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### ORGANIZATIONAL FACTORS IN THE THEORY OF OLIGOPOLY\*

#### By R. M. CYERT AND JAMES G. MARCH

Introduction, 44. — I. Motivational assumptions, 46. — II. The planning process, 49. — III. Organizational slack, 53. — IV. Empirical relevance, 55. — V. Theoretical relevance, 58. — VI. Summary, 62.

The theory of the firm as it exists in present economic literature is a deductive system based on assumptions of human motivation that appear doubtful in the light of present day psychology, and on assumptions of organizational behavior that are implausible. Working with such a system, the economist derives theorems which are frequently not testable. Further, the theory is in a form which effectively bars any empirical investigation which might result in improvement through modifications. The unhappy position of the economist working in the area of the theory of the firm has been aptly described by M. J. Farrell. "On the one hand, we may make specific assumptions quite arbitrarily, and with scant regard for their plausibility, and arrive at specific conclusions which, however, will accord with the facts, if at all, only by chance; this method is typified by the imperfect competition theories. On the other hand, we may make our assumptions so general that they take account of all those factors which seem a priori to be relevant, and derive conclusions which although very likely to be true, are so vague and general that they are of little practical use. This is the method of some of the more sophisticated mathematical theorists."1

The focus of this paper is on oligopolistic firms. A distinctive feature of current oligopoly theory is the absence of any propositions that explain the *process* by which decisions on such important variables as price, selling outlay, and type of product are made by the firm. The existing models all assume that once the values of the conjectural variation terms are given the firm can then determine the

\* A version of this paper was read at the Conference on Trends in Economics, University Park, Pennsylvania, June 17, 1955. It is based in part on work done under a grant made to the Carnegie Institute of Technology by the Ford Foundation for the study of organization theory.

1. M. J. Farrell, "Deductive Systems and Empirical Generalizations in the Theory of the Firm," Oxford Economic Papers, No. 4 (1952), pp. 45-49, at pp. 48-49.

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proper policies so as to maximize profits. The models generally ignore the amount of uncertainty surrounding not only the conjectural variation terms but also other items such as market demand and production cost functions.

In an earlier paper the manner in which the organizational structure itself could influence price decisions was analyzed.<sup>2</sup> The present paper is an attempt to explore other features of organizational decision-making of relevance for a theory of oligopoly. While the importance of the external environment for the behavior of oligopolistic firms is not denied, the attempt is to describe factors related to the internal organization which seem relevant for an empirically oriented theory of oligopoly. A general theory of the firm will have to contain variables related both to the external environment and the The perfect competition case may then be internal organization. viewed as a special case in which the external factors are so important to the firm's decision-making processes that the internal organization is of little significance. At the other extreme, monopoly may be a special case in which only the internal organization variables have relevance. Such a general theory, however, seems quite remote at this point.

In four respects the model outlined here deviates from standard formulations. First, with respect to the motivations of individuals acting within their roles in a business organization, the entrepreneurial imperative of profit maximization is replaced by the concept of an acceptable level of profits. In contrast with profit maximization, the acceptable-level concept implies a specific profit goal. This change in the behavior assumption is based partly on a doubt as to the empirical validity of the maximizing characterization of human behavior and in part on an examination of the difficulties involved in any attempt to attain maximum profits in an organization. As will become clear below, the techniques of management control (e.g., setting minimum standards of behavior) themselves tend to induce firm behavior more consistent with the acceptable-level concept than with the profit maximizing notion.

Second, the consideration of organizations as decision-making systems leads to an evaluation of the impact of planning procedures on the behavior of firms. In particular, it seems important to introduce the stabilizing effects of the planning and budgeting process

2. R. M. Cyert and J. G. March, "Organizational Structure and Pricing Behavior in an Oligopolistic Market," *American Economic Review*, XLV (March 1955), 129-39.

explicitly into the theory. In the ways that will be indicated below, a budget serves to set operational norms for the participants in an organization, and the present model seeks to exploit these systematic consequences of budgeting and planning procedures.

Third, the model considered here recognizes the fact that a business firm consists of a series of component subunits (e.g., divisions, departments, or smaller work groups). The needs and desires of these subunits must be taken into account in the planning of the firm even though a cost is involved. The allocation of organizational resources to the satisfaction of subunits in excess of the minimum required for maintenance of the system gives rise to a form of organizational slack. Consequently, the firm is in a position to exert pressure on the subunits when the goals of the firm itself are in danger.

Fourth, in contrast to the traditional model, specific decision rules are not presented in the present model. It is believed that decision rules must have an empirical basis and that they cannot be derived by deduction. The absence of decision rules is one of the facts which prevents the model described in this paper from being a complete model.

### I. MOTIVATIONAL ASSUMPTIONS

There has been a great deal of dissatisfaction among economists for many years over the assumption of profit maximization in the theory of the firm.<sup>3</sup> In many cases the attack on profit maximization has been made on grounds only potentially justifiable. For some purposes, the critical test of a set of assumptions is not whether they conform closely to observations of reality at a molecular level of analysis but rather whether propositions that are empirically valid can be deduced from them. On the other hand, one should avoid assuming that aggregation will solve all of the flaws of sloppy molecular theory and that, therefore, one need have no concern for the independent validation of such assumptions. In addition, we can legitimately require of a model that it permit the analysis of a substantial number of significant problems.

