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Chapter XI

THE IMPLICATIONS OF COST BEHAVIOR FOR PRICE ANALYSIS

THE foregoing chapters have been concerned in the main with the analysis of some aspects of cost behavior in the individual firm. An empirical consideration of cost-price relationships would have to take account not merely of other aspects of cost behavior but, more particularly, of the demand situations encountered by the firm. This the Committee on Price Determination is not at present prepared to do. It is hoped that the preliminary analysis of cost behavior offered here may be followed by further investigations of demand considerations. In the meantime it may be useful to offer a few observations on the implications of the preceding discussion for price analysis.

1. The Utility of Cost-Price Theory

Reflection on contemporary price theory in the light of the complexity of actual price situations leads to two conclusions: (a) the conceptual models in current use represent an extreme, and probably undue, simplification of the situations a firm has to meet, and (b) price analysis nevertheless provides a number of useful if not indispensable tools for empirical treatment of (at least) the cost side of cost and demand relationships.

Price theory usually envisages a firm producing a single product and confronted by one of the series of possible situations which emerge from a classification of markets based on a number of sellers and the presence or absence of

product differentiation.¹ This firm adjusts its price to short or long run anticipations and under certain circumstances may undertake to discriminate among buyers. The conceptual schemes which represent the various possible combinations of these elements usually constitute what is commonly known as the economics of the individual firm. This set of conceptual schemes has certain rather serious limitations.

The industrial firm typically turns out a number of products to which a substantial percentage of the costs incurred are common. While the derivation of the cost function for single products presents no conceptual difficulty on the assumption that the quantitative relation of the commodities produced can be sufficiently varied, in fact the possibilities of variation are usually strictly limited. Common costs must necessarily be allocated among products on a basis which is, from an economic point of view, arbitrary. In some firms, e.g., oil refineries, the allocation is essentially on the basis of estimated relative elasticities of demand for the final product. Products with inelastic demands bear a high cost burden. Here it is the price that "determines" the cost, rather than vice versa. In most cases, however, costs are allocated on the basis of some technological factor such as machine hours, floor space or direct labor time. Whether an accounting allocation or a business judgment of cost is used in pricing decisions, it is not ordinarily the ascertainable incremental cost of a separate product which sets a limit below which the firm will not sell, but rather this plus some share of the common costs. In general, the statistical determination of the relation of output to cost is possible for a single product only in a single product plant. In other cases an investigation of the relation of costs to variations in an index of output may be useful, but not

¹ Such classifications have been presented by Fritz Machlup, "Monopoly and Competition: A Classification," *American Economic Review* (September 1937), pp. 445-51, and by R. L. Hall and C. J. Hitch, "Price Theory and Business Behavior," *Oxford Economic Papers*, No. 2 (May 1939), p. 15. Both of these classifications are based upon E. H. Chamberlin's *Theory of Monopolistic Competition* (Harvard University Press, 1933).

for the purpose of pricing the constituent products. Consequently a cost analysis which can serve for price determination must, in the typical case, take account of the various "noneconomic" conventional accounting procedures, rules of thumb, and habits of thought which relate to the allocation of common costs.

The conceptual schemes of price theory are weakest in their representation of the demand situations confronting the firm. The theoretical market classifications, which have as their principal purpose the demarcation of broad groups of demand situations, are useful but incomplete. Furthermore, the market structures which are relevant to industrial experience fall, in the main, into two classes: few sellers with, and few sellers without, product differentiation. (A small number of sellers implies that the sellers are mindful of the reaction of their rivals.) Competitive, monopoly and, probably, monopolistically-competitive markets lie outside the range of industrial experience. Typically there are a few close competitors of which an industrial firm always has to take account. Within the range of demand situations bearing upon this experience the attention of theorists has been concentrated principally upon two problems: (a) the types of reactions on the part of competitors which the firm must take into account in directing its own actions, and (b) whether and under what circumstances the demand function can be considered to be independent of the cost function, i.e., the problem of the relation of selling costs to demand. While the formulations of economic theory concerning both these problems—but particularly the former—are useful in empirical research, it seems probable that anticipated shifts in the demand curve, to which the firm must adjust its decisions, have more relevance for price policy than does its shape. Nor is research into the character of business anticipations regarding the variation of future demand situations by any means fruitless. Insofar as business anticipations are based largely on past experience, and this is undoubtedly the case, the kind of demand situation which will be expected by a firm in a durable

goods industry or in an industry undergoing secular expansion will be quite different from that expected by a firm producing nondurable goods or situated in a stable or declining industry. There seems to be no reason why a classification of demand situations that takes into account these and other considerations might not usefully supplement the unduly simple classification based on number of sellers and the presence or absence of product differences.

