost approach to price changes than those involving precise formulas and gross margins is that which sees selling-price movements geared to cost changes, particularly those which reflect movements of labor rates and material prices. Such theories apply to industries in which price decisions and price changes are infrequent as well as to those in which they are numerous. The doctrines apply both to industries in which direct costs are a moderate proportion of prices and to those in which the margin over direct costs is narrow. They are applicable both to highly concentrated industries with strong price leadership and to those with substantially less of both attributes.

That selling prices are responsive to substantial movements in direct costs is orthodox theory, but the doctrine being considered here differs in two regards: (1) In value theory the price changes by less than the change in marginal cost by an amount determined by the slopes of the marginal cost and marginal revenue curves. Here, however, the price change corresponds—some say in absolute amount and some say in a percentage—to the change in direct costs. The effect on volume is considered inconsequential or is disregarded. (2) Selling prices are presumed not to respond to demand move-

prosperous year 1941. Margin on used cars is expressed here as gross loss because what was received for the used cars when resold was less than what had been allowed on them as trade-ins.

Although it cannot be documented in a comparable fashion, one can conclude safely that a comparable oscillation of realized margins occurs between good and bad times for most "big-ticket" consumer goods. Hence the apparent rigidity of the "margins" provided by manufacturers' retail list price and discount arrangements is illusory.

¹⁰² OPA Economic Data Series 26, Office of Temporary Controls, 1947.

ments when the latter do not correspond in direction and degree to factor-price change.

USER COST AND GROSS-MARGIN STABILITY

FROM a theoretical critique aimed at the limited assumptions and static nature of the doctrines of E. H. Chamberlin and Joan Robinson, Neal arrives at the conclusion that under "realistic" conditions selling prices can be expected to reflect movements of prime cost when that term has been enlarged to include "user cost."¹⁰³ By the latter is meant "the change in the value of the facilities of the firm due to operating, as opposed to not operating, during the week. 'Facilities' is a very broad term which covers plant, goods in process, inventory, access to markets, customer relationships, good will, and similar items."¹⁰⁴ Neal says further: "User cost, which may be *positive* or *negative*, expresses the net result of selected factors which are not included within the Chamberlin-Robinson type of analysis."¹⁰⁵ When demand falls, user cost rises and vice versa. Since, in the thinking of management, user cost is added to marginal costs,¹⁰⁶ a demand decline, for example, tends to raise marginal costs with given factor prices; and a resistance to price reduction is built. Consequently, Neal concludes that margins over direct costs tend to be rigid, and such product price changes as do occur will be a reflection of direct cost changes and not of the structure of the market.

Neal then offers extensive statistical proof of his thesis from the 1929-1933 experience. He found a high correlation between price changes "expected" (on the basis of the movement of direct costs) and price changes which occurred from 1929 to 1931 and from 1929 to 1933.¹⁰⁷ At the same time there was only a low correlation between price changes and the degree of concentration in the respective industries.

The statistical part of Neal's study has all of the weaknesses and merits of the census data used in developing the measures of expected and of actual price change. The latter are census indexes of prices in which the price for each period is found by dividing reported value of products by units of output. Thus a "census index" is a variable rather than a fixed weight index. The value of product data presumably reflect price concessions¹⁰⁸ and also the numerous

¹⁰³ Neal, *op. cit.*, Chap. III.

¹⁰⁴ *Ibid.*, pp. 58-59.

¹⁰⁵ *Ibid.*, p. 71.

¹⁰⁶ *Ibid.*, pp. 65-66.

¹⁰⁷ *Ibid.*, p. 124. The Pearsonian coefficient of correlation between the two series was plus .85 for the 1929-1931 period and plus .92 for the 1929-1933 price changes.

