REPRINTED FROM

Acta Agriculturæ Scandinavica

VI: 4

ON THE ECONOMIC NATURE OF COOPERATION

By

PAAVO KAARLEHTO

STOCKHOLM 1956

ACTA AGRICULTURÆ SCANDINAVICA,

a periodical devoted to the publication of original research in agriculture, is published by the Scandinavian Agricultural Research Workers' Association (Nordiska Jordbruksforskares Förening) and the Royal Swedish Academy of Agriculture and Forestry (Kungl. Skogs- och Lantbruksakademien). Acta Agriculturæ Scandinavica is a sequel to Acta Agriculturæ Suecana, founded by the Academy in 1945.

The Scandinavian Agricultural Research Workers' Association is composed of members in Denmark, Finland, Iceland, Norway and Sweden. Chairmen of the departments for the different countries are: Professor S. Tovborg Jensen (Denmark), Professor Otto Valle (Finland), Mr. Árni G. Eylands (Iceland), Director Dr. Lars S. Spildo (Norway), and Professor I. Johansson (Sweden).

The editor of Acta Agriculturæ Scandinavica is Professor R. Torssell, secretary of the Royal Swedish Academy of Agriculture and Forestry, also general secretary of the Scandinavian Agricultural Research Workers' Association.

All contributions are written in English, French or German, illustrated when necessary with adequate text figures and plates. Each volume contains about 400 pages, issued in three or four numbers.

Subscriptions should be sent to the Editor, postal address Hovslagargatan 2^{III}, Stockholm C. Price: Twenty Swedish Kronor per volume. Postage free.

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UPPSALA 1956
ALMQVIST & WIKSELLS BOKTRYCKERI AB

Preface

Perhaps no other economic problems of equal scope and importance have been neglected in scientific economic research to the same extent as those involved in the cooperative type of economic activity. The literature on cooperation, even if abundant both in Europe and America, lacks clear and precise analysis. Only in a few instances, especially during the past few years, have serious attempts been made to approach this complex of problems by means of theoretical economics. These works have, however, been adequate to lay some of the corner-stones for building up a concept of the economic structure of cooperation.

At the same time as teachers, public relations men and managers of cooperative firms have been necessitated to repeat traditional doctrines in spite of the evident inconsistency between available theories and actual practice, trained economists have paid little attention to cooperation, regarding it mostly as a form of enterprise peculiar only in some technical considerations. Consequently, the students of cooperation even at the university level have been taught "the principles" with little if any criticism. It has not been solved which of these principles are decisive economically and which are meaningless or even contradictory to economic forces, perhaps relating only to ethical and social considerations.

The striking need of a pure economic theory of cooperation has led the author to an examination, in this book, of what are believed to be the economic essentials of cooperation. In spite of the shortcomings of this study, the author hopes thus to contribute to the development of a consistent and reasonably realistic theory.

The present work has been carried out at the Institution of Agricultural Policy, University of Helsinki, and at the Research Institute of Agricultural Economics, Helsinki, and completed at Pellervo-Seura, Helsinki.

It is my wish to acknowledge the deep gratitude I owe to my esteemed teacher Dr. K. U. Pihkala, Professor of Agricultural Policy and Marketing, who acquainted himself with my work already at an early stage and has always readily offered his experience and guidance in the course of the time I have been developing my theme.

I have particular reason to be grateful to Dr. Nils Westermarck, Professor of Agricultural Economics, for the counsel and encouragement that

he has proffered me. I also beg to extend my warmest thanks to Dr. LAURI O. AF HEURLIN, Professor of Economics, Dr. SAMULI SUOMELA, Head of the Research Institute of Agricultural Economics, and Dr. EINO HAIKALA, Head of the Research Section in the Central Bank of Cooperative Credit Societies, for their valuable suggestions.

For linguistic revision and partial translation of the manuscript my thanks are due to my friend, Mr. CHESTER SMITH, Syracuse, New York, U.S.A., and to Miss ELVI KAUKOKALLIO.

The work has been supported by grants from Pellervo-Seura and Kyösti Haatajan rahasto.

Finally I wish to express my thanks to the Scandinavian Agricultural Research Workers' Association and to the Royal Swedish Academy of Agriculture for including this study in the series of *Acta Agriculturæ Scandinavica.*

Helsinki, october 1956.

PAAVO KAARLEHTO.

On the Economic Nature of Cooperation

By Paavo Kaarlehto

Contents

associations of independent economic units striving for promotion of the activities of the members. Although LIEFMANN (1921, p. 142) realises the non-independence of cooperatives—"Im Gegensatz zu den Gesellschaftsunternehmungen sind sie nicht Vereinigungen mit selbständiger Erwerbstätigkeit, sondern sie wollen die private Wirtschaftstätigkeit ihrer Mitglieder nur fördern und ergänzen"— he does not, however, describe their activities quite adequately in a positive sense but mentions only "dass sie einer anderen Sphäre als dem privaten Ertragsstreben angehören".

In America the interest of the economists has been during the last few years concentrated more on theoretical studies of cooperation than earlier. Among the investigators within the field should be mentioned IVAN EMELIANOFF, FRANK ROBOTKA, EUGENE CLARK and RICHARD PHILLIPS.

The study of EMELIANOFF (1948) is presented as a reply to the question posed by the late President of the American Institute of Cooperation, RICHARD PATTEE, 17 years earlier in 1925 in the first annual session of this institute (ref. EMELIANOFF 1948, p. 1): "I wanted to find out just what we have got to do to be entitled to be considered cooperative.... I am wondering if thought along this line has gone far enough to enable us to set up a definition that is fixed and standard and can be applied with exactness...."

In his well-defined and logical theoretical analysis EMELIANOFF points out that a cooperative cannot be an enterprise but an aggregate of economic units. He also corrects many of the general misconceptions caused by erraneous traditional interpretations of the nature of cooperation. The greatest merit of EMELIANOFF's work is perhaps the scientific definition of certain essential concepts of cooperation. Although this must be regarded as a remarkable contribution to the study, there still remains much to be done in the field. First of all, economic relations between member units and the cooperative should be clarified by defining them in terms generally used in economics.