The distinction, traditional in price analysis, between short and long run adjustments is indispensable to empirical research. We are dealing here with a "planning period" definable as the length of time within which the anticipated results on the firm's revenues and costs that motivate a particular decision are exhausted. The distinction between short and long run does, of course, drastically simplify the problem. But, in the area of price decisions at least, it is generally valid to draw a rather sharp distinction between decisions made for a season or some other short period and those designed to hold for a much longer time. The length of the season will, of course, vary from industry to industry. In boots and shoes price decisions are ordinarily made by a large number of firms twice a year to apply to spring and fall sales. In the automobile and agricultural implement industries the "season" is a year. Long run price decisions are involved when a basically new product is introduced, a change is made in the channels of distribution, or a new price line is chosen for a range of products. Generally speaking, the shorter the time period the more stringent are the limitations on alternative lines of action. The role of cost considerations in pricing, furthermore, is apt to be very different for short than for long run decisions. Frequently the long run decision determines the price or the price range within which the product is to be sold; and the cost calculations, which are subsequent to the price decision, have to do with the kind of product that can be made to sell in the given price range. The practices in the dress industry illustrate this point. In any case the theoretical distinction between short and long run con-

forms closely enough to business practice to be useful in empirical research.

Finally, the conception of price current in theory is ordinarily so simplified as to eliminate a number of the issues the firm must face in determining what may be called its price policy. The price of the theoretical demand curve analysis is a "net realization" to the firm after deduction of freight charges and discounts. The focus of the price making forces, however, may be the delivered price in a number of consuming markets. Moreover, the "price" of a product, as discussed in Chapter III, may be a complex structure of related terms of sale, any variation of which will constitute a price decision and will cause a change in "net realization." In analyzing the price decisions of many large firms it is convenient to distinguish, with respect to all the firm's products, the price level from the structure of prices, and, with respect to an individual product, the price level of this product from its price structure. In a number of firms, e.g., in the iron and steel industry, a decision to increase the price of a few basic products may, through a system of fixed "extras" or price differentials, carry upward the price of thousands of related products. This would be a change in the level of prices. On the other hand, an alteration of differentials would be a change in the price structure. Similarly with respect to individual products the price decision may be directed to the price level or to the price structure embracing terms of sale.

Although the conceptual schemes of price theory have serious limitations for empirical research, they encompass a number of tools which are extremely useful for dealing with what is here the principal concern—cost behavior in the firm. The purpose of economic theory is not to supply factual answers but to pose the proper questions to the facts. With respect to a single-product firm the specific questions asked are: how do costs vary with the rate of plant utilization, with the size of plant, with technical changes and with changes in factor prices? The test of the "rightness" of a question is the relevance of the answer to

the phenomena to be explained, in this case prices or price changes. These questions *are* relevant, though for the price situations faced by the typical industrial firm they are not the only relevant ones. A "tool of economic analysis" is a correct statement of a relationship that bears upon the solution of a significant economic problem. Cost functions are "tools" in this sense. For useful empirical research, however, relationships must be more than relevant; they must also be amenable to quantitative, or at least factual, investigation. The extent to which cost functions, and other conceptual relationships which form the stock in trade of theoretical price analysis, can be subjected to empirical treatment has been discussed in previous chapters. With all the limitations there recognized, these conceptual devices still remain valuable tools for factual price analysis.

In bridging the gap between cost and demand functions and price determination, price theory conceives a shadowy figure called an entrepreneur who is busily and continuously engaged in "maximizing profits." The significance of this conception of the entrepreneur and of profit maximization for empirical price research deserves attention.

2. *Administrative Price Making*

It was pointed out in Chapter III that in large firms important decisions with respect to price are usually formulated by groups that frequently represent a compromise of varying points of view and conflicting interests within the firm. Furthermore, the price decisions which make up the pricing activity of the firm are apt to be distributed between various levels of the official hierarchy within a progressively narrower area of discretionary action as one descends the scale. A firm's salesman may have the power within limits to quote below the list price; these limits may be extended by his superior, while a change in the list price itself may require action by an executive group.

