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Cooperative Enterprise and Organization Theory

Peter Helmberger and Sidney Hoos

Introduction

Traditional microeconomic theory envisages three types of economic agents—consumers, firms (entrepreneurs), and resource holders. This classification, however, fails to accommodate numerous decision-making units, such as governments, political parties, and labor unions, that cannot be ignored in explaining and predicting economic phenomena. In agricultural economics, the cooperative association is such an institution. At first blush one might be inclined to view it as a firm of perhaps a special type. Several students of cooperation, however—particularly Ivan Emelianoff and Richard Phillips—have evolved a theory in which the cooperative association is not viewed as a firm.[1] Another student, in reply, has called for a "broader interpretation of the definition of a firm in accord with actualities" which would encompass a cooperative association as a firm and as a "going concern."[2]

The purpose of this paper is to show that organization theory provides a broader interpretation of the firm that is useful for empirical research on cooperative decision making. It will also be shown that by making certain assumptions within an organizational framework, the marginal analysis can be used in deriving hypotheses about cooperative performance in much the same way as it has been used in traditional theory.

The Present Controversy

We begin with a brief review of the present controversy over the economic nature of cooperative associations. The cooperative enterprise is usually held to be a non-profit institution guided by the principle of service at cost for the benefit of patrons. Thus the usual concept of the firm, modeled

after the business enterprise with a decision-making unit (entrepreneur) motivated by profit, does not jibe well with the nature of a truly cooperative association.[3]

Emelianoff regards a cooperative association as an aggregate of economic units each fully retaining its independence in seeking profits. Phillips accepts this view, arguing that a member firm should be treated as a multi-plant, vertically integrated firm. He writes, "the entrepreneurs of the associated firms each must allocate productive resources to their common plant, the same as a multi-plant firm must allocate resources to each of its plants."[4]

With this conception of the cooperative association, all of the attention is centered on the entrepreneurs of the member firms, and the problem which remains is one of specifying their optimum rules of behavior with profit maximization as the postulated norm. In spelling out profit-maximizing conditions for the cooperating firms, Phillips—by analogy—relies on the criteria deduced by Hirsch for a vertically integrated firm.[5] Criteria are set forth for cost minimization, optimum output, and optimum size of the cooperative plant.

It is unnecessary to critically appraise Phillips' theory here. This has already been done by others.[6] The basic objection to the theory can easily be seen by giving Hirsch's definition of a vertically integrated firm: "A vertically integrated firm is a single profit maximizing entity, in which a number of units, each performing different functions in the production and/or marketing of similar commodities on successive levels, are brought under a single managerial control."[7] It is apparent that Phillips' analogy between a cooperating firm and a vertically integrated firm as defined by Hirsch is untenable. The participating member of a cooperative association cannot in general be assumed to manage the cooperative plant and operations. Through membership, he commits himself to abide by group decisions. Strangely enough, this point has been sharply drawn by Robotka, one of the writers upon whom Phillips' work is presumably based.[8] In brief, the frame of reference espoused by Phillips does not reflect the emergence of a new decision-making unit upon the organization of a cooperative.

Organization in the Business Enterprise

Andreas Papandreou has outlined a frame of reference for the study of the firm based on earlier work in organization theory, notably the work of Chester Barnard and Herbert Simon.[9] Papandreou argues that an organizational approach will aid in the treatment of problems of conscious coordination of activities within the firm in contrast to the unconscious coordination of economic activity via the market mechanism. We propose adopting an organizational approach for the study of the cooperative association. In this way, the cooperative association may be thought of as a firm, with a resulting conceptual framework which has certain advantages over the one used by Phillips.

Central to the definition of the firm here adopted is the concept of *organization* which Chester Barnard defines as a "system of consciously coordinated activities of two or more persons."[10] In light of this concept, a firm may be defined as a cooperative[11] system which consists of organization,

persons who contribute activity to the organization, and privately owned physical plant; and in which (1) economic resources are mobilized, (2) goods and services are produced for sale, and (3) primary reliance is placed on the proceeds from the sale of the product to meet production costs. This definition of the firm is not pegged on the existence of an owner-manager type entrepreneur, nor does it insist that the firm be a profit-making entity. The key to the definition is the concept of organization which we shall now take up in greater detail.

Organization can emerge only when (1) persons contribute activity to the system, (2) participants share one or more common goals, and (3) communication among participants is present. Persons contribute activity through accepting certain roles which the organization imposes upon them as a requirement for membership. Persons will contribute activity, however, only if their own individual goals are furthered thereby. This implies that participants must be provided with inducements which, in the case of a firm, might take the form of wages, opportunities for promotion, emoluments, fringe benefits, and so forth.