¹⁰⁸ A major possible source of error is that they are on a plant basis and the

product composition shifts which firms make when demand changes. Because different items in a product line provide different margins over cost, these product-mix shifts can change the sellers' realizations relative to costs and change what buyers on the average pay for goods, even though the price of individual items remains unchanged. Neal thinks that this characteristic of a census index is a defect of his study, but for some purposes the present writer holds that this is a merit.¹⁰⁹ It should also be noted that product-mix shifts, which often reflect buyers' choices, affect such a measure and hence the index shows not merely responses to movements of direct cost but also reflects the influence of demand changes.

Presumably firms following Neal's thesis would make overt price changes for identical goods in proportion to direct-cost changes. But a comparison of movements of Neal's census indexes with changes of comparable wholesale price series would show, I am certain, that the latter dropped less from 1929 to 1933. So what Neal's measure demonstrates is that the adjustments of quoted prices, plus price concessions and modification of product quality and of composition of product groups, brought about changes in average realization per unit for product groups which were about the same in percentage as changes in direct costs.

DIRECT COSTS PLUS "COSTING MARGIN"

ON THE basis of studies of business behavior, nearly all of which are unpublished, Andrews concludes that businessmen change prices when, and in the short period ordinarily only when, direct costs change; that is, he holds that prices consist of varying direct costs plus a "costing margin" which reflects experience with what can be obtained above direct costs.¹¹⁰ The argument depends on the view that manufacturers usually sell to other businesses and that customary relations between a manufacturer and these other businesses are not only greatly valued but also give a market share which cannot be altered materially in the short run, at least by means which do not have longer-run adverse consequences for the initiator. But a change in price which accords with changes in direct costs, since these cost movements tend to be uniform in impact, does not change shares;

reporting companies' statements of value of products in intracompany transfers must be accepted.

¹⁰⁹ Heflebower, *op. cit.*

¹¹⁰ To get the whole of Andrews' argument, *op. cit.*, Chap. v should be examined.

and a proportionate price change would not be interpreted as a competitive maneuver.

DEMAND ASSUMPTION IN THESE PROPOSALS

WHILE both Neal's and Andrews' proposals appear in the first instance to be cost approaches to prices, they actually depend heavily on the expected reactions of rivals. In this their analysis is somewhat analogous to the "kinked" demand curve idea but not entirely so. Neal includes more than the expectation of rivals' prompt response to a price cut in his user cost concept. To some degree he, Andrews even more so, and Harrod explicitly so,¹¹¹ look upon short-period market conduct as being governed by longer-period demand considerations. Among these are each firm's high regard for the affiliation of customers and the conviction that market share cannot be built quickly or solidly by overt price maneuvers.¹¹²

Some comments on Stigler's statistical testing of the "kinked" demand curve follow logically from this discussion of the doctrines of Neal and Andrews. Stigler finds that in seven industries examined "there is little historical basis for a firm to believe that price increases will not be matched by rivals and that price decreases will be matched."¹¹³ He assumes that the kinked demand curve can be observed from the actual conduct of the firms; while its promulgators, particularly Sweezy,¹¹⁴ interpreted it as an imagined curve, whose contour varies according to a number of influences such as the percentage of the industry's capacity utilized. Presumably a price increase would not take place if the kink were sharp and unfavorable. That price increases by one firm are generally followed by others might mean nothing other than that they occur only when the kink is eliminated by collusion, by orders above capacity, or by substantial increases in factor prices, influences not considered in this test by Stigler. Furthermore, in his later test of frequency of price change, no consideration is given the experience of such industries as petroleum refining, starch manufacture, and the tire industry with changes in factor cost.¹¹⁵ These comments cannot be

¹¹¹ Harrod, *op. cit.*, p. 162.

¹¹² This interpretation of Andrews' theory is brought out by M. J. Farrell in a note in the *Economic Journal*, June 1951, pp. 423-426. For a view similar to Andrews', see R. A. Lester, "Equilibrium of the Firm," *American Economic Review*, March 1949, pp. 478-484.