The position taken here is that a model more fruitful than the classical one can be devised by forsaking the profit maximization

3. See, for example, R. A. Gordon, "Short-Period Price Determination," American Economic Review, XXXVIII (June 1948), 265-88; K. W. Rothschild, "Price Theory and Oligopoly," Economic Journal, LVII (Sept. 1947), 299-320; and R. L. Hall and C. J. Hitch, "Price Theory and Business Behavior," Oxford Economic Papers, No. 2 (1939).

assumption. For profit maximization we substitute the concept of an acceptable-level profit norm.<sup>4</sup> The objective of the firm is to attain a satisfactory level of profits. This satisfactory level is defined in terms of past experience and outside standards of comparison in ways that will be discussed briefly below.

Such a characterization of a firm's motivations seems to be indicated by two types of research data that are available. First, research on individual behavior in explicitly maximizing situations with minimum constraints imposed by competing goals shows a tendency toward goal-setting of the acceptable-level kind. Typically an alternative criterion for evaluation (i.e., other than maximization) seriously restricts the extent of conformance to the maximizing goal.<sup>5</sup> Similarly, some recent attempts to formalize the decision-making activities of human beings have avoided the maximization assumption.<sup>6</sup>

On the other hand, the evidence at the individual level, while generally consistent with an aspiration level concept such as we have defined is not so unambiguous as to be explainable by such a theory only. Nor do we wish to argue that the significance of the acceptable level concept for organization theory depends solely on its justification at the level of individual psychology. Organizational decisions depend in part on the relationship between the needs of individual participants in the organization and organizational goals. Thus, even if individuals maximize pleasure or expected utility, it does not necessarily follow that organizations maximize profits. Likewise, even if individuals do not maximize, it does not necessarily follow that organizations do not. Independent evidence and explanations for organizational behavior are required.

4. In sociological terms, we propose the substitution of an attainable-ideal norm concept for an unattainable-ideal concept. For a discussion of the distinction, see J. G. March, "Group Norms and the Active Minority," American Sociological Review, XIX (Dec. 1954), pp. 733-41.

5. Consider, for example, the following experimental situation. A group of subjects participate in a game involving a target and a device for hitting the target (e.g., darts, a long stick-like apparatus). The object of the game, they are told, is to come as close as possible to the target bull's-eye. The score they receive will be the sum of the distances between hits and the center of the target. The situation, therefore, is explicitly maximizing (literally minimizing). With considerable (though not complete) consistency the scores of subjects placed in such a situation vary directly with the outside dimensions of the target circle. See R. H. Day, "The Effect of Size of Target on Accuracy of Aim," American Journal of Psychology, LXVII (Oct. 1954), 659-67, and the articles cited there.

6. For example, see H. A. Simon, "A Behavioral Model of Rational Choice," this *Journal*, LXIX (Feb. 1955), pp. 99–118; J. G. March, "An Introduction to the Theory and Measurement of Influence," *American Political Science Review*, LXIX (June 1955).

Within the profit maximization model it is difficult to explain a For example. number of attributes of organizational behavior. Gouldner has found that under very general conditions management is compelled to formulate rules of behavior that implicitly (if not explicitly) specify minimum acceptable behavior for employees and that actual behavior tends to approximate such a minimum.<sup>7</sup> Mann and Baumgartel have found that the concern of lower management with costs (a concern that seems indispensable to a maximizing organization) is a variable depending on an assortment of factors such as age of the supervisor and the extent to which he feels organization decisions reflect his participation — as well as pressure from superiors.<sup>8</sup> Selznick has shown how the activities and goals of an organization tend to be deflected by the goals of subunits.<sup>9</sup> Lane has found that the weaker the financial position of the firm, the greater the propensity to violate governmental regulatory provisions; yet there is no evidence to suggest that violations of this sort are any less advantageous (in an absolute sense) to the strong firm than to the weak.<sup>1</sup> Results such as these and others indicated below with respect to budgeting and control procedures warrant more than the usual dismissal as deviant cases.

The concept of an attainable and acceptable profit level rather than profit maximization is clearly not a new idea to either the literature of economics or the literature of organization theory. Chamberlin, for example, in *Monopolistic Competition* used the concept of "ordinary rather than maximum" profits to demonstrate one set of conditions that could lead to an equilibrium position with excess capacity.<sup>2</sup> Rothschild introduced the concept of survival in an article on oligopoly in 1947.<sup>3</sup> Such a concept is clearly consistent with the argument made here. Dean has used a somewhat similar notion and has listed some criteria which may determine the profit level defined as "satisfactory."<sup>4</sup> Gordon has suggested explicitly the use of the concept of

7. A. W. Gouldner, Patterns of Industrial Bureaucracy (Glencoe, 1954), esp. pp. 174-76.

8. F. Mann and H. Baumgartel, The Supervisor's Concern with Costs in an Electric Power Company (Ann Arbor, 1953).

9. P. Selznick, TVA and the Grass Roots (Berkeley, 1949).

1. R. E. Lane, "Why Businessmen Violate the Law," Journal of Criminal Law, Criminology and Police Science, XLIV (July-Aug. 1953), 151-65.