Activity alone does not give rise to organization. It must be given a sense of direction, i.e., coordinated toward the achievement of certain ends. In order to understand the problems associated with conscious coordination, consider a firm which embodies a more or less complicated organization. The goals of the firm are normally formulated at the top level of the administrative hierarchy, but are actually implemented by the physical tasks performed by the operatives at the lowest administrative levels. To the executives at various levels or segments of the organization fall the tasks of planning and coordinating activities which will facilitate attainment of certain ends and impart to the total system a rational character.

Action takes place at all levels of the organizational hierarchy and to be purposive must be preceded by decision-making processes. Simon holds that every decision involves factual and value premises.[12] In a word, a value premise is related to a choice of ultimate goals whereas a presumed factual premise concerns the means for goal achievement and, in principle, can be tested to determine whether it is true or false. An organizational participant armed only with factual premises could link alternative actions with certain consequences, but his behavior would evince randomness aplenty were he unable to judge the desirability of those consequences. In order to rank possible consequences according to their desirability he *must* also incorporate value premises in choice selection. If organization is to exist, *the participants must adopt those decisional premises in choosing among alternative courses of action which will give rise to consciously coordinated activity.* One cannot suppose that the matter of supplying organizational participants with the relevant factual and value premises is merely one of chance. Indeed, a central problem in organization theory relates to an explanation of how this is to be brought about. We cannot here pursue at great length the organization theorist's line of reasoning, but there are two further facets of his model which warrant our perusal. These are the concepts of authority and communication.[13]

An individual may be said to be subject to authority if "he sets himself a general rule which permits the communicated decision of another to

guide his own choices (i.e., to serve as a premise of those choices) without deliberation on his part on the expediency of those premises."[14] Authority is essentially the power to guide and control (within limits, however) the actions of another. Following Papandreou, we may assume the existence of a "peak coordinator" consisting of a person or group of persons that, for one reason or another, wields effective authority over all organizational participants in the firm.[15] The peak coordinator is not to be associated necessarily with a board of directors, the chief executive, the manager, and so forth, but rather to the person or group of persons that specifies the ends of the firm and engages in action to secure their attainment.

It is through communications that the decisional premises are transmitted from one member of an organization to another. Authoritative communications involving to a large extent the value premises implicit in the organizational goals can be expected to flow downward for the most part. Communications involving primarily factual premises may flow in all directions. In this connection, it is crucial to note that the organization theorist rejects the notion of "economic man" with his profound knowledge in favor of "administrative man" who must contend with limited information and computational ability. It behooves the administrative hierarchy, then, to (1) gather data and information needed for expertise in decision-making, (2) carry out programs of training and orientation, and (3) transmit information from various sources to the decision centers where it is needed.

By way of summary, the concept of the firm here adopted comprehends a cooperative system consisting of physical plant, persons, and organization. To set the firm off from other cooperative systems, a municipal government for example, it is also necessary to assign ownership of the physical plant to private agents and to note the economic functions which the cooperative system performs. The peak coordinator is assigned a central role and performs certain functions ordinarily attributed to the entrepreneur. Although the peak coordinator is in a position of authority, determines the ends of the firm, and undertakes action to secure their attainment, he may be completely dissociated with ownership of the firm and bear none of the corresponding risks. Notice further that no commitment has been made as regards the ends of the system. If one wishes to adopt a conception of the firm sufficiently broad so as to accommodate the cooperative enterprise, then clearly the assumption of profit maximization must be considered a special case.[16]

The Cooperative as a Firm

It should be clear that the cooperative enterprise can legitimately be viewed a firm as here defined. It embodies persons and privately owned physical plant. It mobilizes factors of production, produces goods and services, and relies primarily on the proceeds from the sale of its product to meet the costs which it incurs, much as would any business enterprise. Yet, its economic character differs from that of the usual type of enterprise in numerous respects. It is in the organizational anatomy and physiology of the cooperative enterprise that its distinctive behavior and performance can, in large part, be explained.

Perhaps a basic difference between the two types of enterprise under consideration stems from the motivations of persons who undertake their creation. Investors in the usual type of business enterprise seek a high return on their investments. When agricultural producers jointly undertake the creation of a cooperative association, they seek goods and services provided at cost. The difference between the intended objectives of the two types of enterprise explains in large part certain organizational arrangements and mechanisms peculiar to each. Uniform treatment to investors in the profit-seeking enterprise, for example, may be much simpler to accomplish than uniform treatment to the member patrons of a cooperative. Because of the existence of cooperative policies which might discriminate in some systematic fashion among members, there is a corresponding need for the election of a "representative" board so that conflicting interests may be compromised. The apparent differences between cooperative and profit seeking enterprises should not, however, cloud the main issue. In both cases, the allocation of economic resources comes under the direction of a "single" authority.