In his interpretation of the nature of cooperation ROBOTKA (1947) points out that a new economic entity has emerged when the cooperative is formed. Each participant must surrender his sovereignty to a certain extent in favor of the decision-making unit of the new economic entity. However, this unit cannot make decisions which are unrelated or inimical to the interest of the participants as producers. The joint decisions with respect to the business activity of the cooperative will be integrated with the members' decisions as individual producers. ROBOTKA's analysis of the nature of capital, dividend, control and some

to give adequate definitions for the cooperative association are to be found in these studies. Some critical attention has also been paid to such features in the field of cooperative activity as the problems of control and membership restriction, which are interesting from both the juridical and the economic aspect. And yet, their idea of the nature of the cooperative associations as an aggregate of persons—or an opposite of the capitalistic enterprise—finds reflection in the traditional school rather than in present-day scientific thinking. Besides, no existing law with all its restrictive provisions should be allowed to lay definite boundaries to the ideas of a theoretical economist, and thus the numerous juridical studies published both in Europe and America require no further attention in the present study.

The most voluminous part of the literature dealing with cooperation is of a descriptive nature. These works are mainly concerned with the economic development, from a historical standpoint, of specific cooperatives or of a particular branch of cooperation. Many a research worker has also attained valuable results by devoting himself to studies of business efficiency based on account statements. Typical for this descriptive group of literature is, generally speaking, the pure interpretation of empirical results, use of external characteristics of cooperatives and lack of analytical treatment. However, it is evident, as EMELIANOFF (1948, p. 13) has remarked, that "there is not a single structural or functional characteristic of cooperative organization treated usually in the descriptive literature which is common to all cooperative forms. Even those features which are universally recognized by the students and by the laws as the specific characteristics of cooperatives are widely and irregularly varying and in many cases are replaced by the diametrically opposite traits."

Among German economists particularly, ROBERT LIEFMANN and HANS FUCHS have paid attention to interpretation of the economic nature of cooperatives. Although FUCHS (1928) in his theoretical study refers only to productive cooperative associations, his treatment leads to certain conclusions which could be generalized to cover cooperation as s whole. He stresses especially the significance of the membership questions pointing to the fact that it is impossible to follow the principle of open membership without restrictions. He also denies the socio-reformistic principle of elimination of profit as an economic characteristic of cooperation.

LIEFMANN'S (1921) treatment of the theory of cooperation is very scholarly. He refers already clearly to the opinion generally accepted by several modern economists according to which cooperatives are

associations of independent economic units striving for promotion of the activities of the members. Although LIEFMANN (1921, p. 142) realises the non-independence of cooperatives—"Im Gegensatz zu den Gesellschaftsunternehmungen sind sie nicht Vereinigungen mit selbständiger Erwerbstätigkeit, sondern sie wollen die private Wirtschaftstätigkeit ihrer Mitglieder nur fördern und ergänzen"— he does not, however, describe their activities quite adequately in a positive sense but mentions only "dass sie einer anderen Sphäre als dem privaten Ertragsstreben angehören".

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other principal problems is very clear in its brevity and numerous references to his work will be made later in this study.

CLARK (1952) seeks in his technically well developed analysis to establish the distinctive features of the cooperatives and private profit firms. On this basis he then proceeds to study the operating results in

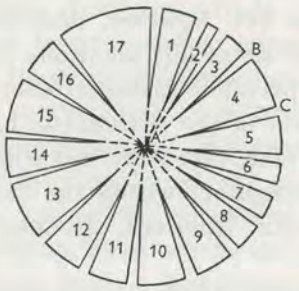

Fig. 1.

terms of welfare analysis to see whether the cooperative form of organization leads to better distribution of resources from the social point of view. Interesting as this study is, the conclusions and generalizations made do not, however, seem to be justified.

Among the interpretations on the economic nature of cooperatives PHILLIPS' (1953) work seems to represent the latest stage of development so far. He visualizes the cooperative structure in the form presented in Figure 1, where the triangular numbered sections illustrate the member firms and the small uninscribed circle in the middle denotes the joint plant. Each member firm is presented by a proportional section in the joint plant whereas there is no connection of activities between the member firms except in the joint plant.

PHILLIPS' study also offers a very interesting contribution to the contemporary technical equilibrium analysis, although some reasons to principal disagreement seem to be unavoidable, as will be found later. It is to be noticed that his work is extended to include dynamic considerations, also. A closer examination of this part of the analysis falls outside the present study, however.

The short review of literature presented above reveals the lack of theoretical economic study in the field. The works available are mostly concerned with external characteristics of the cooperatives, whereas the principal problem of the inner relationships between the cooperative and its members has mostly been neglected. The only noticeable exceptions seem to be the studies made by LIEFMANN, EMELIANOFF, ROBOTKA, CLARK and PHILLIPS.

1.2. Specification of the Problem

A student of cooperation has two alternative modes of procedure. The choice depends on the basic attitude taken as regards the context of the concept itself. If cooperation is taken to mean merely the conduct of a multitude of existing cooperatives, the task of the theory is simply to eliminate all inessentials and to present the generally adopted features of the particular phenomenon. This manner of proceeding may be considered justified for a part of the study, but its acceptance as the only basis for economic research is questionable, to say the least.

On the other hand, the student may look upon cooperation as an institution striving toward a particular economic end and upon cooperatives as aggregates formed to attain this goal. In this case the evaluation of the behavior and principles of existing cooperatives in the light of the economic end is brought to the foreground. Actually the theory would then be a body of guiding principles which independently show the direction for conduct.

The latter type of interpretation has been followed by, e.g., CLARK (1952) in a study which as such deserves special attention. When evaluating the internal relationships between the explicit objective adopted by the cooperatives and their manner of operation in practice, he states (CLARK 1952, p. 51): "Thus while they [the cooperative managers] may have been expressing verbally what would be the most advantageous goal for their patrons, they may in fact have been pursuing unknowingly the wrong goal", thus laying the stress in his analysis on the goal of cooperation as such.

To state it critically: The student of cooperation must choose whether he wishes to direct his study to an economic institution formed by bodies calling themselves cooperatives but not actually being true cooperatives, or whether he should concentrate his effort on something truly cooperative but possibly non-existent. In other words, should the purpose of the study be to elucidate the characteristics of existing consumer and producer cooperatives as well as of cooperative banks and dairies, or in general the characteristics of all the associations which operate under the laws enacted for cooperatives? In other terms, should the definitions be based on these characteristics without reference to the contradictions that might be found between what is stated by the associations to be the goal of their activity and what their actual operating policy is?