2. E. H. Chamberlin, The Theory of Monopolistic Competition, pp. 105-6. For a more complete statement of Chamberlin's position, see "Full Cost and Monopolistic Competition," *Economic Journal*, LXII (June 1952), pp. 318-25.

3. Rothschild, op. cit.

4. Joel Dean, Managerial Economics (New York, 1951), pp. 34-39; see also Gordon, op. cit.

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satisfactory profits.<sup>5</sup> However, such reformulations, including the "full cost" principle, have had little impact on economic theory as a whole.

The replacement of profit maximization by some form of an acceptable profit level seems warranted in terms of our knowledge of individual and organizational behavior. More important, however, the use of such assumptions exposes possible solutions to problems that have frustrated economists working within the maximizing framework. Important among these problems are the methods by which a firm makes decisions on price, output, product design, and selling costs in a market distinguished by interdependence among firms. Related to such problems are the methods by which a firm moves from the decisions and outcomes of one period to the decisions of the next, and the ability of a firm to manipulate organizational variables to balance an adverse environment.

### II. The Planning Process

The process of planning within the firm tends to be obscured by the assumptions made in traditional economic theory. If demand and cost functions are known and if a value can be specified for the conjectural variation term, then optimum price, output, style, and advertising policies can be quickly computed. However, when uncertainty with respect to any of these variables is introduced and the profit maximizing assumption is supplanted, the problem and implications of planning take on a new perspective. It becomes important to inquire how a firm makes estimates of the relevant variables, how organizational characteristics systematically affect estimates, how the organization operates within a framework of uncertainty, and how the firm is able to manipulate the organizational factors impinging on its competitive position.

Some hypotheses concerning the first two of these questions have been suggested in an earlier paper in which an attempt was made to relate organizational factors to the estimation and perception of cost, demand, firm policy, and the reaction of rivals.<sup>6</sup> Consequently, such factors will not be explored here. It should be enough to observe that it seems highly unlikely that an adequate theory of oligopoly can be created without careful attention to the idiosyncrasies of large scale organizations as information-processing instruments.

However, the significance of the planning process is not limited

- 5. Gordon, op. cit., p. 271.
- 6. Cyert and March. op. cit.

to such features of organizational behavior. The fact that plans are made, and the fact that there are features of periodicity characterizing the plans, enforces types of activities inadequately considered in traditional economic literature.

Central to our conception of firm behavior in planning is the phenomenon of budgeting. The budget in a modern, large-scale corporation plays two basic roles. On the one hand, it is used as a management control device to implement policies on which the firm has decided and to check achievement against established criteria. On the other hand, a budget is a device to determine feasible programs. In either case, it tends to define — in advance — a set of fixed commitments and (perhaps more important) fixed expectations. Although budgets can be flexible, they cannot help but result in the specification of a framework within which the firm will operate, evaluate its success, and later its program. Typically, for example, one of the characteristics of a budget period in an oligopolistic firm is that it covers the period for which the firm considers prices fixed. Similarly, any budget tends to identify as "givens" some factors that are in an absolute sense "variables" within the control of the organization.<sup>7</sup>

In addition, it is important to make four general observations:

First, a budget is a prediction. In classical economics the importance of budgetary predictions is obscured by the assumption that the predictions are always correct (and correct without benefit of an interaction between the prediction itself and firm behavior). Outside of such a utopia of perspicacity, a budgetary prediction functions both as a prediction of sales, costs, profit level, etc., and also as a goal for such factors. As will be indicated below, under some circumstances (and within limits) an organization can induce behavior designed to confirm its prediction. However, the limits have to be estimated in advance by the firm and predictions can be low with respect to firm potential. Consequently, the confirmed prediction may be less than the optimal solution of classical economics.

Second, a budget is a schedule. It specifies intermediate steps to a predicted outcome. Such guides take the form of both time goals and subunit goals and need not be fixed completely in advance. Frequently, however, they are either fixed absolutely or in terms of a ratio to a factor (e.g., sales) that is considered exogenously variable. In any event, the firm is forced by its budget (if for no other reason) into the specification of acceptable achievement levels for its subunits

7. G. Royer, "Performance Yardsticks for Sales Management," National Association of Cost Accountants Bulletin, XXXV (Nov. 1953), 311-20.

as well as for the organization as a whole, for segments of the budgeting period as well as for the period as a whole.

Third, a budget is a theory. The budget plan specifies a relationship between such factors as sales and costs on the one hand and profits on the other, and thereby permits the use of sales and cost data as guideposts to the achievement of a satisfactory level of profits. Thus, although monthly profit and loss statements and/or departmental profit and loss statements are frequently used in firms, their use is neither so widespread nor so significant as one might anticipate. Because of the accounting difficulties involved in partial profit and loss statements (particularly with respect to burden application) many operating executives appear to prefer other, budget-oriented, criteria of performance. A recent study of some 400 executives in seven large firms reports: "Managers were frequently found applying such rules of thumb: 'We will do all right if we can keep the manufacturing cost down to  $X_{1}^{\alpha}$  of the sales price.' "<sup>8</sup>

It is our contention that budgeting and the use of intermediate goals tend to eliminate continuous re-examination of profit (or other) goals and to enforce upon the organization the budgetary norms determined at periodic intervals.