The concept of the cooperative enterprise in light of organization theory points toward the need for a more detailed knowledge of the actual decision-making processes within cooperative organizations. In particular, the following closely related problem areas are set forth as being worthy of further study and investigation:

1. Whether or not, and if so to what extent, cooperative enterprises are management controlled. Management might gain control through contrivance or, more likely, through default on the part of the directors. It is surprising in view of the voluminous research on cooperation that little has been done to ascertain who exercises effective control in the cooperative enterprise. There appears to be no work in the literature on cooperation comparable, for example, to Robert Gordon's *Business Leadership in the Large Corporation.*[17] Studies of organization charts, bylaws, and the general attitudes of directors and employees are no substitute for the numerous intensive case studies which are needed to resolve the issues involved.[18]

2. The goals of the cooperative enterprise. The issue here is not whether all of the goals are diametrically opposed to or in full accord with the interests of member firms. The point is that certain goals in certain situations could be inimical to the interests of members. Are cooperative enterprises motivated by survival, for example, with an ensuing tendency to persist in some cases long after their usefulness to members has passed away? There are, of course, other goals such as management prestige, cooperative growth, gains in the form of management salaries, or even the "Hicksian quiet life," which could lead to cooperative policies undesirable from the viewpoint of members.

3. The extent to which the cooperative enterprise commands the actual information needed for expertise in decision making. If the cooperative policies are to further the ends of the member firms, "correct" cooperative goals are not enough. The road to bankruptcy and failure might easily be strewn with the wreckage of cooperative enterprises which had the very best intentions.

4. The consequences of the nature of the cooperative enterprise's internal organization for its performance in dimensions such as technical efficiency, the level of returns to members, selling expenditures, growth, and progressiveness in terms of the development and adoption of new technologies. In this connection a study of the performance of the cooperative enterprise relative to that of the firm prowling about in search of profit would appear both interesting and informative (as well as controversial!). Such a study could be expected to provide new insights into the viability of cooperative enterprises and their effectiveness in influencing competition in agricultural markets.

Theory of the Firm Adapted to the Cooperative

As suggested above, an organizational framework focuses attention on the problems associated with the conscious coordination of activity within the cooperative enterprise. There is also the issue of the implications of cooperative marketing for the performance of the market mechanism. This raises an important question. Having argued that the cooperative enterprise can legitimately be viewed a firm, one might well ask whether or not theory of the firm can be adapted to reflect its peculiar economic nature. In this section we show that by assuming maximizing behavior on the part of the cooperative enterprise, behavioral relations and positions of equilibrium can be derived through traditional marginal analysis. This, in turn, lays the foundation for the more comprehensive task of adapting theory of the firm, in its entirety, to the cooperative enterprise.

A Short-Run Model

We make the following initial assumptions. Numerous firms are bound through contractual arrangements to market their entire production of some commodity, M, through the facilities of their non-profit cooperative enterprise. Each member firm is a profit maximizer, has a fixed plant, and the functions relating the average and marginal costs to output have the usual U-shapes. Further, the possible output variations of any member firm are sufficiently small to have negligible impact on the costs and/or revenues of the cooperative enterprise.

Turning to the cooperative, various productive services are combined along with M, the raw material, in the production of a finished commodity, Y, according to the production function $Y = Y(X_1, X_2, \ldots, X_n, M|Z)$, where X_i represents the ith productive service and Z a fixed plant. It is assumed that (1) the production function is a single-valued function which specifies all of the technologically efficient methods of production; (2) the marginal physical productivities are non-negative in the relevant region; and (3) the isoquants are smooth, and convex to the origin.[19] For simplicity, we suppose that all $X_i(i = 1 \ldots, n)$ are purchased and Y is sold in perfectly competitive markets. Thus, $P_i = \overline{P}_i(i = 1, \ldots, n)$, and $P_y = \overline{P}_y$ where P_i is the price of the ith productive service and P_y is the price of Y. We assume that the goal of the cooperative organization is to maximize the price of the raw material, P_m, for any amount of M which the member firms choose to supply, but subject to the constraint that all costs, including fixed costs,