The conceptual schemes of price theory, moreover, tend to present price determinations as decisions made in the

light of a total situation. With every change in the shape or position of cost or demand curves there is supposedly a change in the price. For a firm selling a variety of products in many markets pricing activities require an administrative organization whose characteristics will of themselves affect the nature of the firm's price response to changing market situations. A decision to change the price of a leading article may not only persist over a season or some other considerable period of time, but may also affect the prices of many other articles related to it through a system of price differentials, with only such adjustments as come within the competence of administrative subordinates.

We are not here concerned with such profound questions as the nature or function of the entrepreneur, or of entrepreneurial activity. It may well be, as F. H. Knight and his followers insist, that "if the function is hireable it is not entrepreneurial in character."² The "entrepreneur" in the modern corporation may indeed consist simply of "those persons whose functional income is contingent and residual in the sense that no claim for income arises until all other functional claims are discharged,"³ i.e., ordinarily the common stockholders. All we are concerned with is a recognition of the fact that price making in the typical industrial concern, whether or not it is an entrepreneurial function, represents a series of administrative decisions which are likely to be influenced by the way administrative functions are organized in the firm in question.

The term "administered price" is illuminating if it is not interpreted to mean a particular kind of price behavior and if it is not contrasted too sharply with market price.⁴ "Price administration" is here used to denote the application, by officials of a concern, of a set of rules or policies relating to the pricing of the firm's products. The policies in question will be influenced to a greater or less degree by the

² Ben W. Lewis, "The Corporate Entrepreneur," *Quarterly Journal of Economics* (May 1937), p. 539.

³ *Ibid.*, p. 537.

⁴ See Temporary National Economic Committee, *Monograph No. 1*, "Price Behavior and Business Policy" (Washington, 1940), p. 15.

character of the market in which the firm operates, and by the kind of cost data available to executives. The meaning of price policy will be discussed presently.

Frequently it is necessary to examine with some care the administrative distribution of authority with regard to pricing—and this is the crucial point of the foregoing remarks. Typically in the large corporation the important price decisions are group decisions; they are made infrequently, while subordinates are charged with administering the customarily complex system of discounts, extras and other terms of sale which constitute the firm's price structure, with more or less discretion to make adjustments when necessary to secure or increase business.

The function of the entrepreneur in price theory is to choose among existing alternatives that line of action which will "maximize profits." Given the cost and demand functions, the price is supposed to follow as an automatic response. Nevertheless, in various recent formulations of pricing problems in monopolistically competitive markets the solution turns on whether the sellers are "aggressive" or "nonaggressive" competitors.⁵ The particular degree of "aggressiveness" that is to be assumed in a given case obviously presents a problem for price analysis. And this problem, furthermore, is one which may frequently be clarified by an examination of the market environment in which the firm operates, a matter to be discussed in the next section.

A second difficulty is connected with the time period over which profits are to be maximized. The ambiguity occasioned by the possibility of choice among several time periods may be removed by substituting, for "profit maximization," the maximization of the current value of the proprietorship interest in the firm. Since this current value will be affected by any change in anticipated net revenue, the magnitude to be maximized will reflect both short and long run considerations insofar as they enter into business expectations. This view not only represents a more general

⁵ See John Cassels, "Excess Capacity and Monopolistic Competition," *Quarterly Journal of Economics* (May 1937), p. 435.

and logically more acceptable formulation, but also for some purposes conforms to business habits of thought. However, the distinction between short and long run decisions must not be lost from view. In the field of empirical price analysis it is indispensable because it fits in with actual and observable differences in price decisions in a large number of business situations.