Fourth, a budget is a precedent. It defines the decisions of one year and thereby establishes a prima facie case for continuing existing expenditures. Only in quite exceptional cases do firms in fact re-examine the rationale of existing functions, for example, or alter radically the expenditures for them. This tends to be particularly true of overhead functions (e.g., advertising, research and development, clerical help). Moreover, profits or sales in one period tend to become criteria for the next. As a result a firm only gradually shifts its plans and only at the margin can it make maximizing calculations.

Some of the reasons why a budget operates as a precedent are clear when one considers the determinants of aspiration level behavior. Experimental work on aspiration levels has consistently shown that self-determined individual goals for time  $t_1$  are a function of an individual's achievement at  $t_0$  and his perception of the achievement of others.<sup>9</sup> In the case of the budget this means that budgetary appro-

8. H. A. Simon, H. Guetzkow, G. Kozmetsky, and G. Tyndall, Centralization vs. Decentralization in Organizing the Controller's Department (New York, 1954), p. 42.

9. J. R. Simon, M. E. Shaw, J. C. Gilchrist, "Some Effects of Pre-Arranged Performance Scores upon the Level of Aspiration," *Journal of Experimental Psychology*, XLVII (Jan. 1954), 10–12; K. Lewin, T. Dembo, L. Festinger, P. S. Sears, "Level of Aspiration" in *Personality and the Behavior Disorders*, ed. J. (cont.)

priations of one year (plus grants in other firms or to other departments in the same firm) tend to define departmental base goals for the next period. Since substantial satisfaction of subunits is a necessary cost of operation, downward budgetary adjustments are difficult to make.

In addition, a similar phenomenon accentuates the precedent tendency. Top management in the firm (and stockholders) form expectations and aspirations with regard to profit. Such expectations and aspirations are presumably subject to the same aspiration-level propositions previously indicated. So long as the profit level and sales continue to be satisfactory, budgetary decisions are exceptionally dependent on decisions of previous years with shifts tending to reflect the expansionist inclinations of subunits rather than systematic reviews by top management.

For example, a recent study of research spending over a ten-year period in five large firms reveals that resistance to a general upward trend in research and development expenditures operates only in years following decreases in both dollar sales and net profits, as indicated in Table I below. (The differences between the situation where both sales and profit are down and the two other situations are significant at the .025 and .01 levels of significance respectively.)<sup>1</sup>

Outcome of previous year	Expenditures for research Decrease from previous year Increase from previous year			
Both dollar sales and net profit down	3	3		
Either dollar sales or net profit down, but not bot	0 h	13		
Neither dollar sales nor ne profit down	t O	21		

TABLE I

CHANGES IN RESEARCH SPENDING ACCORDING TO SALES AND PROFIT EXPERIENCE OF PRECEDING YEAR

McV. Hunt (New York, 1944), I, 333-78; L. Festinger, "A Theory of Social Comparison Processes," Human Relations, VII (May 1954), 117-40.

1. The table and analysis are based on data secured in a different connection by DeWitt Dearborn and shortly to be published by him. They are taken from the annual reports of General Foods, Hercules Powder, Owens-Illinois Glass, Squibb and Sons, and Standard Oil of New Jersey. We wish to acknowledge specifically our debt to Mr. Dearborn for allowing us access to his raw data. The test for significance is Fisher's exact method. See R. A. Fisher, *Statistical Methods* for Research Workers (8th ed.; New York, 1941), pp. 94–97.

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#### III. ORGANIZATIONAL SLACK

It has been argued above that as long as an acceptable profit level is maintained, changes in operative procedures tend to reflect acquiescence to pressures by subunits or small marginal shifts. However, one of the more important questions for oligopoly theory arises where there is a failure or impending failure to realize desired goals. The actual behavior of firms in such a situation seems to indicate the desirability of introducing into organizational and economic theory a concept that we shall call organizational slack.

Suppose the firm's current indicators show that acceptable levels of sales and/or profits are not being achieved. Suppose further that certain of the variables entering into the calculations of the firm may have to be viewed as fixed once the firm is in the operating period. An obvious example in an oligopoly is the case of price. It is generally true that once price is announced, a firm prefers — or feels it is necessary — to keep it fixed until some definite event (e.g., a new model, conventional date) takes place. Rectification of an adverse situation by price adjustments is discouraged. Another example of a variable that is frequently fixed for the duration of the operating period is product style and design.

Given such conditions, it becomes difficult for the firm to manipulate the price and style conditions so as to achieve its plan. However, there seems to be some evidence that under such circumstances the firm is able to take up slack in certain parts of its organization which may make it possible to achieve its goals.