It seems only natural that the goal in the sense described above

should have particular significance in many cases within the field of economic research. However, it is questionable whether the goal can play any role in a scientific theory—or, *vice versa,* is it justified to regard a study restricted by the specific rules for conduct as scientific? SOMBART (1930, p. 324) regards an interpretation of this type as merely technological, or, in his own words: "Während die Wissenschaft das erforscht, was ist, will die Kunstlehre das erkunden, was getan werden muss, w e n n ein bestimmter Zweck verwirklicht werden soll." He is here also leaning on the Anglo-Saxon opinion presented by MILL (ref. SOMBART 1930, p. 325): "*Science* is a collection of truths, *art* a body of rules or directions for conduct. The Language of Science is: this is or this is not; this does or does not happen. The Language of *Art* is: do this, avoid that."

The task of scientific economic research, consequently, is not to state rules of behavior. The attitude that science takes toward the goal is different, its task being to lay the basis, to form a standard against which any behavior can be evaluated, or, as stated by BOULDING (1948, p. 5): "The purpose of any analytical treatment of material is to provide a body of principles according to which facts can be selected and interpreted." Here again SOMBART (1930, p. 333) has a definite expression on the special nature of this selection and interpretation: "(1) Sie kann zwar keine Antworten geben, aber sie kann F r a g e n s t e l l e n und damit auf die Probleme hinweisen, die wichtig sind und ihre Zusammenhänge aufweisen; (2) sie kann durch ihr System und seine Begriffe O r d n u n g in die Köpfe der Kunstlehrer und Praktiker bringen . . .; (3) sie kan durch die Aufweisung der Sinngesetzmässigkeiten dem praktischen Handeln die G r e n z e n seiner Wirksamkeit abstecken."

A very important reason why a strictly scientific work cannot include directives for conduct is that rules necessarily imply valuations which in many cases cannot be objective. It is not the task of the research worker to appraise between, for example, economic and social considerations. On the other hand, if an economist points to some discrepancy in the phenomenon studied and declares the consequence, it should not be understood as an advice. In this respect there has been some disagreement between students of cooperation. As a typical case, ARESVIK's (1955) reasoning due to some conclusions in PHILLIPS' (1953) theory can be noted in this connection. Referring to the criticism that PHILLIPS has addressed, formal equilibrium conditions as starting-point, to the principle of equal voting, ARESVIK (1955, p. 402) remarks: "There is, however, an error in PHILLIPS' ap-

proach, namely that a formal analysis of the conditions for an optimum also can give basis for conclusions about appropriate institutional arrangement." Now, it is all right if PHILLIPS' theory just points out some features in the cooperative practices that seem to be contradictory when regarded strictly from the point of formal economic analysis. On the other hand, to suggest changes to the prevailing system—or to defend the present practices—would imply value judgements which today are impossible.

A scientific theory of cooperation should therefore involve a generalized, logical and systematic interpretation of the nature of cooperation and its goal, so developed that the consequences of different practices can be evaluated from the economic aspect.

An attempt to reveal the economic nature of cooperation in this sense should be conducted in two parts:

(1) An interpretation of the structure and behavior of the cooperative association: the microeconomic approach;

(2) An examination of cooperation as a part of the economic system: the macroeconomic approach.

In the present study the analysis is mainly microeconomic; reference to macroeconomic aspects will be made in a few cases only. This limitation of the subject matter seems to be necessary, since only after the formulation of a complete, indisputable picture of the behavior of individual cooperative associations can macroeconomic problems be solved. Economists have tried in some cases to solve advanced problems without a clear picture of the basic issues, leading to some incorrect conclusions although the treatment itself might have been correct and perhaps very scholarly, as for example the welfare study by CLARK (1952).

Secondly, the need of an independent microeconomic theory is stressed by the fact that in some cases the interests of an individual cooperative do not coincide with the goal (e.g., with respect to price policy) of the cooperative movement as a whole. In some cases, for instance, it has been necessary to fuse certain unprofitable cooperative plants with more profitable ones in order to retain domination in the industry. Thus, an action derived from what is regarded as the best interest of the movement as a whole might at the same time cause considerable losses to the members of a certain individual cooperative.

Thirdly, it seems to be impossible at present to form a general macroeconomic theory of cooperation. Before solving problems at this level it is necessary to specify the field within which the cooperative activity takes place. If, for example, the possibilities of maintaining

a monopoly position in the cooperative type of business organization should be studied, the answer depends on the particular commodity that is in question, i.e., on the nature of the supply and demand for this commodity. Consequently, these problems should be dealt with in special studies, the theory developed in the present work thus remaining at the microeconomic level.

1.3. Independent and Non-independent Firms

The subject of analysis in the present study is business activity, which term is used to designate the production and delivery of various new commodities by means of using existing resources. The organized units that carry on continuous business activity are designated by the general term of firms. The new commodities produced will be called output and the resources used input.

Thus the activity of a firm comprises two components: (1) The utilization of resources, i.e., use of input necessary for the production and delivery of the output, which involves a sacrifice, or *cost,* for the firm; and (2) the delivery of output against compensation, which from the viewpoint of the firm is regarded as the *return.* On the other hand, in defining a firm it is not considered warranted to specify any particular relationship between return and cost as the goal. This is, perhaps, a deviation from a rather general usage, according to which one of the essential elements of a firm is a striving to obtain for its output a return which to a maximum extent exceeds the costs sacrificed for input. It is merely implied in the present study that the activities of the firm involve in this respect a rational striving toward the goal set, which need not necessarily be the maximum difference between total return and total cost, i.e., profit maximization. Thus understood the concept of a firm attains a broader sense than is generally given to it in the theory (cf., e.g., BOULDING 1948). It is to be taken into consideration that the activities of a given firm may also be subordinated to the needs of several other firms or economic units in ways other than the *independent* striving for profit maximization. In view of other important functional and organizational similarities, it is not regarded to be justified to exclude these from the concept of firm.

What has been said above does not imply, however, that the striving for profit would not be an essential feature of the concept of a firm. The purpose is merely to make it open to question whether the

independent striving for profit maximization is an indispensable prerequisite for a firm. The need for the extension of the concept is necessary since if the striving for profit maximization should be considered as an indispensable prerequisite, cooperative associations—or at least a considerable proportion of them—would be excluded from the concept of the firm.

However, since firm is used as a general term for the organized units that carry on continuous economic activity, a classification which is based on the criterion of profit seeking is necessary for the purposes of this study. The classification on this basis leads to two main categories: (1) independent firms or enterprises, and (2) non-independent firms. In the first group are included the firms whose ultimate object is profit maximization and in the second group the firms that are subordinated to the needs of other economic units, firms without independent economic goal. The nature of non-independence of the cooperatives will be discussed later.