It is clear that empirical price analysis may, in certain circumstances, profitably include a detailed examination of the process of decision making in individual firms. A number of recent studies in this area have proved illuminating, and scattered through business literature are many contributions which repay investigation.⁶ Certain firms, by reason of their size, their strategic position in important industries, or the standing of their management personnel, carry exceptional weight in the business community. It is fair to say that an important price decision by the United States Steel Corporation will influence policies not only in the steel industry but in a much broader sector of the whole economy. The more important the firm in this respect, the greater is the value of a detailed study of its activities. This does not mean, however, that the sole or the most important focus of price analysis should be the activity of the individual firm. While there is much to be said for the logical position that each firm should be viewed as a limited monopoly, that a market can be understood clearly only in terms of the situation confronted by a firm, and that the industry is a technical conception without much utility for economic analysis, this view imposes unnecessarily stringent limitations on empirical price research. One of the essential problems of such research is to assign approximate magnitudes to price determining variables, which frequently means to distinguish between a 5 percent and a 50

⁶ In particular, see Homer Vanderblue, "Pricing Policies in the Automobile Industry," *Harvard Business Review* (Summer and Autumn numbers, 1939), and Temporary National Economic Committee, *Monograph No. 5*, Part II, "The International Harvester Company" (Washington, 1940).

percent "cause" of a given price change. For these purposes market and industrial data may well overshadow the influences peculiar to the position of any individual firm.

3. Price Policy

It has been indicated in preceding sections (a) that although the tools of analysis provided by price theory are useful in empirical research, particularly with regard to cost behavior, they are in some serious respects inadequate, and (b) that the response of price to changes in industrial market situations is ordinarily filtered through an administrative organization whose characteristics are frequently a proper subject of price research.

The inadequacies of our analytical tools for empirical price research are, perhaps, most conspicuous on the demand side. Although an appraisal of statistical efforts to calculate price elasticities for various products is not attempted here, it may be said that the results which command confidence have been limited for the most part to consumers' staple goods. One may, however, accept the facts that recent studies of producers' and consumers' durable goods have indicated low price elasticities⁷ and that multiple correlation attempts to explain changes over time in volumes of sales, production or employment in a large number of important industries⁸ have not ordinarily had to introduce price as an independent variable, as corroboration of the common business point of view that the short run demand for a large number of industrial products is probably inelastic. Shifts in demand curves appear to be much more important in explaining changes in volumes of sales of industrial products than price changes along a de-

⁷ See C. F. Roos and V. von Szeliski, "Factors Governing Changes in Domestic Automobile Demand" in *The Dynamics of Automobile Demand* (General Motors Corp., New York, 1939), and United States Steel Corporation, *T.N.E.C. Papers*, I, pp. 165-222 (New York, 1940).

⁸ See G. Means and L. Paradiso, *Patterns of Resource Use* (National Resources Committee, Washington, 1938).

mand curve. With respect to the demand situation which individual firms have to meet, there seems at present little possibility of a statistical calculation of demand elasticities except perhaps in markets exhibiting an unusually stable pattern of price relationships between the products sold by different firms in the market.

In view of the difficulties inherent in a statistical approximation of certain of the relationships which theorists consider relevant to price analysis, a resort to other, less rigorous, methods of empirical research appears to be desirable. Among these methods may be mentioned first, the attempt to discover through personal interviews with price making executives the premises with respect to cost or demand behavior on which executive action is based; and second, the effort to explain observed or defined "price policies" with reference to the structure of the market in which firms pursuing these policies operate.

As examples of the first method, the investigations into business behavior by various Oxford economists are perhaps to date the most successful.⁹ As for the market conditions under which the firms covered by these investigations operated, it was found that the "typical" case was the one in which the firm recognized that it was in competition with a few rivals selling products somewhat differentiated from its own (monopolistic competition with an admixture of oligopoly). Less important were the cases of monopolistic competition in which the firm assumed that its demand curve was independent of the reactions of its rivals. In the "typical" case the authors conclude that the enterprises in question held the opinion that a price reduction, but not a price increase, would be met by rivals, and that the demand for the product or group of products of all sellers was inelastic. Consequently the demand curve "imagined" by these firms, and on which they based their price action, shows a sharp break in elasticity at the pre-

⁹ In particular, R. L. Hall and C. J. Hitch, "Price Theory and Business Behavior," *Oxford Economic Papers*, No. 2.

vailing price.¹⁰ An increase above the prevailing price would lead to a large loss in sales, whereas a decrease in price would not increase sales very much.