It is also clear, however, that the organization cannot engage in such activities too frequently or too vigorously. The existence of organizational slack appears to imply that significant amounts of individual energies potentially utilizable by the organization are, in fact, being directed to the satisfaction of other roles (e.g., clique member, husband) within which individual members of the business organization operate. Clearly, the minimum satisfaction of such other demands as is necessary to retain an employee are costs to the organization; but note that the minimum is defined not by the firm but by the employee. It depends on the aspirations of the organization member and on his perception of alternatives before him. Thus, it is (at least in part) a function of the firm's profit position (a partial determinant of aspiration level) and the potential interorganizational mobility of the employee. Consequently, activities that represent slack at one time may represent necessary costs at another, and one of the tactics of managerial control is the manipulation of perceptions held with respect to the state of the organization.

One example of the phenomenon being discussed appears to be the relationship existing between the automobile manufacturers and their dealers. It is well known that the manufacturers can force the dealers to accept more cars than the dealers may wish to accept.<sup>2</sup> The net result of such a situation is that the manufacturers may be able to fulfill their own plans at the expense of the dealers — or able to force the dealers into new activities in order to achieve dealer goals.

Another example of taking up the slack in an organization can be found in the area of cost reduction. Under the pressure of attaining its goals with the restrictions imposed by the market, the firm may be forced to re-examine its internal structure. Under such circumstances, the firm frequently finds that it is possible to reduce costs.<sup>3</sup> The reduction may take the form of increased managerial control which results in the same operating procedures being accomplished at a lower cost. Or the firm may, while under the pressure, adopt new techniques of a managerial or technological nature.

Some economists will object to the notion of organizational slack on the grounds that such a concept implies a "nonrational" firm. It might be argued that if the opportunities had existed for increasing profits, the firm would have exploited these opportunities previously. A partial answer to this point lies, of course, in the observations made above with respect to the extent to which organizational slack is a function of the firm's success. However, the major answer is that these opportunities do not enter into the firm's perceptions until some form of shock (such as failing to meet its goals) forces a kind of search behavior on the organization. Typically, the firm does not look at all possible alternatives before developing its plans. The planning function is satisfied when a program that appears to be feasible can be devised. It is certainly clear, for example, that all executive personnel are not evaluated at each planning session to determine whether an improvement can be made. Certain elements in the organization are considered fixed for planning purposes until such time as external factors necessitate search activity. Such activity results in viewing previously fixed factors as variable and determining whether changes will result in increased profitability.

That such a situation is typical of many firms seems to be indicated by a review of the literature on budgeting. On the cost side it represents what Hartogensis has called "cost reduction by brute

<sup>2.</sup> Report on Motor Vehicle Industry, 76th Congress, 1st Session, House Doc. 468, pp. 155-72.

<sup>3.</sup> See A. M. Hartogensis, "Cost Reduction by Brute Force," N.A.C.A. Bulletin, XXXV (Nov. 1953), 344-50. WWW.irpublicpolicy.ir

force." He cites an example of a firm that was able under the pressure of an adverse situation and a profit goal to reduce its production control staff from 500 to 350 over a weekend without serious difficulty.<sup>4</sup> Recent writings in the field of budgeting have discussed "budgeting for profits first"<sup>5</sup> and "profit control,"<sup>6</sup> concepts that clearly fit in with our conception of organizational behavior. The following passage (which is representative of the volume) is taken from a recent budgeting "primer": "... the forecasted profit as finally determined by striking a proper balance between sales, costs and expenses, must be compared with the minimum profit [i.e., acceptable profit] which has been computed independently. Should the forecasted profit be less than the minimum profit, the management will have to determine what additional steps must be taken to correct such a situation."<sup>7</sup> As one peruses the literature, one is impressed by the extent to which rules for search behavior typically follow some introduction such as "When net losses crop up or when profits are not satisfactory. . . . "<sup>8</sup> Such comments seem to assume (and frequently give evidence of) both the existence of organizational slack and the importance of the acceptable level of profits as a day-to-day working principle.

#### IV. Empirical Relevance

It may be objected at this point that the propositions advanced above, while possibly sound, do not lead to specific predictions of firm behavior except in a most general sense. However, there is every reason to believe that testing the empirical relevance of the framework presented here is feasible and that the predictions to be made are neither trivial nor obvious.

As an example of the type of analysis and predictions that may be possible, consider the following data on seven firms engaged in the manufacture of farm implements.<sup>9</sup>

4. Hartogensis, op. cit.

5. J. H. MacDonald, Practical Budget Procedure, pp. 9-13.

6. H. A. Greene, "Planning for Profit Control When Volume Changes," N.A.C.A. Bulletin, XXXV (Nov. 1953), 291-99.

7. C. O. Wellington, A Primer on Budgeting, p. 77. Emphasis added.

8. J. B. Heckert and J. D. Willson, *Controllership* (New York, 1952), p. 368. Consider also, in this regard, Gleason's unhappy observation that "all too frequently, company managements go along complacently with costs higher than necessary, so long as the company is earning what they have accepted as a satisfactory profit." C. H. Gleason, "An Organized Profit Improvement Program," N.A.C.A. Bulletin, XXXII (Oct. 1950), 123-31, at p. 123.