¹¹³ George J. Stigler, "The Kinky Oligopoly Demand Curve and Rigid Prices," *Journal of Political Economy*, October 1947, reprinted in G. J. Stigler and K. E. Boulding (eds.), *Readings in Price Theory* (Irwin, 1952), p. 425.

¹¹⁴ Sweezy, *op. cit.*, *Political Economy*, XLVII (1939), pp. 568-573.

¹¹⁵ Stigler, *op. cit.*, p. 429.

carried further, for the only purpose here is to suggest that substantial movements of direct costs may remove the "kinks," as do effective price leadership or collusion.

To return to the demand assumptions made but not developed by Neal and Harrod (i.e. their explanation of why price changes do not follow short-period demand movements), they can be turned into an explanation of why stability can exist when marginal costs¹¹⁶ are below price as they must be at times when prices do not follow demand changes. Neither Chamberlin¹¹⁷ nor Mrs. Robinson¹¹⁸ find the explanation in inelasticity of the firm's demand curve. They attribute failure to change prices with demand movements to adherence to a code which amounts to agreement. Andrews, on the other hand, stresses the impact of longer-term considerations of the firms individually on their short-term conduct. Furthermore, Mrs. Robinson does not note that such views as those of Andrews, to which she makes reference, are also an explanation of why competition can exist when most of the time sellers have some excess capacity. This problem becomes particularly acute when marginal cost curves are flat over a wide range. But failure to exploit idle capacity in the short run, according to Neal, Andrews, and Harrod, results not merely because of rivals' expected reactions to price cuts but also because reducing the margin over direct costs is inconsistent with longer-term objectives of the firm.

REACTION TO DEMAND CHANGES

AN IMPORTANT corollary of the doctrines being examined here is that prices are not revised when demand rises or falls. The exceptions occur when there is a concurrent movement of direct costs or when the demand change is sizable and prolonged. Otherwise, non-responsiveness of quoted prices is supported by general observation and by the literature of the rigid-price controversy of the 1930's. That it is less true of transaction prices has been amply documented for a few industries;¹¹⁹ but the extent of price concessions, the re-classifications of customers, and the adjustments in freight charges and services rendered which go on with demand variations are little

¹¹⁶ Marginal costs as used here excludes Neal's user costs.

¹¹⁷ Chamberlin, *op. cit.*, pp. 318-325.

¹¹⁸ Joan Robinson in *Monopoly and Competition and Their Regulation*, edited by E. H. Chamberlin (Macmillan, 1954), pp. 245-251.

¹¹⁹ A notable example is the Bureau of Labor Statistics study made for the OPA and reported in "Labor Department Examines Consumers' Prices of Steel Products," *Iron Age*, April 25, 1946.

appreciated. The present writer has found few exceptions to the rule that transaction prices vary to some degree relative to quoted prices when the latter do not move in response to demand.

Beyond that, variations in product specifications and in volume of sales (in channels of sale or of items in the line which provide wide as opposed to narrow margins) occur in the direction of movements of demand. Consequently, realizations from the composite of items and channels of sales vary relative to direct costs even though transaction prices, as well as quoted prices, remain unchanged. Of course, transaction prices also tend to vary relative to quoted prices. Altogether demand has a greater impact on the gross margin over direct costs than is shown by quoted prices, or even transaction prices.¹²⁰

After all of these qualifications—and they are important—there remains the fact that when demand varies there is a marked “stickiness” of quoted prices and probably also, but to a lesser degree, of transaction prices. Realizations move sluggishly by price concessions and by the indirect means stressed in the preceding paragraph. But according to the doctrine examined here this “stickiness” is less or nonexistent when substantial changes in direct costs occur.