There is no doubt that this is a realistic picture of the demand situation as envisaged by individual firms in a great number of industrial markets a large part of the time. It goes a long way toward explaining some important aspects of industrial price behavior. There is rather strong reason for believing that leading firms in the automobile, steel, agricultural implement, and many other industries act upon approximately this view of the situation. As a working hypothesis, however, it is probably limited to industrial markets which have attained something like long run stability in the sense that the demand is mainly for replacement and the entry of new firms is unimportant. Within these limits the hypothesis is probably not applicable in periods of very high or very low rates of output, nor is it likely to be illuminating if secret price cutting or disguised price changes through alterations in terms of sale are effective competitive devices. Finally, if the foremost firms in a market gain or lose business at a very unequal rate in depression and recovery, the pricing practices of these firms are not likely to conform closely to what would be expected on the basis of the above hypothesis.¹¹

In situations in which the products of different sellers are not close substitutes, firms may ordinarily be expected to gain or lose business at unequal rates. This is likely to be the case in markets which Messrs. Hall and Hitch describe

¹⁰ See also Paul Sweezy, "Demand Under Conditions of Oligopoly," *Journal of Political Economy* (August 1939). This possibility had been indicated earlier in an article by R. F. Kahn, "The Problem of Duopoly," *Economic Journal* (March 1937), pp. 8-9.

¹¹ In a number of markets in which there are only a few sellers and the product is fairly well standardized, each seller tends to pay close attention to trade association statistics indicating his share of the total sales. If this share is being maintained even though total sales are decreasing or increasing, the disposition is to maintain prices. On the other hand, a decline in a seller's share in the market may quickly lead to a direct, or more frequently, to a disguised, price cut, which will be followed by rival firms only when their share shows a tendency to fall off.

as monopolistic. "Interviews suggest," they note, "that in the case of certain luxury and fashion goods cross elasticities are negligible and competitors' reactions are ignored even when the number of firms is small."

In any market that is not purely competitive the seller does not ordinarily know his demand schedule. Nevertheless when he prices his product he must act upon certain assumptions respecting demand elasticity; empirical research along the lines of the Oxford inquiry may be expected to throw light on the character of these assumptions.

A term that has recently come into use among writers on marketing and industrial organization is "price policy."¹² This term implies that the firm does not adjust its price automatically to every change in expected demand or cost conditions, but follows a line of action that is expected to persist over time in spite of considerable change in market conditions. Price policy consequently becomes a price determining factor and a legitimate subject of empirical research. The policies may be objectively described in certain instances, though usually not in the detail an exacting observer would desire. Frequently the firm acts upon rules of thumb, or semi-articulated conventions whose scope is hard to define and impossible to detect in statistical price behavior. The firms studied by Messrs. Hall and Hitch which followed the "full cost principle" were pursuing a price policy, though in periods of very low or high rates of activity they tended to depart from it.¹³ Price stabilization, price discrimination, price decisions which rest upon what happens to a firm's share in the total market, may all be examples of price policy. If the scope of price decisions is defined to include terms of sale, the range of price policy is very broad indeed.

The effect of price policy upon price is the influence of a set of decisions made with reference to a larger environ-

¹² See E. G. Nourse, "The Meaning of Price Policy," *Quarterly Journal of Economics* (February 1941).

¹³ Hall and Hitch, *op. cit.*, p. 18.

ment than that embraced by customary changes in demand conditions. This does not mean, however, that price policies cannot be explained in large part with reference to the broader market environment in which the firm operates. Price policies may be part of an adjustment process at work in the economy and capable of being expressed in terms of economic relationships, even though price is not a quantity which automatically adjusts to changes in conventionally depicted cost and demand functions. In a recent article E. G. Nourse has sought to envisage price policy as an autonomous "personal" force operating on prices in ways which lie outside the capacity of any "market analysis," no matter how broad, to explain.¹⁴

Over a large area of actual price-making deterministic factors do not operate directly or are not completely controlling. With the emergence and growth of price discretion linked with control of large blocks of production facilities, these forces operate indirectly, subject to the evaluation, adaptation, and manipulation of strategically placed executives. A "market situation" is not an entity which enters into the price-making process in ways entirely predictable by rigorous logic or statistical methods. To a significant extent the "situation" is what the executive—endowed with a certain measure of understanding, substantial limits of discretion, and a considerable amount of control of resources—makes of it.¹⁵

It is probably true, and if true, it is extremely important, that in certain areas the personal force of outstanding executives has produced results through certain of their price policies which would not have eventuated had these executives been other men. The profit motive expressed by an-

¹⁴ E. G. Nourse, *op. cit.* Nourse explains, however, that "price policy cannot be usefully studied except as the accompaniment of meticulous analysis of market situations."