F, are met. The cooperative membership is fixed, and the cooperative stands willing to market all that members wish to supply. Member firms are to receive uniform treatment (service at cost), which is assumed to be consistent with returning the same net return per unit of M, P_m, to each member firm. With regard to the constraint that fixed costs must be covered, it is clear that a cooperative enterprise facing competition in the procurement of M might be forced to "consume" the fixed plant and eventually pass out of existence. Numerous difficulties inherent in such a possibility are abstracted away by supposing that the cooperative enterprise can return to members a sufficiently high price to assure their continued participation even though revenue is set aside in order to replace fixed plant.[20] Certain implications of the relaxation of this assumption will be noted later. If the cooperative were a profit maximizing economic agent, its profit function, where π equals profit, could be written as follows:

$$\pi = \bar{P}_y Y - \sum_{i=1}^{n} \bar{P}_i X_i - P_m M - F \tag{1}$$

But $\pi = 0$ by assumption, and we may inquire as to the cooperative performance for a given level of M, $\bar{M}$, noting that the cooperative enterprise in this model views M as a parameter beyond its control. Equation (1) may be rewritten as:

$$S = \bar{P}_y Y - \sum_{i=1}^{n} \bar{P}_i X_i - F \tag{2}$$

where S may be viewed as the cooperative surplus and is given by the expression $S = P_m\bar{M}$. Clearly, a maximum S will determine a maximum P_m. The maximization of S implies the fulfillment of a cost minimization condition and an optimum output condition. As might be expected, these conditions are exactly analogous to those which must be realized if a profit-seeking, purely competitive firm is maximizing profit. It may be worthwhile to show that this is true.

Although the amount of raw material is fixed, various alternative levels of Y might be feasible.[21] In order that S be a maximum, any level of Y produced, $\bar{Y}$, must be produced at a minimum total variable cost, where total variable cost, represented by C, is defined by the equation

$$C = \sum_{i=1}^{n} \bar{P}_i X_i \tag{3}$$

Then we may write

$$C = \sum_{i=1}^{n} \bar{P}_i X_i - \lambda[Y(X_1 X_2, \ldots, X_n | \bar{M}, Z) - \bar{Y}] \tag{4}$$

where λ is the Lagrangean multiplier. If C is to be a minimum, the following conditions must be satisfied:

$$\frac{\partial C}{\partial X_i} = 0; \qquad \bar{P}_i = \lambda \frac{\partial Y}{\partial X_i} \qquad (i = 1, \ldots, n) \tag{5}$$

Cost minimization for any given level of Y implies that the cost-productivity ratio for any one productive service, i.e., the ratio of its price to its marginal physical productivity, must equal the cost-productivity ratio of any other

productive service. For each Y, there will be a corresponding minimum variable cost of production according to the function

$$C = C(Y) \tag{6}$$

where C = total variable cost.

Equation (2) may now be written as follows:

$$S = \bar{P}_y Y - C(Y) - F \tag{7}$$

If S is to be a maximum, the following conditions must obtain:

$$\frac{dS}{dY} = 0; \qquad \bar{P}_y = \frac{dC}{dY} \tag{8}$$

A maximum S implies that price is equated to marginal cost. In order to rule out the possibility of a minimum, it is also assumed that the marginal cost function is positively sloped at the point of intersection with the average revenue function.[22]

Let Y_0 represent the output associated with the maximum S, and ATC_0 the corresponding average total cost of production. At the maximum, then, $S = (\bar{P}y - ATC_0)Y_0$ and since $S = P_m\bar{M}$,

$$P_{m0} = \frac{(\bar{P}_y - ATC_0)\ Y_0}{\bar{M}} \tag{9}$$

For any given level of M, the cooperative will choose to produce the level of Y that maximizes P_m. Hence, there exists a unique functional relationship between the maximum price of M, P_{md}, and the level of M;

$$P_{md} = (P_{md}M) \tag{10}$$

We will call this relationship the short-run net returns function. It shows the maximum price the cooperative enterprise can return to members, after covering fixed and variable costs, for the various levels of raw material which they might choose to supply. The shape and position of the short-run net returns function depend solely on the character of the production function, given the prices of the productive services, fixed costs, and the price of the cooperative output.[23]

In order to show how a particular M is determined, we shift our attention at this juncture to the member firms. Each member, according to our assumption, is free to produce whatever amount he chooses. In making his decision as to how much to produce, each member views the net returns per unit from the cooperative as invariant with respect to his output variations and is, therefore, a price taker. This allows setting up an aggregate supply function for the member firms:

$$P_{ms} = P_{ms}(M) \tag{11}$$

Where P_{ms} equals the price received by members.