1.4. Method of Study

1.4.1. *General Nature of the Method*

To the persons acquainted with economic theory the objective set above for the present study will give a clear indication of the nature of the method to be followed in this analysis. The treatment of the theory of the firm (enterprise), which moves at the microeconomic level and to which considerable attention has been paid during the past few decades, offers a natural framework for the study intended. Although the goals of an enterprise and a cooperative are not identical, they perform, from the general point of view, the same operations, i.e. business activity, in the existing exchange economy. It is therefore natural, when an effort is made to study cooperation as an economic phenomenon, that concepts formulated in the development of the theory of the firm may be utilized and that a similar method of analysis may be followed. Such a method of study is all the more to be recommended because it offers a possibility for comparison, on the same basis, of the activities of enterprises and cooperatives. The conventional theory of the firm and especially the concepts developed are therefore briefly reviewed below in such form and extent as is necessary for the present analysis.[1]

[1] For a uniform presentation of the theory of the firm cf., e.g., CHAMBERLIN (1950).

The object of the theory of the firm is to clarify the behavior of a single enterprise, in contrast to economic research moving at the macroeconomic level and operating with the overall concepts of national economy. As is well known, the theory is based on the idea that each single enterprise strives to attain equilibrium, which is determined by the goal. Since the goal of the enterprise, according to the theory, is the maximization of profit, equilibrium is attained when the enterprise, in the situation concerned, has no possibility of increasing its profit by means at its disposal. BOULDING (1948, p. 469) defines this concept as follows: "A single enterprise is in 'equilibrium' when the one who undertakes it (the 'entrepreneur') has reason to change none of the quantities which are under his control; neither the quantities of input which he buys, nor the quantities of output which he sells, nor any prices which he may control. The equilibrium output of an enterprise, therefore, is that which it is not profitable to change."

Since this equilibrium analysis is performed chiefly by the method of functional return and cost study, its is necessary to review briefly the nature of cost and return functions of the firm.

1.4.2. *Return Function*

Generally the return function may be expressed by the equation

$$R = f(q; p), \tag{1}$$

where the return R in terms of money value is a function of the quantity of output q and the value of output, i.e., the price p obtained for the products. Theoretically, the output may be measured best in relative units. The question may then be viewed as an entity regardless of whether the output is composed of uniform or of several different products.

The function of return is usually depicted by a graph in which the value or price is measured on the vertical axis and the quantity of output on the horizontal axis by means of curves for total, average and marginal return. The total return R_T is, naturally, the value obtained for the total quantity of output. If the units of output are designated by $q_1, q_2, \ldots, q_n$ and the prices of units of output correspondingly by $p_1, p_2, \ldots, p_n$, we can write the formula

$$R_T = \sum_{\gamma=1}^{n} q_\gamma p_\gamma. \tag{2}$$

The average return R_A is the return obtained per unit of output:

$$R_A = \frac{R_T}{\sum_{\gamma=1}^{n} q_\gamma} \tag{3}$$

The marginal return R_M is the increase of total return accrued from the last unit of output:

$$R_M = \frac{R_T - \sum_{\gamma=1}^{n-1} q_\gamma p_\gamma}{q_n} \tag{4}$$

The variables in the return function—the output and the price—are characterized by an interdependence, in the sense that the entrepreneur generally cannot control the two simultaneously. For example, if the object is to attain a given output, the prices are beyond the control of the entrepreneur, and *vice versa*. However, the reciprocal relation between the variables is not always similar, and to develop the theory further it has been necessary to formulate certain hypotheses from the factors which influence this interdependence.

In seeking to clarify more closely the return function it thus has been necessary to construct various typical market situations, which are grouped according to the factors which essentially influence the development of the situations. Significant in this respect are considered to be, above all, the number of competing enterprises, the possibilities of entry of new enterprises and the degree of differentiation of the product concerned.

In speaking of the degree of product differentiation in a certain enterprise a question is raised as to the possibility of obtaining identical products from other enterprises in the industry. For the recipient of the product the criterion of identity is whether or not he can consider that the products of different enterprises can substitute for one another completely. Differentiation may be based upon, for example, certain characteristics of the product itself or peculiarities of the package or it may also exist with respect to the conditions surrounding its sale, such as convenience of the location, courtesy in customer service, or generally all the features which lead the customer to prefer the product of this particular firm, i.e., the combination of commodity purchased and service received, to the corresponding product of other firms in the industry.

The grouping of the typical market situations presented below, is formulated mainly according to the terminology of CHAMBERLIN (1950).

	Number of competitors	Possibilities of entry	Degree of product differentiation
Pure competition	Large	Free	Homogeneous
Monopolistic competition	Large	Good	Differentiated to some degree
Oligopoly (Duopoly), perfect	Few (two)	Difficult	Homogeneous
Oligopoly (Duopoly), imperfect	Few (two)	Difficult	Differentiated
Monopoly	One	Impossible	Completely differentiated

In this connection it is important to note in particular the changes in average and marginal return in different market situations when the output is variable. Under pure competition the average return obtained by each enterprise from its products is constant and it thus forms a horizontal line in a graphic presentation. When the whole output can be sold at a uniform price the average return and marginal return are equal. In all other market situations the average return declines with an increasing output. Each firm can increase the demand for its products by reducing the price, but to a limited extent only. Likewise, the demand does not cease completely when the price increases, as is the case under pure competition, but is merely diminished to some extent.

In this respect monopolistic competition bears the closest resemblance to pure competition. Supposing that product differentiation occurs typically by means of, for example, good customer service or an especially attractive packing, the customers naturally are not willing to pay much higher price for these particular products than for their substitutes, or the other way round. Under monopolistic competition the typical curves for the average and marginal return therefore have a relatively gradual slope.

Under conditions of oligopoly, the entrepreneurs' sales are, because of the small number of competitors, usually effected less by the price changes than under monopolistic competition. Naturally an imperfect oligopoly with product differentiation is in this respect still more favorable to the entrepreneur than perfect oligopoly.

An analysis of firms in oligopoly and monopoly situations shows that the difference in their return functions is dependent on the relationship between the total market demand for the product (industry demand) concerned (together with its substitutes) and the demand for the product of the single firm. For clarification of this relationship

The average return R_A is the return obtained per unit of output:

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In this respect monopolistic competition bears the closest resemblance to pure competition. Supposing that product differentiation occurs typically by means of, for example, good customer service or an especially attractive packing, the customers naturally are not willing to pay much higher price for these particular products than for their substitutes, or the other way round. Under monopolistic competition the typical curves for the average and marginal return therefore have a relatively gradual slope.