¹⁵ *Ibid.*, pp. 186-87. Nourse continues, "the price-making process, besides being examined as to the deterministic elements of the situations in which the executive must function, requires examination also as to the personal, intellectual, and temperamental qualities which he injects into the production and pricing process to give it its ultimate and effective form."

other personality but operating in the given environment would not have led to the same policy. In this connection the name of Henry Ford leaps to mind, associated as it was in the early stages of automobile manufacture with a policy of price reduction designed to promote mass production and consumption by pushing the use of the product into continually lower income levels. A policy of this sort has been the rule rather than the exception in new and expanding industries—a contemporary example is the rayon industry—and would appear to be more closely connected with the age of the industry than with the unusual personality of a company executive. When the automobile industry had apparently exhausted the possibilities of rapid expansion through price reduction in the mid-1920's, there was a discernible shift from a situation which can be loosely described as price competition to an emphasis on product competition within fairly well defined price ranges.

The debate concerning the relative importance of the individual and the environment, an old one in the field of social studies, is apt to be fruitless. The principal question from the point of view of empirical price research is whether definable price policies that vary from market to market and are of admitted influence on the behavior of prices in these markets can be explained in terms of the structure of the market in which they occur. If similar policies with reference to price or other areas of business decision can be shown to be associated ordinarily with similar types of market structure, price policies may be said to be amenable to economic explanation and will not have to be relegated to the realm of what is, from the economic point of view, accident.¹⁶

¹⁶ A listing of some of the elements which might be used for the construction of a classification of market structures is presented in a mimeographed pamphlet of the National Association of Manufacturers entitled "Prices and Price Determination in Manufacturing under the American Private Enterprise System." These elements are grouped under the general headings (1) Nature of the Product, (2) Nature of Supply Factors, (3) Nature of Demand, (4) Extent and Type of Government Control

Nourse, in the article mentioned above, would like to limit the meaning of price policy to the "constructive and innovating" contribution of the price-making executive.¹⁷ This concept seems, however, neither practicable nor useful for price research. It would appear preferable to limit the meaning of price policy to the general principles and rules, if any, that are employed by a firm in making price decisions, regardless of whether or not these principles are rationally explicable with reference to a market environment in which the firm operates. These principles will be applied in the large firm by its administrative officials, and price administration should mean, in general, the observance by subordinates of whatever rules with respect to price are laid down by the executives who determine price policy.

4. *Costs and Prices*

One of the important sets of data on which general principles relating to price making are based bears upon costs. What kinds of costs can and does the businessman know, and what account does he take of them in determining price? The firms investigated by Hall and Hitch, in default of knowledge of marginal revenue and marginal costs, appear in general to have followed what the authors call a "full cost principle."

In some cases this meant computing the full cost of a "given" commodity, and charging a price equal to cost. In others it meant working from some traditional or convenient price, which had been proved acceptable to consumers, and adjust-

or Regulation. Professor Mason was engaged, with D. H. Wallace, in working on an empirical classification of industrial market structures before both he and Dr. Wallace were drawn into the work of war agencies.

¹⁷ E. G. Nourse, *op. cit.*, p. 187, footnote 8. "Thus price policy is not co-extensive with price administration but is the personal as distinct from the impersonal aspect of that process. It cannot even be deduced from the study of the impersonal part, i.e., market situations."

ing the quality of the article until its full cost equalled the "given" price.¹⁸

Obviously "full cost" is not an unambiguous concept. Both the items included and the way they are calculated will vary between firms and industries. Furthermore, the application of a full cost principle is limited—as Hall and Hitch would presumably admit—to particular kinds of product markets. The relation of purchase to sale, and the cost calculation relevant to pricing, will vary markedly as between organized markets subjected to trading regulations, markets in which products are produced for sale to any buyer who will pay the price, markets in which bids for a specified article are asked by a given buyer from prospective sellers, markets in which supply contracts are negotiated with individual sellers on a fixed price basis, and markets in which supply contracts are negotiated on a cost-plus basis.¹⁹

Although various versions of the "full cost principle" are used by a large number of firms as a basis for pricing, at least in periods of good business, it would be a mistake to conclude that a calculation or estimate of something approximating the economist's marginal cost is of infrequent occurrence in business practice. In certain cases, discussed at length in previous chapters, it is possible to calculate the short run cost function for a particular product statistically.²⁰ There is no doubt, moreover, that refinements of

¹⁸ *Op. cit.*, p. 18. Full cost as used here is defined as follows: "Prime (or 'direct') cost per unit is taken as the base, a percentage is made to cover overheads (or 'oncost,' or 'indirect' cost), and a further conventional addition (frequently 10 percent) is made for profit. Selling costs commonly and interest on capital rarely are included in overheads; when not so included they are allowed for in the addition for profits."