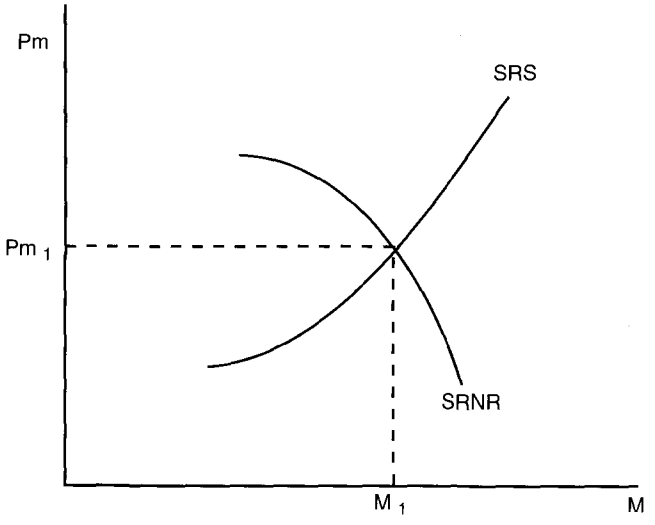
Equations (10) and (11) are depicted graphically in Figure 1, where *SRNR* and *SRS* denote the short-run net returns function and the short-run supply function, respectively. The point (P_{m1},M_1) determines an equilibrium position for the cooperative enterprise *and* the member firms. Any $M<M_{m1}$ will allow a $P_m>P_{m1}$ which would call forth an increase in the amount supplied to the cooperative. Any $M>M_1$ will result in a $P_m<P_{m1}$, which would give rise to a contraction in the amount supplied. At $M = M_1$, the cooperative will be maximizing P_m, subject to the necessary constraints, and each member will be equating his marginal cost to the price received.[24]

Notice that our results do not depend on the particular shapes of functions (10) and (11) depicted graphically in Figure 1. The net returns function can take any of a variety of shapes, for example, and still allow an equilibrium position to be reached. If it is positively sloped, however, it must cut the supply function from above (moving out along the M axis *from* the origin) if the equilibrium is to be a stable one. It is interesting to note that if the net returns function is positively sloped in the relevant region, the cooperative enterprise increases its return to members by accepting non-member patronage, even if it pays non-member patrons the same return paid to members. In general, it appears that the shape of the net returns function has definite implications for cooperative policy. This will become even more clear in the long-run models which are now taken up.

Two Long-Run Formulations

Passing from a short-run to a long-run situation involves specification of different assumptions. Turning first to the cooperative enterprise, the

Figure 1



assumption that it has a fixed plant is dropped and instead we assume that all productive services are freely variable in the production of Y. With regard to cooperative goals, two formulations are proposed. First, it is assumed that the cooperative enterprise maximizes P_m, subject to the constraint that the costs of producing Y (excluding payments to members) are met. The relevant function to be maximized in this case becomes

$$P_m = \frac{1}{M}\left(\bar{P}_Y - \sum_{i=1}^{k} \bar{P}_i X_i\right) \tag{12}$$

where we are assuming given prices for the productive services and cooperative output and the production function $Y = Y(X_1, \ldots X_k, M)$. Notice, however, that maximization of P_m involves determining a certain value for M as well as the value for $X_i (i = 1, \ldots, k)$. In other words, in order to maximize P_m the cooperative enterprise must determine the amount of M which it utilizes in producing Y. The level of M may be determined through pursuing a policy of restricted membership. If P_m is to be a maximum, the cooperative enterprise must select the number of member firms such that when each member is in equilibrium (long-run) they will in total supply a certain amount of M which allows attaining the maximum P_m. How this can be accomplished will be taken up momentarily.

In the second formulation it is assumed that the cooperative maximizes P_m, subject to the constraint that the costs of producing Y (excluding payments to members) are met, for any M which a freely variable number of members wish to supply. The cooperative enterprise with this type of goal may be called an open-membership (in contrast to a restricted-membership) type cooperative. The function to be maximized becomes

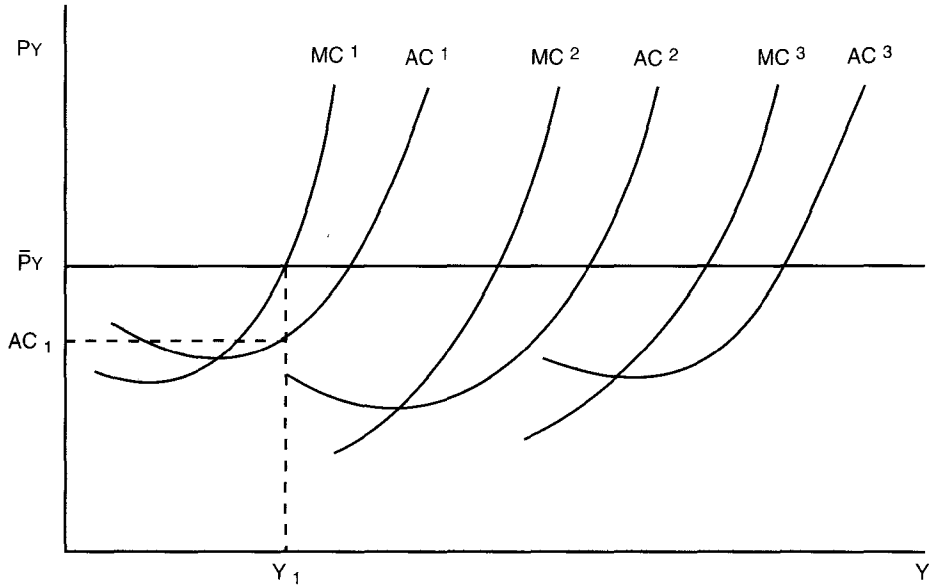
$$L = \bar{P}_y Y - \sum_{i=1}^{k} \bar{P}_i X_i \tag{13}$$