This general pattern of reaction to factor price movements by overt selling price changes, but to demand changes by means which work more slowly and indirectly to affect the level of realization, is promising, but interpretation of this kind of price performance requires much further work. Among the difficulties of interpretation is the fact that prices of raw materials are themselves often a reflection of demand. The close association between the prices of vegetable oil and of shortening, for example, may mean that the former reflect the demand for the later. Furthermore, the frequency of sizable changes in the price of raw materials may be important, or the structural aspect of the market (or the character of the product which facilitates “agreement” or makes nonovert price adjustments easy or difficult) may be relevant in spite of Neal’s findings from the use of crude data. Finally, cases in which movements of factor prices and of demand are not concurrent will be particularly useful in sorting out the cost influences on prices and realizations from those of demand.

6. Concluding Comments

THE full-cost doctrine and the other theories which relate price

¹²⁰ This argument is developed further in Heflebower, *op. cit.*

change to direct-cost movements are attempts to deal constructively with price theory as applied to markets which fall between the competitive and the monopolistic. These ideas clearly reflect the impasse reached in the attempts to develop oligopoly theory within the neoclassical framework.¹²¹ But these doctrines also reflect dissatisfaction with the assumptions underlying the theories of monopolistic and imperfect competition, both as to the number of assumptions needed and as to the accuracy of those used. The corrections Neal proposes are presented as providing a more accurate empirical content for marginal cost and marginal revenue curves than that often assumed.¹²² Indeed, Harrod's model not only provides views as to the shapes of cost and revenue curves different from those usually stated, but is a model of part of a larger revision of the theory of imperfect competition. Andrews goes further, for he prefers to drop the marginal framework in deriving generalizations about industrial markets.¹²³ Part of his reason for this, and the dissatisfaction of others with neoclassical theory, arise from what they consider to be the preeminently static character of that theory. Particularly serious is the way uncertainty is handled¹²⁴ or disregarded. Adapting marginal theory to encompass more variables and to make it dynamic tends to make it meaningless.¹²⁵ But the postwar marginalist controversy need not be revived here.

On the positive side, neither the full-cost doctrine in its more precise form nor the similar ideas reviewed here, yet constitute a fully developed or demonstrated body of price theory. The empirical work from which the theories stem has been spotty in quality and in its representation of situations. The theoretical deductions from empirical observations leave many questions unanswered. Even traditional concepts, such as "capacity" and "cost," have been difficult to use empirically or have been given new usage without adequate explanation. For this reason, and because the usual theoretical

¹²¹ This is stated explicitly by Hall and Hitch (*op. cit.*, pp. 109-112) and is an element in Fellner's solution via "limited joint profit maximization" (*op. cit.*, pp. 146-157). Chamberlin (*op. cit.*) adopts the full-cost doctrine as one way out of the stalemate.

¹²² Neal (*op. cit.*, Chaps. III and IV).

¹²³ See his essay in *Oxford Studies in the Price Mechanism*, as cited, pp. 171-172.

¹²⁴ See R. A. Gordon, "Short-Period Price Determination," *American Economic Review*, June 1948, pp. 280-281.

¹²⁵ "Refuge in subjective interpretations of the cost and revenue functions is certainly no answer. It leaves theory saying that businessmen do what they do because they do it." *Ibid.*, p. 287.

framework has not always been used in exposition, the theoretical interpretation has often been confusing, particularly to readers steeped in neoclassical doctrine. Part of the problem of clarity also stems from the simultaneous exposition of an underlying tendency and of its qualifications. This seems an unavoidable burden when the conclusions are based on empirical work in contrast to deductive theorizing where complexity is controlled by the assumptions made.

Despite these limitations, two valuable but not fully demonstrated hypotheses run through the literature on this theory. One has to do with market policy in a situation of present uncertainty both about rivals' reactions to price moves and about future developments impinging on the group. Under such circumstances, firms may place more faith in cost guides than in considerations ordinarily viewed as reflecting demand. The implications of such an hypothesis for both the level and the conditions of change of prices need not be developed here. The second hypothesis concerns the adoption of a short-term policy which reflects both longer-term cost and demand considerations. This requires reconsideration of what is maximized in the short run and of the short-term corrective role of prices in industrial markets. Both hypotheses suggest important aspects of the task which still remains, that of the development of satisfactory, empirically verifiable models.