Under conditions of oligopoly, the entrepreneurs' sales are, because of the small number of competitors, usually effected less by the price changes than under monopolistic competition. Naturally an imperfect oligopoly with product differentiation is in this respect still more favorable to the entrepreneur than perfect oligopoly.

An analysis of firms in oligopoly and monopoly situations shows that the difference in their return functions is dependent on the relationship between the total market demand for the product (industry demand) concerned (together with its substitutes) and the demand for the product of the single firm. For clarification of this relationship

it may be appropriate to make a brief comparison of the concepts of return and demand. Demand, as is known, designates the various quantities of product which it is possible to sell at various prices, in other words quantities of product sold as a function of price. When we now keep in mind that average return is understood to mean the average price obtained per unit of product, which price is expressed as a function of output, it will be observed that return and demand are two very closely allied concepts. Thus the curve for average return is fully identical with the curve for the demand for the product of the firm. The aspect from which the matter is viewed will solely determine which concept is to be used.

The demand for the products of a monopoly is, obviously, equal to the total market demand, and the monopoly return function is identical with the total return of the market. The demand for the products of an oligopoly enterprise, on the other hand, is representative of only such a proportion of the total demand as is determined by the number of competitors and their output. Thus oligopoly enterprises in their behavior should always take into consideration the reaction of competing enterprises, so that, for instance, when an oligopolist is raising the selling price he cannot expect[1] that the decrease in his demand will only be proportionate to the decrease in the total market demand following a similar general price increase, but that it will be somewhat greater. A relatively great reduction in the demand is naturally a result of the existence of competitors, whose sales are increased because of the price increase instituted by one oligopolist. Owing to these factors characteristic of the oligopoly situation, the curve for the average return of a single oligopolist appears to be more gradual than that of a monopolist who is able to operate over the range of the total demand for the product.

1.4.3. *Cost Function*

Before taking up an analysis of the cost function it is necessary to deal with the concept of cost in the sense in which it is employed in the theory of the firm and thus also in the present study. Obviously a definition of cost must in this connection also rest upon the concept of output, which was central in the above discussion of return. Thus cost is the expenditure arising from the utilization of the resources or input required for production of the output.

[1] Not regarding certain exceptions.

The cost required for production of the output is considered to be dependent (1) on the quantity of output, (2) on the prices of the resources utilized in the production, and (3) on certain technical factors. The theory presumes that the prices of the resources utilized are known. This may be understood either in the sense that the prices remain constant regardless of the quantity of these resources, used in the firm concerned, or in the sense that the change in the prices that takes place with change in the quantity of resources used is known. In neither case the prices of resources used form a problem in the theory.

It is also presupposed that a solution has already been reached in principle regarding technical questions. These refer to the selection and combination of the resources necessary for production. If the prices of the resources are dependent on the quantity of output, it is assumed that the effect of such changes on the selection of the resources and the proportions of their utilization are known. On the other hand, it is not indispensable in defining the cost function in the theory of the firm to eliminate the changes in the proportions and prices of the resources. This would unnecessarily render the theory unrealistic. There is furthermore no reason which would warrant the elimination of the effect on the cost formation of some given factor which is dependent on the quantity of output. It probably is necessary and correct to assume merely that it is known how these changes occur in order that the costs of the enterprise may be determined when the output is increasing or decreasing.

The cost function may now be expressed generally by the equation:

$$C = f(q; c), \tag{6}$$

indicating that the cost C expressed in terms of money is a function of the quantity of output q and of the money value c of the input used for production of the output; c is here, of course, a function of the quantity or resources used and of the price of the resources.

In a similar manner as in the previous chapter, it is important to define the concepts of total, average and marginal costs. Thus the total cost C_T is

$$C_T = \sum_{\gamma=1}^{n} q_\gamma c_\gamma , \tag{6}$$

where the units of output are $q_1, q_2, \ldots, q_n$ and the money values of the corresponding units of input used are $c_1, c_2, \ldots, c_n$. When the aver-

age cost C_A is taken to mean the cost per unit of output, it may be expressed

$$C_A = \frac{C_T}{\sum_{\gamma=1}^{n} q_\gamma} . \tag{7}$$

The marginal cost C_M is the increase in the total cost resulting from the last unit of output:

$$C_M = \frac{C_T - \sum_{\gamma=1}^{n-1} q_\gamma c_\gamma}{q_n} . \tag{8}$$

Before undertaking to study more closely the changes in cost it is necessary to consider briefly the manner in which changes in the quantity of output of a firm occur. It already has been stated above that the output is best measured in relative units in order to avoid disturbance in the analysis by heterogeneity of the products.

For the needs of this study it is necessary to consider in this connection the possibilities of a firm to accomplish changes in its output. In theory the resources used in production might be classified as fixed and variable inputs. As examples of the former buildings and heavy machinery could be mentioned. Typical variable inputs are, for instance, labor and fuel. The firm may now change the quantity of its output by using larger or smaller quantities of the variable input. But in the long run the firm may also change the quantity of the inputs that in the short run seemed to be fixed and so to increase output. It is necessary, therefore, to define as variable inputs those which it is possible to change in the short run and as fixed inputs those which can be changed only in the long run.

However, the possibilities of a firm to increase the quantity of its output are limited for technical reasons. The maximum quantity of output that a firm can produce during a unit of time within the technical limitations is termed capacity. It is to be noted that according to the definition given an increase in fixed inputs means increase in capacity, changes in output being thus solely dependent on the quantity of variable input used.

Sometimes it has been desired to regard capacity not only as a technical but also as a technical-economic concept. In this case the capacity is defined on the basis of the quantity of output which is optimal from the point of view of the firm (cf., e.g., MELLEROVIC 1952). The optimum situation referred to could be made dependent either

upon the cost function alone or upon both the cost and the return functions. In the former case the optimum would be determined by the minimum of average cost, and in the latter case by the maximum of total profit.

However, the consideration of economic factors in the determination of the concept of capacity would carry with it certain drawbacks. Especially undesirable would be the fact, that the capacity would then become a variable depending on price developments and relations. As a concept, in the formation of which attention has been paid to technical aspects only, and which corresponds best to the requirements of the present study, capacity will be considered in the following in the form first defined.