where $L = P_m \bar{M}$. The essential difference between equation (12) and equation (13) is that M is a variable whose value is to be determined by the cooperative in the first case and whose value is viewed by the cooperative as a given in the latter case.

Regardless of which long-run formulation we want to pursue, it is convenient to begin by deriving a long-run net returns function. Again we may consider the necessary conditions for a maximum P_m, *given a level of* M. The maximization problem is essentially the same as in the short-run model in that although there are no fixed costs, the level of M is given. A maximum P_m implies that any level of Y produced must be produced at minimum cost and that a particular level of Y will be produced such that the marginal cost of production equals the price of Y.

For purposes of geometric illustration, assume that graphs of the average and marginal cost functions have the typical U-shapes.[25] One can then imagine a whole family of short-run average cost curves, each associated with a different level of M but with all other inputs freely variable. Let us consider three such curves as depicted in Figure 2, where AC^1, AC^2, *and* AC^3 are associated with the three alternative levels of raw material, M_1, M_2, *and* M_3, respectively. For each level of M, the associated marginal

Figure 2

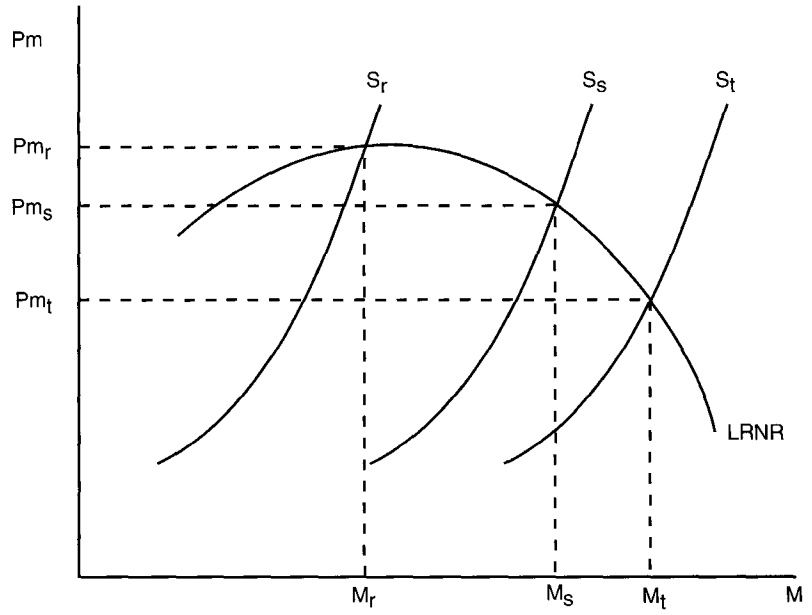


cost curve is equated with $\bar{P}_y$ and the determination of the corresponding maximum P_m is straightforward. If $M = M_1$, for example, $P_{m1} = (\bar{P}_y - AC_1)\, Y_1/M_1$. A long-run net returns function exists, then, since each level of M can be associated with a corresponding maximum P_m. The shape of this function will concern us at a later point.

Turning to the member (and potential member) firms, it is assumed that each is free to vary all productive services in the production of M. Each member has a set of U-shaped long-run average cost and marginal cost curves. It is further assumed that net diseconomies in the member firm result at a sufficiently low volume, relative to the output where substantial net diseconomies occur in the cooperative enterprise, so that member firms behave as price takers in deciding how much to produce. It is further assumed that no net external economies or diseconomies exist. The member firm's long-run supply curve may be defined for our purposes as that portion of its long-run marginal cost curve which lies above the long-run average cost curve. For a given number of members, a long-run aggregate supply curve is derived by summing horizontally the individual supply curves.