C O M M E N T

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HEFLEBOWER's paper is largely devoted to what has become known as the full-cost principle, which holds that producers set prices "with regard only to total unit costs at some assumed volume rate." It implies both that cost alone matters in pricing, and that what is taken into account on the cost side is not the change in total cost associated with a change in output, but some sort of average or computed cost. I have also been asked to discuss Machlup's paper, which is on the theory of price discrimination. In this theory it is taken for granted that producers in fixing prices take into account demand conditions in the various markets in which they sell their products, and the argument runs, broadly speaking, in marginal terms. It is clearly a theory which, if the full-cost principle applied generally, could have no relevance because the practices which it describes could not exist. The organizers of this conference have so contrived things that if I am to take Machlup's paper seriously, it is first neces-

sary that I should reject the full-cost principle. Fortunately, I found Heflebower's discussion of full-cost pricing extremely congenial and the reader need not expect that I will argue that the pricing practices so vividly described by Machlup exist only in his own imagination.

I have implied that Heflebower rejected the full-cost principle. Perhaps this is too strong. But I had the impression, at the end of reading his paper, that if the full-cost principle was still standing, it was only because it was supported by two old gentlemen, one of whom was certainly Demand and the other of whom looked uncommonly like Marginal Analysis. It is clear from Heflebower's masterly survey that many of the arguments used by supporters of the full-cost principle are in no way inconsistent with orthodox economic theory. Much of what has been called full-cost pricing, as Heflebower indicates, would be better termed "gross-margin pricing," and in so far as the determination of the gross margin is discussed, there seems to be little doubt that it is influenced by demand considerations. It would be idle to pretend that present-day economic analysis is not in need of improvement, but it does not seem sensible to expect that such an improvement will be achieved by denying the importance of demand conditions in the determination of price.

I think the full-cost principle has seemed attractive to many economists because of their discovery of the work of the cost accountant and of the part it plays in business decisions. At first sight the practices of the cost accountant do seem to be inconsistent with the assumptions of normal economic theory. But this feeling ought not to persist if one realizes that in a large or complicated organization there is a need for some cost accounting system. In any large organization in which individuals using resources do not know the alternative use to which these resources could be put (so that they cannot choose whether they should be used in this way or that but only whether they should be used in this way or not), it will usually be necessary, if the organization is to run smoothly, to attach cost figures to the use of particular resources. You get the whole paraphernalia of machine-hour rates and similar figures. Heflebower gives a long list of industries in which cost formulas are used.

Economists are very liable to be impressed by the fact that the cost accounting figures will often not reflect the receipts which would accrue through the use of a factor in another way and that their use for pricing or for other business decisions will give results different from those which we would expect from our ordinary economic analysis. But it should not be assumed that there do not

exist within a business organization means for correcting the position when the action to which the cost accounting figures would lead is obviously absurd. R. S. Edwards of the London School of Economics has emphasized that one ought also to examine what happens *after* the cost accountant has prepared his figures. And in a recent article, he gives some interesting examples illustrating his point of view.¹ Heflebower argues in much the same way. He tells us that "a thorough examination of pricing formulas which consist of cost computations would show the frequency of their violation in the direction of lower prices." And in connection with a closely related point, he observes: "The present writer has found few exceptions to the rule that transaction prices vary to some degree relative to quoted prices when the latter do not move in response to demand."

I am quite willing to accept as a purely descriptive statement about business behavior that a businessman fixes prices by adding to direct cost a "reasonable" margin for profit (or to cover what is termed overhead). But as it now seems to be agreed, and this is in accordance with Heflebower's observations, that this margin varies from firm to firm, from product to product, and from time to time, I cannot help feeling that what is considered a "reasonable" margin is closely related to what the businessman thinks he can get. I make this statement subject to the understanding that the businessman cannot usually make a separate decision for each product (so that a rule of thumb is needed), that these rules of thumb, if they are to be useful, must be observed for some time, and that the businessman often has no exact knowledge of his demand and cost conditions. I am not willing on the basis of the arguments brought forward so far to abandon ordinary marginal analysis (taking account of demand) as a first approximation. It is clearly not the whole story and there is need for much more research on business behavior. But we should not be disappointed if a good deal of economic theory turns out to be usable after our investigations are completed.