9. The data are taken from F. V. Gardner, "The New Meaning of Breakeven Points" in *Production Costs and Breakeven Points*, American Management Association, Production Series Number 177 (New York, 1948), Schedule B. Since a substantial number of Gardner's percentage figures do not appear to be correct WWW.irpublicpolicy.ir

OF FARM IMPLEMENTS					
Firm	Average 1935–1939 shipments	Prewar break- even point	Prewar variable costs per \$1.00 net sales	1946 shipments	Postwar variable costs per \$1.00 net sales
Α	22,337	\$18,800	\$0.690	\$38,246	\$0.750
в	70,884	44,000	.660	132,841	.710
$\mathbf{C}$	12,896	12,500	.705	31,874	.795
D	25,090	24,500	.755	50,840	.780
$\mathbf{E}$	67,373	50,000	.800	93,840	.795
$\mathbf{F}$	52,085	34,600	.740	128,400	.846
G	274,767	200,000	.700	482,328	.815

#### TABLE II Shipments and Variable Costs of Seven Manufacturers of Farm Implements

According to our analysis, a firm that finds itself with an unsatisfactory profit record will seek to reduce costs, or expand sales, or both. Firms having both a satisfactory profit record and a satisfactory cost history (compared with competitors) will not be so likely to search for new sales opportunities as will firms having either unsatisfactory profits or unsatisfactory costs; and firms having unsatisfactory records on both profits and costs will be those most likely to search for new sales possibilities. Thus, we make a prediction that ranks firms with respect to sales expansion in the following order:

1. Firms having both unsatisfactory profits and unsatisfactory costs.

2. Firms having either unsatisfactory profits or unsatisfactory costs.

3. Firms having neither unsatisfactory profits nor unsatisfactory costs.

To test the prediction, we can establish the following empirical criteria for unsatisfactory profit and cost histories:

(a) Unsatisfactory profit history. An unsatisfactory profit will be assumed if the ratio of prewar shipments (in dollars) to the prewar breakeven point for the firm is less than 1.10. The 1.10 figure is arbitrary, but in this case any figure between 1.04 and 1.19 will yield the same results.

(b) Unsatisfactory cost history. An unsatisfactory cost history will be assumed if the ratio of the firm's postwar variable costs per 1.00 of sales to its prewar variable costs is greater than the median for all seven firms. Thus, we identify an unsatisfactory cost record with a disproportionate increase in variable costs.<sup>1</sup>

(particularly in line 12 of Schedule B), we have assumed the absolute figures to be right and have recomputed the percentages.

1. Overhead costs are, of course, of equal importance. In the particular case at hand no information was available on overhead costs. It is necessary, WWW.irpublicpolicy.ir

Clearly, in making such criteria invariant among the firms, we are assuming that all firms have approximately the same aspiration level with respect to profits and costs. Such an assumption is open to empirical investigation and refutation. On the surface, however, it appears reasonable in the light of the external comparison features of aspiration-setting phenomena discussed above,<sup>2</sup> to expect profit and cost goals to tend toward similarity within a single industry.

On the basis of these empirical criteria, we can make a prediction with respect to the sales expansion of different firms in this group. Such a prediction is indicated in Table III, in which the firms are

According to Profit and Cost Histories			
Firm	Profit history	Cost history	in sales expansion
Α	Satisfactory	Satisfactory	6
в	Satisfactory	Satisfactory	6
С	Unsatisfactory	Unsatisfactory	1
D	Unsatisfactory	Satisfactory	3
$\mathbf{E}$	Satisfactory	Satisfactory	6
$\mathbf{F}$	Satisfactory	Unsatisfactory	3
G	Satisfactory	Unsatisfactory	3

TABLE III

PREDICTED ORDERING OF FIRMS WITH RESPECT TO SALES EXPANSION

ranked according to the prediction. It will be noted that the prediction is, in fact, a trichotomy — as was manifest above.

The ratio of postwar to prewar shipments expresses the extent of sales expansion for the firms involved, and the seven firms can again be ranked according to this variable. The observed rankings of firms by this criterion are compared with the predicted rankings in Table IV. The rank correlation coefficient (tau) between the predicted and observed rankings is .73, significant at the .05 level.<sup>3</sup> Thus we can reject the null hypothesis that the observed ranking is independent of the predicted.

This result appears to suggest the empirical plausibility of the therefore, to assume that overhead costs are either about the same or that the overhead costs contain only those costs which are not "controllable." For a discussion of the concept of control, see T. Lang, W. B. McFarland and M. Schiff, Cost Accounting (New York, 1953), pp. 465–96.

2. See Section II.

3. See M. G. Kendall, Rank Correlation Methods (London, 1948). Since we have predicted a positive correlation, a one-tailed test of significance is appropriate. The probability of a positive correlation of .73 occurring if, in fact, there is no relationship, is approximately .025.

#### TABLE IV

		onning intrint	51011	
Fi	rm	Predicted rank	Observed rank	
(	2	1	1	
]	F	3	<b>2</b>	
]	D	3	3	
(	3	3	5	
]	3	6	4	
1	4	6	6	
]	E	6	7	

Predicted and Observed Ordering of Firms with Respect to Sales Expansion

considerations advanced here. We have been able to predict — with significant success — the relative sales expansion activities of seven firms in an oligopolistic industry. In particular, we have done considerably better in predicting than we would have done if we had simply predicted that smaller firms would increase proportionately more than large firms. The correlation between prewar sales and the postwarprewar ratio is negative (-.33) but not statistically significant.