Let us arbitrarily choose a given number of member firms to start with and graph the resulting aggregate supply curve, S_s, along with the longrun net returns function, *LRNR*, in Figure 3. It is convenient for subsequent argument to assume an inverted U-shaped long-run net returns function. A justification for this assumption could be given following the reasoning behind a U-shaped economies of scale curve. Economies of specialization

Figure 3



operate to lower long-run costs, but are eventually swamped by diseconomies associated with management difficulties of one sort or another.[26]

At this point we must reintroduce our distinction between restricted-membership and open-membership type cooperatives, considering the former first. Clearly, if $M>M_r$, then P_m could be enhanced if the long-run supply curve were shifted to the left until it intersects *LRNR* at its maximum. A restricted-membership type cooperative should therefore limit membership so that the aggregate supply curve is at S_r. At the point of intersection of S_r and *LRNR*, an equilibrium exists. The cooperative goal is attained in that P_{mr} is the maximum P_m consistent with the given or assumed conditions. Each member firm is in long-run equilibrium, equating long-run marginal cost to the price received.

An open-membership type cooperative, however, will not impose a restriction on membership in order to return to members a price equal to P_{mr}. Any firm producing M may join the cooperative. It is possible, then, that starting with the given number of member firms, other firms may join the cooperative—thereby shifting the aggregate supply curve to the right. This being the case, P_m will fall as membership increases until presumably a P_m is reached, P_{mt} in Figure 3, which effectively forestalls further entry. Under certain circumstances, then, an open-membership type cooperative will in fact pursue a policy which is inimical to the interests of existing members but beneficial to potential members.

Whether a cooperative enterprise pursues a policy of open or restricted membership might depend on the effectiveness of existing members in electing a board of directors who will insist on one cooperative policy or the other. If a cooperative is management controlled, however, cooperative growth as measured by the amount of raw material handled, the number of members, or gross sales might well be one of the effective goals.[27]

Where the long-run net returns function is positively sloped, both the restricted- and open-membership type cooperatives would happily accept new members. In addition, the patronage of non-members, perhaps restricted in order to satisfy certain legal requirements, would also be accepted.

In the preceding formulations, traditional marginal analysis has been brought to bear on the cooperative enterprise. Equilibrium conditions for the cooperative and its member firms were derived under alternative sets of assumptions. The net returns function and the supply function were key concepts used in the derivation, the first reflecting cooperative maximizing behavior and the second the maximizing behavior of member firms.

There are many directions in which the analysis could be revised and/or extended. One might trace out how equilibrium positions vary with changes in the basic data. Also, other cooperative goals can be postulated. Attention was centered on the marketing cooperative; other types of cooperative organizations could be given similar treatment. Problems of intra-organizational conflicts which arise in the case of various types of pooling, multiple product operations, and multi-plant cooperatives have been abstracted away, but the analysis may be extended to include such influences. Extending traditional price theory to reflect the peculiar economic nature of cooperative enterprise will necessitate analysis of cooperative marketing in many alternative structural settings. Such appears necessary for an understanding of the welfare implications of cooperative marketing. These appear to be some of the major avenues for further theoretical work.

A Postscript

This paper was written with the belief that recent efforts toward the development of a theory of cooperation have been on the wrong track. In particular, it is suggested that Emelianoff 's morphology, which has led several writers astray, should be abandoned in favor of recognizing a cooperative enterprise as a decision-making entity. Once this is done, attention is immediately focused on a cooperative enterprise as an economic agent whose behavior and performance are appropriate subjects for theory and research.

Organization theory provides us with a concept of a firm which comprehends the cooperative enterprise as a special type. It provides a guide, as it were, for the research worker interested in the actual behavior of the cooperative enterprise or, more accurately, in the actual behavior of its organizational participants. The transition from a theory of the firm to a theory of cooperation within an organizational framework appears to be both straightforward and fruitful in terms of developing empirically mean-

ingful hypotheses with regard to the economic implications of cooperative marketing.

Notes

1. Ivan V. Emelianoff, *Economic Theory of Cooperation* (Washington: Ivan V. Emelianoff, 1942); and Richard Phillips, "Economic Nature of the Cooperative Association," *J. Farm Econ.*, 35:74–87 (Feb. 1953).

2. Job K. Savage, "Comment on 'Economic Nature of the Cooperative Association'," *J. Farm Econ.*, 36:531–32 (Aug. 1954).

3. Frank Robotka, in "A Theory of Cooperation," *J. Farm Econ.*, 29:94–114 (Feb. 1947) has catalogued numerous differences between cooperative and noncooperative types of business enterprise.

4. Phillips, *op. cit.*, p. 75.

5. Werner Zvi Hirsch, "The Economics of Integration in Agricultural Marketing" (unpub. Ph.D. diss., Dept. of Agr. Econ., Univ. of Calif., 1947), pp. 97–143.