Since in the measurement of the quantity of output the scale, as mentioned before, has to be based on relative values, it is natural to regard capacity as the basis of comparison in the compilation of the scale. Thus the level of output refers to the percentage in which the capacity of the firm is utilized.

1.4.4. *Shape of Average Cost Curve and Validity of the Marginalistic Theory*

On proceeding now to review the change in the cost following a change in the quantity of output it is apparent that this is essentially a question of cost at variable degrees of utilization of capacity. According to the most widely accepted theory, the average cost, which generally is employed to depict the cost factor, at first decreases with increasing output until the minimum is reached at a given output and then an increase sets in. In a graph, the average cost curve is therefore usually shown in U-shape.

The factual prevalence of a cost movement of this type is considered by some workers to be open to question. Efforts have been made (e.g. EITEMAN 1952) to prove that the typical curve for average cost slopes downward throughout its length when the capacity of the firm is regarded as the limit. Since this question undoubtedly is of great significance for the validness of a theory of the firm, it deserves to be given serious consideration. For this the concept of profit maximization must be described briefly.

The total profit P_T is the difference between the total return and the total cost at different quantities of output:

$$P_T = R_T - C_T. \tag{9}$$

An increase in the output, however, is possible only within the limits

of capacity or within the range of certain technical factors. As stated above, these technical problems are assumed in the theory of the firm to have been solved and consequently the actual output $Q = \sum_{\gamma=1}^{n} q_\gamma$ within the limits of capacity will remain dependent only on the size of the profit at different levels of output. The maximum total profit is attained when the cost resulting from the production of the last unit of output equals the return accrued from it. By derivation from equation (9) we find:

$$\frac{dP_T}{dQ} = \frac{dR_T}{dQ} - \frac{dC_T}{dQ} = 0 . \tag{10}$$

To obtain the maximum the derivate is expressed as zero, and the following equation is obtained:

$$\frac{dR_T}{dQ} = \frac{dC_T}{dQ} . \tag{11}$$

Thus the profit is at maximum when the increments to the return and the cost resulting from the last unit of output are equal,

$$R_M = C_M . \tag{12}$$

Assuming that the average cost curve would generally slope downward throughout its length it would be difficult to interpret the behavior of enterprises by the present theory, should the average return be a constant or should the decrease in the average return with increasing output be small in relation to the decrease in cost. In such cases there exists no quantity of output at which equation (12), which is important for the theory of the firm, could be realized. The marginal return would then exceed the marginal cost throughout the range of capacity and the behavior of enterprises would be governed solely by the general rule of maximum utilization of capacity.[1]

However, it is now to be particularly noted that the continued decrease in average cost down to the limit of capacity does not in itself necessarily form a hindrance to the application of the marginalistic theory, i.e., of a theory based on the concepts of marginal return and marginal cost, in explaining the behavior of enterprises. A method based on marginalism lacks basis only in the case that the decrease in the marginal return with increasing output within the range of

[1] This, of course, may also be explained by the marginalistic theory. The kernel of this question, however, is to study whether a theory based on marginalism can be employed to explain the behavior of a firm, and not *vice versa*.

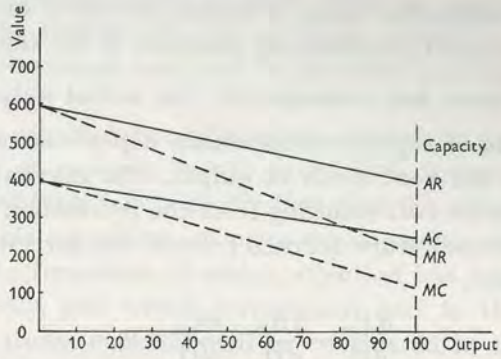

Fig. 2. Hypothetical example of enterprise in which the marginal return exceeds the marginal cost throughout the range of capacity.

capacity does not attain the marginal cost. A graphic presentation of the question under review is readily obtained from Figures 2 and 3.

If the operating conditions of the enterprise are such that with increasing output the marginal return exceeds the corresponding marginal cost throughout the range of capacity, as for example in Figure 2, the rational goal of the enterprise is necessarily to proceed toward the maximum utilization of capacity, which will yield the maximum profit.

If, on the other hand, the operating conditions correspond to those of the example in Figure 3, the situation fully conforms to the marginalistic theory. When the output is 71, the marginal return equals the marginal cost and the maximum profit will be obtained.

For determination of the validity of the theory it would now be interesting to know how common the alternatives presented are. Consideration should especially be given to determination of how frequently the costs in reality decline so greatly that the marginal return within the range of capacity does not attain the marginal cost. However, it is very difficult to obtain an objective solution of this question, and only very extensive studies based on empirical data would be able to give a clear view of the conditions. Investigators (cf. MELLEROWICZ 1952) have presented a few examples to demonstrate the possibility of increasing cost, and attempts have then been made to clarify the frequency by theoretic means. It has been stressed particularly that the development of costs as a function of output is a result of the combined effect of cost tendencies. As factors which in the presence of increasing output tend to increase the average cost are usually mentioned (cf., e.g., BOULDING 1952):

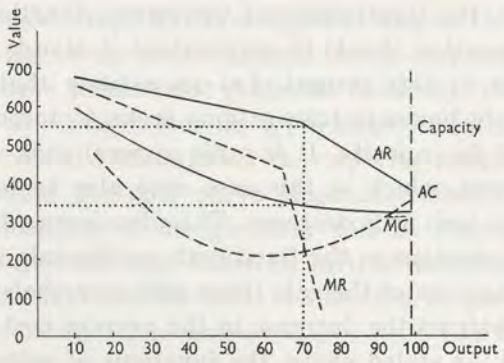

Fig. 3. Hypothetical example of an enterprise in which the marginal return and marginal cost curves intersect even when the average cost slopes downward throughout the range of capacity.

(1) The law of diminishing marginal physical productivity;

(2) the significance of fixed costs as a factor decreasing the average cost declines with an increasing quantity of output;

(3) the original tendencies of the different types of costs do not remain the same but change with a continuously increasing quantity of output;

(4) an increase in the quantity of output may give rise to entirely new types of costs as additional tasks not previously present become indispensable.