Of course, no one would suggest that this one small study establishes the validity of the comments made. It does, however, lend credulity to the insistence that acceptable level goals, planning behavior, and organizational slack are features of organizational behavior that should be included in a general theory of firm behavior. There is every reason to believe that further empirical research will increase the precision with which such concepts can be used as predictive devices.

#### V. THEORETICAL RELEVANCE

One of the advantages of the profit maximization assumption, cited even by those economists who have a doubt as to the relevance of making the assumption, is that "... the assumption leads to definite, precise implications as to what a firm will or will not do given the cost and revenue data."<sup>4</sup> The further argument is that other assumptions do not lead to definite implications of firm behavior. Leaving aside the question of the value of definite theoretical results which may have little empirical relevance, it is possible to demonstrate that the principles described in this paper can be put in the form of a model which can also lead to definite results. In addition the model may be

4. A. G. Papandreau and J. T. Wheeler, Competition and Its Regulation (New York, 1954), pp. 73-74.

made to explain certain facts which the traditional model cannot satisfactorily explain.

For illustrative purposes the situation chosen for making a comparative analysis of approaches is that of the price leader<sup>5</sup> or, as it is also called, the dominant firm.<sup>6</sup> Stigler describes the case as one in which the dominant "... firm supplies a substantial part of total sales (probably one-fourth at a minimum). It has numerous small, independent rivals, but the situation can be viewed as one of duopoly because all of these firms behave competitively (i.e., they operate at



the output where marginal cost equals price). The dominant firm behaves passively — it fixes the price and allows the minor firms to sell all they wish at this price."<sup>7</sup>

5. See Chamberlin, op. cit., p. 50, note 1.

6. The case of the dominant firm is described in many textbooks. See, for example, G. J. Stigler, *The Theory of Price*, p. 227, and K. E. Boulding, *Economic Analysis* (Revised ed.), p. 585.

7. Stigler, loc. cit. As Bain points out in *Production and Distribution Theories*, pp. 185–86, there are ways other than price leadership of achieving concurrent price action. Bain suggests, for example, that price behavior in the automobile

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There are several aspects of the model which are of some interest. There is a definite implication in the model that there is no competitive selling activity between the minor firms and the dominant firm. There is an implicit assumption that the dominant firm sets a price that not only will allow the minor firms to sell some quantity of output but also will allow at least some of the minor firms to survive.

The geometric solution to the dominant firm case is as follows:

$S_M$	==	supply curve of minor firms
$S_D$	=	supply curve of dominant firm
D	==	market demand curve
$D_D$	=	dominant firm demand curve
$MR_D$	=	dominant firm marginal revenue curve

The solution is a price of OP, an output of  $q_M$  for the minor firms, and an output of  $q_D$  for the dominant firm  $(Oq_M + Oq_D = OQ)$ .

It is argued that behavior in the steel industry, as well as other industries, is explained by the price leadership model.<sup>8</sup> One of the interesting aspects of the steel industry, as well as a number of other dominant-firm price-leadership industries, is the fact that the market share of the dominant firm has shown a steady downward trend.<sup>9</sup> The dominant firm has grown but at a slower rate than the minor firms taken as a group. It is difficult to explain this development on the basis of the traditional model. One explanation sometimes given is that the dominant firm fears antitrust action and, therefore, voluntarily allows a reduction in its market share to take place. If this is the case it would be desirable to have a place for such a factor in the model. Another possible explanation is that the price set by the dominant firm allows the minor firms to make a profit which stimu-

industry is perhaps explained by a "loose concurrence" of price action achieved through "mutual respect." For an analysis of the price behavior of the major firms in the automobile industry see R. M. Cyert, "Oligopoly Price Behavior and the Business Cycle," *Journal of Political Economy*, LXIII (Feb. 1955), 41–52.

8. Boulding, op. cit., p. 585. Boulding, for example, states, "As we should expect, also, the industries characterized by 'price leadership' are those in which a simple, homogeneous commodity is produced by a small number of firms. The steel industry and the cement industry are excellent examples."

9. For the steel industry see, Business . . . Big and Small . . . Built America (New York, 1950), p. 67. The U. S. Steel percentage of the industry production of ingots and castings has declined from 65.72 per cent in 1901 to 33.14 per cent in 1949. A. R. Burns, *The Decline of Competition*, pp. 76-145 discusses the problem of price leadership. He lists agricultural implements and cans as other industries in which the dominant firm has had its share of the market reduced. On p. 172 Burns states, "It appears to be the common fate of leaders to suffer a decline in their proportion of the total business in the market."

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lates new entry. This explanation can probably be invalidated empirically for most dominant firm industries and certainly can for the steel industry. Other explanations can be adduced but they are either tortured or demonstrably invalid.