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THE major issue of the full-cost principle controversy seems to be: What is the nature of the challenge to the "tenets of generally accepted economic theory" presented by the "discovery" that business

¹ R. S. Edwards, "The Pricing of Manufactured Products," *Economica*, August 1952.

firms do, in fact, in many cases employ rules of thumb in pricing their products?

In its strongest and most extreme form the challenge might be interpreted to mean that the economic theorist's rational-action models are not useful analytical devices for prediction of behavior; that business firms behave in a nonrational fashion; and that they are dominated by custom and by arbitrary socially established standards. Those who take this extreme position must face the burden of establishing the proposition that the nonrational models lead to predictions of firm behavior at least as good as those derived from rational-action models. Closely associated with this burden, however, is another and somewhat more difficult task. If the standards and rules of thumb (markups, margins, etc.) employed by firms in the pricing process are not invariant, if they are subject to change on short notice, it becomes necessary for the advocates of the nonrational approach to offer a theory—no matter how simple—that accounts for the standards and rules of thumb employed by firms at any one time. They must be in a position, in other words, to predict *which* rule of thumb will be employed by *what* firms at *what* time and place. The attempt to do so, I am convinced, will make it necessary for them to fall back upon a rational-action model of one sort or another—and the differences between their practice and that of the theorist will become imperceptible. My conviction is not founded on the notion that only rational-action models are capable of yielding useful predictions in the social sciences; rather it stems from the notion that in the rationalistic-scientific culture of twentieth-century industrial society nonrational models of behavior are not apt to lead to useful results. This may be much less true of consumer behavior than it is of business behavior, as is indicated by the relative success of formulations of nonrational models of consumer behavior (i.e. the Keynesian consumption function). Be that as it may, I should be willing to give up my rational-action tool kit if the advocates of nonrational behavior models could either establish a high degree of invariance for the standards and rules of thumb they claim business firms employ, or offer a theory that accounts for changes in these standards and rules of thumb. Until they do either one of these things, the economic theorist may disregard their attack upon his methods of theory construction.

It is well known, of course, that the full-cost principle in all of its many forms can be incorporated easily into a rational-action

model. Linearity of the cost function, the cost of changing price, and uncertain expectations may easily explain why management uses rules of thumb as a "procedural step"—to use Heflebower's terminology—in the process of independent profit maximization. In oligopolistic markets, collusive and quasi-collusive resolutions of the "game" may also account effectively for the employment of rules of thumb within the rational-action frame of reference. All this is too well known to require further discussion on my part.

Does this mean, however, that, since the theorist can "fit" certain observed patterns of behavior into his analytical frame of reference, economists may consider the challenge nonexistent and proceed to rest on their laurels? It seems amply clear to me that this is not the case. The task of the theorist, as I see it, is not to "explicate" reality; rather, it is to construct analytical models that permit him to predict reality. This implies the need for operational concepts and operationally meaningful propositions—propositions, that is, which refer to empirical data. It is not sufficient for us to "account" for observed patterns of business behavior. We must be in a position to make a prediction about business behavior. Our success in this regard has been only moderate. Too many of us are satisfied too much of the time with an "accounting" for or an "explication" of observed behavior. Altogether too little effort is being expended toward the development of operationally meaningful theories. In this, I believe, lies the challenge presented to us by the advocates of the full-cost principle. Even though their criticisms are misdirected, and even though their constructive work has not borne much fruit, they have served to focus our attention on the vital need for constructing useful theory—theory, that is, which is capable of yielding predictions about empirical reality.