Some interesting exceptions from this purely theoretical approach have been offered during the last few years. Among these EITEMAN's (1952) investigations, the purpose of which was to refute as erroneous the generally accepted idea of cost developments could be mentioned. As evidence supporting his allegation EITEMAN uses the results of an opinion study conducted by him. The managers of a large number of firms were shown eight average cost curves of different shapes from which each one was to select that which best conformed in his opinion to the movement of cost within the capacity range. In interpreting the replies received, EITEMAN classified the cost curves into two groups, those supporting marginalism and those conflicting with marginalism. However, in the latter he even included a curve showing a slight rise in costs before the capacity was reached. RITTER (1953), in his clear-cut reply, pointed rightly to the fact that in this case the marginal cost curve lies considerably higher than the average cost curve already within the range of capacity, and that the intersection of the curves for marginal return and marginal cost is therefore very probable.

On the whole, the significance of the return function in the study of the present question should be emphasized. A simple example might shed some light in this respect. Let us assume that an enterprise conducting purely business transactions seeks to increase the degree of utilization of its capacity. It is quite general that with increasing quantity of output, which in this case may also be termed sale, the average cost per unit will decrease. This development may probably be ascribed to reduction in the fixed costs as the sale increases. With the continued increase of the sale there will nevertheless arise certain factors which obstruct the decrease in the average cost, as it has been already notified. As stated above, the functions of return and cost are not, however, simultaneously under the control of the management of the entrepreneur. If the entrepreneur in our example desires to increase his sale in order to benefit from the decrease in cost he cannot maintain fixed prices. The prices must be reduced to increase the sale, and this will lead to a reduction in the average return. The market situation will determine how much the prices must be reduced in order to effect a given rise in sales and it also determines whether the effect of the price reduction on the return will be greater than the reduction in cost obtained by increasing the output.

Among the factors which in this respect are important in the above-mentioned situation we shall here mention only loyalty to the ideologies represented by given types of firms. A private dealer may find it necessary to reduce his prices very considerably before the customers of a cooperative store change their usual source of purchases. It is also to be taken into consideration that the competing firm will presumably also reduce its prices. As the validity of the marginalistic theory in this respect[1] is also dependent on the return function, the frequency of different market situations therefore plays an important part in the question under discussion.

When, as a conclusion, we endeavor to summarize the above presented discussion of the shape of average cost curve and the validity of the marginalistic theory, the following brief statements may be made:

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[1] The validity of marginalism may, naturally, be considered open to question also for reasons other than those presented here. It has been stated, for instance, that entrepreneurs do not base their decisions on marginal return and marginal cost. It is not considered possible to discuss this and other interesting aspects in the present connection, however. We can only refer here to the fact that the striving for profit maximization must in itself be regarded as marginalism, no matter what the considerations are on which the entrepreneur in question bases his decisions for profit maximization.

In the first place, empirical investigation has so far not definitely demonstrated what is the general shape of the cost curve, although a U-shaped cost curve seems most probable. Secondly, the marginalistic theory does not in all cases lose its applicability even if the cost curve should slope downward throughout the capacity range. Thirdly, it is evident that should the cost curve slope downward throughout its length the applicability of marginalism will be dependent upon the shape of the return function, which in turn is dependent on the particular type of product and the market situation in question.

2. Cooperation as a Form of Economic Activity

2.1. Definition of a Cooperative Association

In conformity with the nature of the present study, the concept of a cooperative association is here considered only from the purely economic aspect, disregarding the social features of the movement. The definitions of a cooperative as given earlier in the literature form a suitable point of departure for an examination in this sense. Since EMELIANOFF (1948) has already reviewed in great detail the concepts of the pioneer investigators, and since the subject has already been dealt with in the foregoing review of the literature, it seems to be sufficient in the present connection to consider only the various typical forms of definitions, without paying attention to minor dissimilarities.

Three phases may be differentiated in the development of the concept of the cooperative. The first group of investigators, which can be considered to have become free from the social interpretation of the question, is well represented especially by STAUDINGER (1908), KAUFMANN (1908) and JACOB (1913). Their definitions are characterized by the concepts that (1) a cooperative is an association of individuals not of capital and (2) the business activities of a cooperative are related to the activities of its members which by this means bring them benefit. Already by the definition of a cooperative these investigators desired to differentiate cooperatives from other firms using as criterion the status of capital in the business. In the present study, on the other hand, as will later be seen, the attitude of a cooperative toward capital is regarded as a corollary of the general principle of operation; in other words, the nature of integration of operations determines the status of the capital. It thus may be held that a classification of firms into two groups, those in which capital governs and those where it serves, is a vestige of the socio-ethical concept of cooperation. On the other hand, emphasis on the aspect that the benefit obtained from the cooperative by its members is allied to the activity of the members is in close harmony with the concept presented in this study regarding the nature of a cooperative.

LIEFMANN (1927, p. 141), representing the second phase in the development of the concept, no longer paid attention to the personal characteristic of cooperatives in stating that "Genossenschaften sind Wirtschaften, die mittels gemeinsamen Geschäftsbetriebes die Förderung oder Ergänzung der Haus- oder Erwerbswirtschaft ihrer Mit-

glieder bezwecken". However, his definition of the relationship of the activities of the cooperative and its members is not sufficiently clear not to leave room for misinterpretation. Thus SUKSELAINEN (1938, p. 15) poses the question, "Does there exist any firm which does not have the object of promoting or supplementing the economy of its partners?"[1], thus disregarding LIEFMANN's obvious reference to the direct promotion of economic activity. This question must, however, now be left in abeyance for closer study in connection with the examination of non-independence of cooperatives. In the present connection we only stress the important contribution made by LIEFMANN to the progress of the study of this subject.

The representatives of the third phase are Americans. Among these investigators, BLACK (1926) seems to have been the first to present cooperation as a form of economic integration, but a consistent, well founded definition of the essence of integration was given by EMELIANOFF (1948, p. 248), who considers the cooperative organizations to represent the aggregates of economic units and characterizes them as follows: "a) An aggregate of economic units is a plurality or group of these units coordinating their activities but each fully retaining its economic individuality and independence. b) An aggregate of economic units finds its perfect embodiment in the cooperative associations of member-active participants (of 'member-patrons') in their common work. c) An aggregate of economic units may be described as as *center* of their coordinated activities or as an *agency* of associated economic units, owned and controlled by them, through which they conduct their business activities. d) The true economic nature of such an agency can be thoroughly understood only if we clearly keep in mind that the cooperative represents the associated economic units in their functioning and not their association as a separate economic identity; an association or aggregate is functioning only as a *branch* or *part* of associated economic units; in that respect it is perfectly identical with the special departments or branches of single economic units." This concept, which also was developed by ROBOTKA (1947) and later especially by PHILLIPS (1953), is to be considered the starting point of modern research of cooperation.