It is now of some interest to examine the model discussed in this paper to see what kind of solution to the price leadership case can be deduced and to see what kind of explanation to the dominant firm's loss of its share of the market can be offered. The same general assumptions will be made as in the model just described. There is, however, no assumption that the market demand curve is known with certainty. Rather, the starting point is the assumption that the dominant firm has a level of profits considered acceptable which it wishes to achieve. The factors which establish the level considered acceptable can be determined only by empirical research. Another factor that the firm must take into account during its planning is that the minor firms must be allowed some of the market at a price which will allow at least some of them to survive. A third possible factor, and one which affects the first two factors, is the degree of fear of antitrust action if "excessive" profits are earned or if minor firms are forced to leave the industry. A fourth and related factor is the fear of adverse public opinion if profits go too high. On the basis of these factors it is argued that there is a tendency for the dominant firm to be conservative in its demand expectations. As a result of this conservatism the dominant firm tends to underestimate the demand curve for the industry. In such a situation the minor firms are exposed to a demand which is greater than can be supplied. The net effect of this set of circumstances is to stimulate the minor firms to expand relatively more than the dominant firm.

One explanation has been offered by A. R. Burns. He states "The leader may even be more cautious than smaller rivals in calculating the future rate of expansion of demand upon which it bases its investment policy."<sup>1</sup> Some of the reasons for the greater caution of the dominant firm have been given above. There has been no attempt to verify the model empirically other than a rough test for general consistency with known facts. The important element highlighted by the model is the fact that "definite results" can be deduced from models in which profit maximization is not assumed. Further, such models, as in the present case, may be made to yield hypotheses that can explain observed phenomena which remain unexplained by traditional models.

1. Op. cit., p. 143.

The geometric solution then is as follows:



On the basis of the desired level of profits and the estimated demand curve (not drawn), the firm decides to produce  $Oq_D$  and sell at a price of OP. The actual decision criteria used in view of the probability distribution of demand and cost estimates is ignored because of the lack of empirical data on decision criteria. Such elements can be easily introduced into this framework, however. It should be noted in the above solution that  $Oq_M + Oq_D < OQ$ . (D is the actual demand curve.) As described above, there will be excess demand in the industry with a resulting expansion by the minor firms which is relatively greater than the expansion by the dominant firm.<sup>2</sup>

### VI. SUMMARY

A partial framework for the empirical study of the business firm has been described. As a substitute for assumptions characteristic of neoclassical theory, an attempt has been made to abstract and analyze the actual processes within the organization that lead to decisions.

2. It should be noted that the dominant firm model covers only one class of cases. The inference should not be made that the acceptable level of profits concept means that a large firm never expands. There are obvious contradictions to such a proposition; General Motors is perhaps the most outstanding contradiction. We are arguing rather that the firm uses a concept of acceptability in making many decisions. It is important to incorporate this concept into models of the firm and to understand how the concept changes and the effects such changes have on the firm.

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Of key importance to the functioning of the firm as described in this paper is the planning or budgeting process. It is within this process that the decisions of primary interest to economists are made. The approach taken here has been to explain the ways in which internal or organizational factors affect the planning process and the ways in which the nature of the planning process in turn affects the decision-making activities of the organization. For example, it has been argued that on several grounds there is adequate basis to justify the introduction of the concept of an acceptable-level profit norm in place of the traditional profit maximizing assumption. Further, it has been argued that the nature of the planning process introduces important regularities of behavior that are not adequately considered in other models.

Finally, since it seems important to take account of the manipulation of internal factors that characterizes firm behavior when plans are not met, the concept of organizational slack has been introduced as a feature of organizational behavior.

It is not maintained that all significant factors affecting the decision process have been discussed here. For example, the impact of the communication structure of the organization on the process of budgeting has not been considered since it was evaluated in a previous paper. The actual decision criteria used by the firm have not been explored in detail. The empirical study of the firm being still in its infancy, it would be unwise to claim that the present list of variables exhausts the important factors to be introduced into a general theory. It is hoped that empirical work currently in progress will shed additional light on significant factors for such a theory.

A further understanding of the approach taken in this paper can be achieved by a comparison with the approach taken in the neoclassical theory of the firm. The latter theory consists of a decision rule which is dependent on two functions — marginal revenue and marginal cost. No variable can affect the final solution unless it affects either marginal cost or marginal revenue or both.<sup>3</sup> The two functions thus become a kind of catalogue for an analysis. The factors that may affect either function can be deduced, as well as the direction of the effect. The general approach in this paper has been to

3. It is interesting to note that certain economists who have over time become identified with the neoclassical approach have in fact been interested in and have made use of certain aspects of behavior explained only by models which do not assume profit maximization. See Chamberlin, *op. cit.*, pp. 104-9, for Chamberlin's own work along this line as well as for references to a number of other well-known economists which are given there.

view the decision-making process as being affected by more variables than those introduced in classical theory. In particular, the analysis is extended to include considerations of the internal operations of the firm.

The explicit emphasis of the work partially represented by this study is on the construction of a theory that will permit the derivation of operational theorems, a function of theory that has been notably ill-performed by the theory of the firm. Reasons have been given for believing that the present approach has both theoretical and empirical implications, and in particular that it leads to testable predictions of organizational behavior.

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