¹⁹ Supply contracts negotiated on a cost-plus basis are much more frequent in private business than is ordinarily supposed.

²⁰ Although the examples with which economists are acquainted are those supplied by academic economists or statisticians, a familiarity with business practice would reveal a large number of attempts at a careful study of the relation of rate of output to cost. Certain cotton textile mills producing single standardized products, e.g., denims, ducks and wide sheeting, have undertaken such calculations.

cost accounting and cost analysis have as an important focus the relation of rates of output to costs. In many firms which make no attempt to calculate cost functions for particular products, these functions are calculated or estimated for particular operations or particular subproducts. The specific costs calculated by International Harvester and used as the basis of decision to produce or to purchase parts for various agricultural implements may be taken as an example.

The estimation of added cost of added output appears to be particularly common in production on a job or contract basis. A paper company in Massachusetts was asked by a buyer with an inferior credit rating to bid on a large lot of paper. The company calculated carefully what its net loss would be in case the customer failed to pay and submitted a bid calling for a cash payment covering the calculated net loss and the remainder of the price on the usual credit terms. Again, a job printer in Washington submitted a bid for a printing contract which included no labor cost; the existing labor force could carry the additional business without an increase in hours of employment. Many other examples of specific attempts to calculate what an economist would call marginal costs might be cited from business practice.

In many cases the business executive makes adjustments in the cost data supplied him by the accountant, adjustments which represent a judgment based on the executive's business experience of what, in view of the accounting figures, the extra cost of an addition to output is likely to be. In other cases although the firm may make no attempt to estimate marginal costs, it follows practices which tend to produce much the same result as would follow from a conscious attempt to estimate marginal costs and marginal revenue. A large book-paper firm, producing a number of classes of paper, bases its pricing upon something approximating the "full cost principle" described by Hall and Hitch. On this basis the different product classes show different "trading profits," and the firm is constantly attempt-

ing to rid itself of items showing low trading profits in favor of those which show higher profits. Obviously there are many influences on costs and revenue, as envisaged in economic analysis, that cannot be taken into account completely; but the process of selection and rejection here followed may well lead to a fair approximation of the maximum profit position aimed at in an estimation of marginal costs and revenue.

In a consideration of the relation of accounting costs to pricing one must, of course, recognize the fact that in a large part of the business world nothing deserving the name of cost accounts exists. Even in areas in which costs are kept the reported costs of identical items may vary amazingly between firms. During the period of the National Recovery Administration evidence presented concerning the paint industry showed that the range of cost variation for identical items was between 500 and 600 percent. In fields in which no cost accounts, or at best very sketchy ones, exist, the business executive may nevertheless estimate from his own intimate experience the added cost of an increase in output and apply such measures in his pricing and production decisions. More frequently, in all probability, he utilizes a rough rule of thumb, as a retailer does when he adds a uniform markup to all items in his store.

Recognizing that it is extraordinarily difficult and in many cases impossible in actual business practice to calculate cost functions for individual products, observers have attempted to explain the relation between costs and prices in various other ways. Some, while admitting the irrelevance of accounting costs to the economist's cost functions, have insisted that business executives and their production managers can and do estimate with fair accuracy the economic costs applicable to a rational pricing policy. Others tend to deny that costs have any important price-determining function except in the (very long run) sense that a failure of price to cover costs may eventually reduce supplies or that high profits may lead to the entry of new

firms. In a shorter period costs are, according to this view, more frequently a rationalization than a determinant of price.²¹ Still others maintain that although the cost functions of economic analysis are not relevant to prices, accounting cost formulas and rules do serve as a basis for pricing. Abundant examples can be adduced to support each of these points of view, and there is little doubt that in the lifetime of a moderately large concern price decisions have been made in which costs have played each of these roles.