6. See Savage, *op. cit.*, pp. 529–34; Oddvar Aresvik, "Comments on 'Economic Nature of the Cooperative Association'," *J. Farm Econ.*, 37:140–44 (Feb. 1955); and Raphael Trifon, "The Economics of Cooperative Ventures—Further Comments," *J. Farm Econ.*, 43:215–35 (May 1961).

7. Hirsch, *op. cit.*, p. 36.

8. Robotka, *op. cit.*, p. 103.

9. Andreas G. Papandreou, "Some Basic Problems in the Theory of the Firm," *A Survey of Contemporary Economics*, Vol. II, ed. by Bernard F. Haley (Homewood: Richard D. Irwin, Inc., 1952), pp. 183–219; Chester Barnard, *The Functions of the Executive* (Cambridge: Harvard Univ. Press, 1938); and Herbert A. Simon, *Administrative Behavior* (2nd ed.; New York: Macmillan, 1959).

10. Barnard, *op. cit.*, p. 73.

11. The word cooperative is here used in its broad sense.

12. Simon, *op. cit.*, pp. 45–60.

13. The importance of authority and communication in organization has been well described by Harvey Leibenstein, *Economic Theory and Organizational Analysis* (New York: Harper and Brothers, 1960), pp. 156–67.

14. Simon, *op. cit.*, p. 125.

15. Papandreou, *op. cit.*, pp. 190–91.

16. In point of fact, the assumption of maximizing behavior may be considered a special case. Neither Barnard nor Simon specify or require maximization necessarily; Simon, in fact, rejects maximizing in favor of "satisficing." Simon, *op. cit.*, pp. xxiv-xxvii.

17. Robert A. Gordon, *Business Leadership in the Large Corporation* (Washington: The Brookings Institution, 1945). See particularly pp. 317–51.

18. A modest but worthy first step has been made by William S. Folkman, *Boards of Directors of Farmers' Cooperatives as Decision Makers*, Ark. Agr. Expt. Sta. Bul. 614 (Fayetteville, 1959).

19. In order to rule out a seemingly very special case in which price lines are not tangent to isoquants but intersect the isoquants on an axis, we also assume that at least a small amount of every productive service is physically necessary to produce any positive amount of *Y*.

20. Obviously we are considering a highly simplified model in which attention is centered on a single cooperative enterprise isolated from competition in the procurement of *M*. This appears to be a useful first step in constructing more complex and realistic models which take explicit account of seller and buyer concentration, entry conditions, product differentiation, and other dimensions of market structure.

21. In the case of a fruit packing plant, for example, a larger output of packed fruit could, within a certain range, be associated with a more careful handling of a given amount of raw product.

22. We are implicitly assuming a production function such that after some unique level of output is reached, equal increments of expenditure on the productive services (given their prices and assuming least cost production) lead to diminishing increments in output. See George J. Stigler, *The Theory of Price* (Revised ed.; New York: Macmillan, 1952), p. 128.

23. The short-run net returns function derived above is only valid for a restricted range of prices. A more general short-run model would involve a net returns function applicable to a wider range of prices including prices which would not allow the cooperative enterprise to fully cover fixed costs.

24. Our results appear to be consistent with the conclusion reached by Aresvik, *op. cit.*, p. 141, who writes, "a participating firm in a marketing cooperative association equates the sum of the marginal cost in its individual plant or plants, plus the average cost in the joint plant with the average revenue facing the joint plant in the market where the product is sold." The proposition as it stands is consistent with equation (b) below if all costs and revenue are per unit of raw product. Suppose $M = M_0$. The ith member firm views the ratio Y_0/M_0, as a constant, α, and invariant with respect to his output variations. In order to maximize profit, he will view P_{m0} as given. The equilibrium condition for the ith firm, which might be transitory, may be written:

(a) $$MC^i = P_{m0} = P_{y0}—ATC_0)\alpha$$

where MC^i is the ith firm's MC in producing M. Therefore,

(b) $$MC^i + \alpha ATC_0 = \alpha P_{y0}$$

25. This assumption could be relaxed in favor of more fundamental assumptions concerning the properties of the production function. For a rigorous derivation of U-shaped cost curves, see Sune Carlson, *A Study on the Pure Theory of Production* (New York: Kelly and Millman, Inc., 1956), pp. 10–52.

26. For a somewhat dogmatic argument favoring this type of assumption, see Edward H. Chamberlin, "Proportionality, Divisibility, and Economies of Scale," *Quar. J. Econ.*, Feb. 1948, pp. 229–62. Then see Harvey Leibenstein, *op. cit.*, pp. 230–33.

27. See, for example, William J. Baumol, "On the Theory of Oligopoly," *Economica*, New Ser., Vol. XXV, No. 99 (Aug. 1958), pp. 187–98 and Leibenstein, *op. cit.*, pp. 278–81.