It is clear from a number of recent studies of large firms producing for sale (rather than to specification) that, for the firms studied, the economist's long run cost function more nearly approximates the costs that are taken into account in pricing than does the short run cost function. The standard cost calculations of General Motors and International Harvester are unit costs which, at standard volume of output (with respect to which the plant and equipment were presumably designed) and in the absence of changes in wage rates, material costs or factor efficiencies, may be expected to recapture the plant investment within its conservatively anticipated lifetime. This is one version of the full cost principle of Hall and Hitch, and it would seem to be in fairly wide use among business firms in this country as well as in England. The conventional accounting allocations of investment over time and of indirect costs among products must be arbitrary from an economic point of

²¹ See Walton Hamilton, *Price and Price Policy* (McGraw-Hill, 1938), pp. 536-43, for a forceful statement of this attitude.

"The charges for a theatre ticket, a tube of toothpaste, or a checking account at the bank do not accord with the necessary expenses which attend them. The factory cost of a package of cigarettes is only a fraction of the price the buyer pays; and if the 6 cents in taxes is subtracted, the larger part of the residue still remains unexplained. A number of items can be made to account for the difference; but such expenses as high salaries, bonuses to management, and advertising are made possible by the spread. Their source lies in the ability of the concern to pay. Eventually they become established in the industry and are set down as costs. As a concern goes its way a continuing deficit forces reorganization or bankruptcy or somehow gets written off; and an assured surplus is appropriated and rationalized as an ordinary expense" (p. 538).

view, but the resulting unit costs are closer to the economist's long run, than to his short run, costs.

The use of standard costs in pricing is limited to certain types of markets, and within these markets the emergence of a new firm, the introduction of new techniques of production or marketing, or the financial weakness of certain of the existing firms may well disrupt established pricing techniques. Among a considerable number of industrial firms there appears, however, to be rather common use of standard cost, at least as a first approximation in price decisions. When prices conform to standard costs (with or without the addition of a trading profit) prices will tend to respond to changes in factor prices or efficiencies, but not to changes in volume of sales.

5. *The Field of Cost-Price Research*

In preceding chapters the discussion of particular aspects of cost behavior has been accompanied by an attempt at evaluation of further research possibilities. The empirical study of cost behavior and of cost-price relationships may be supposed to be of particular interest to the individual firm concerned with profit making, to the economist seeking an understanding of how the economy functions and to those whose province is the formulation and administration of public policies. To focus attention on these interests is not to deny that accountants, trade association officials and other groups have also a special interest of their own in cost-price studies.

For the individual firm, attempts to gauge the behavior of costs and revenue are implicit in every important business decision. In progressive American firms there is fairly frequent recourse to statistical studies and to careful engineering estimates of the relation to costs of location, size of plant, rate of output, change in wage rates and material prices, technical innovations, size of order, modifications of style and other variables, and of the relation to revenue of various types of advertising expenditures, discount struc-

tures, marketing methods and price changes. These studies constitute an important body of material which is relatively unknown to economists outside the firms in question and is, of course, frequently difficult of access. Needless to say, the publication of these data would contribute greatly to an understanding of current business practice and to the general functioning of the economy. The central problem in all these studies has provided the main thread connecting the various chapters in this volume: the problem of isolating the effect on cost (or revenue) of changes in one of many variables. Changes in cost accounting techniques and the application of the tools of economic analysis have made progress within the bounds of this problem area, and there is reason to believe that the empirical study of cost and revenue functions in the individual firm will continue to develop.

Somewhat paradoxically, the analytical tools of price theory are probably less useful to the economist or the government controller who seeks an explanation of price behavior than to the individual firm which strives to improve its profit position. For one thing, the data necessary to an empirical derivation of cost and demand functions are less accessible to the observer. Again, the problem is not merely one of an individual firm's adjustment to technical and market conditions; it concerns the interrelationships between firms in a market which is hard to define. Finally, account must be taken of the conventions, rules and administrative practices to be found in every concrete market situation. One of the principal tasks of empirical price research is to evaluate the magnitude of various "causes" of price change and to estimate from changes in these "causes" the probable effect on prices. The factual materials available usually include data relating to relatively broad classes of commodities, some data on the operations of important individual firms, and institutional and technical material of a more or less relevant character. Given such an assortment, he who undertakes empirical research must of necessity choose an eclectic approach.

APPENDIX A

COST STUDIES UNDERTAKEN BY
THE FEDERAL GOVERNMENT