It is now possible and interesting to compare this concept of cooperation, evolved on a theoretic basis, with the legal definition of cooperation as given, for instance, in Finland. In The Finnish Cooperative Societies Act (1955, Chapter 1, § 1) a cooperative is defined as follows: "A cooperative society is a corporation whose number of

[1] Original Finnish.

members and amount of capital are not fixed beforehand, and whose object is, in order to support its members' domestic economy or trade or other enterprise (business), to carry out economic activities such that the members participate in the activities by making use of the corporation's services." In this definition, four points are of interest from the economic aspect:

(1) The cooperative is a corporation formed by its members. According to the Act (Chapter 1, § 2) these members may be individuals, corporations and foundations. It should further be noted that it is a prerequisite that the members conduct a household, trade or business. When individuals are in the legal sense members of a cooperative, such persons actually act as representatives of some known economic units in conformity with the interests of the latter. Similarly, corporations and foundations, to the extent that they participate in the activity of the cooperative, are to be regarded as economic units conducting a trade or business, i.e., as firms. The cooperative may therefore be regarded as a corporation formed by its member households or firms.

(2) The cooperative shall carry on economic activities. Thus, the cooperative is a firm and organizations with purely economic policy aims or non-profit organizations cannot be regarded as cooperatives.

(3) The members participate in the activities of the cooperative by making use of its services. This part of the definition makes it clear, in the first place, that the economic activities of the cooperative are carried out in a different stage of the production process, i.e., of the creation and progress of the commodities gradually toward consumption, than the stage in which the member households or firm operate, since otherwise the latter would not be able to make use of the services or of the outputs of the cooperative. Secondly it is to be noted that when the member households or member firms accept outputs from the cooperative for their own operations, a direct state of combination arises between these two production stages: the cooperative is serving directly its members through its activity.

(4) The object of the activities of the cooperative is to support the home economy or trade or other enterprise (business) of its members. In so defining the purpose of a cooperative the legislator has employed terminology which calls for some explanation with respect to its economic application. It was said above that a direct combination of the operation of two or more production processes is characteristic of cooperation. The nature of this combination is to be clarified in this connection. The term "to support its members' domestic economy or trade or other enterprise (business)" points clearly to the requirement

that the activities of the cooperative must be of benefit to the members. Thus defined, however, the object is not adequately exclusive to enable the formulation of an exact concept of the relationship between the cooperative and its members. For this reason it is considered desirable in the present study to formulate more precisely this part of the definition as follows: The object of a cooperative is to act as an association of its member households or firms, the activities of which shall be conducted according to principles most beneficial for all the member household or firms. A cooperative, therefore, in its economic activities shall not seek, for example, (1) to procure profit as an independent economic unit and to distribute such profit to its members, or (2) to follow a given inflexible rule of operation which to some degree benefits the activities of the members, such as, for instance, a maximum cost reduction in buying and selling. The combining of the activities of the cooperative and its members is thus clearly of the nature of integration, which is the term employed in economics to designate the situation when two successive acts in the production process or two related continuous economic functions are combined to take place under the same management for the attainment of given objects (cf., e.g., BOULDING 1948).

On the basis of the foregoing, the definition of a cooperative may now be expressed as follows:

The cooperative is an agency formed by a plurality of firms or households—the members of the cooperative—the object of which is to act as a firm of its members by carrying out economic activities directly serving the members' operations in a manner most advantageous for all of them.

2.2. Forms of Cooperative Associations

A great deal of attention was paid in the earlier literature on cooperation to the classification of forms of cooperative associations but no generally accepted basis of classification appears to have been found. It is naturally futile to expect that a solution in this matter would be reached with full unanimity and conformably with a single rule, for a classification will always depend to a great extent on the subject under consideration in each instance. If the examination concerns, for example, the economic significance of cooperation in different social groups, a division into producer and consumer cooperatives may be justified, as used, among others, by ÖRNE (1938), the socially orientated Swedish economist. On the other hand, in studying

the occurrence of a certain economic phenomenon within cooperative activity, the best light on the question may be obtained by a minutely detailed subdivision of cooperatives by their fields of activity.

In general, it is important for a study of the economic nature of cooperation to concentrate the treatment on such entities as will permit the examination of, on the one hand, the relationship between the cooperative and its body of members and, on the other hand, the relationship between the cooperative and the market, both of which are significant subjects in the clarification of the concept of cooperation and were dealt with already in the early literature. It appears nevertheless that investigators generally have regarded the principles of classification—the relationship of cooperative and member and that of cooperative and market—as alternatives.

At least no clear expression seems to have been given to the thought that the nature of cooperative activity would in itself contain a factor which would have a decisive influence on the simultaneous formation of the above-mentioned two relationships.

Thus, for instance, KAUFMANN (1908) suggests as possible bases of classification the relationship of the cooperative to economy as a whole or the relationship of members to the cooperative, and selects the first-mentioned as the primary base. LIEFMANN (1922) also recognizes the existence of both possibilities and speaks in the former case of classification according to form and in the latter case of classification by object. SUKSELAINEN (1938) assumes an opinion opposite to that of KAUFMANN (1908) in stating that he considers the relationship of the cooperative and its members as the most important base of classification.

The theoretic studies published in the United States do not usually state the reasons for the selection of the classification used in each instance. Almost without exception the distribution into marketing cooperatives and purchasing cooperatives has been employed, presumably as best answering the requirements (cf. ROBOTKA 1947, CLARK 1952, PHILLIPS 1953). It is interesting to note that this question has been left in the background, seemingly as insignificant in the study of the nature of cooperation. There appears to be a need for a classification chiefly when individual features of cooperative activity are discussed and not in the formulation of a general theory of cooperation. This point of view is most clearly seen in the study by EMELIANOFF (1948), although he does not directly declare a classification unnecessary for the comprehension of the nature of cooperation.

The standpoint taken in this question in the present study conforms

to some extent to that prevailing among the economists in the United States. A classification is considered necessary in order that unhindered attention may be paid in the detailed study to the relationship between the cooperative and its members and the cooperative and the market. Since the essential feature of cooperation is regarded to be the integration of two successive acts in the production process it would only seem natural that the foregoing requirement would be fulfilled by selecting the relationship of these acts as the base of classification.

In regarding the production process as the creation and progress of commodities by stages toward consumption, the economic activity of the cooperative may take place either (1) previous to the operations of the members, or (2) after the operations of the members. A member may either employ some output units of the cooperative in his own stage of the production process, in which case the operations of the cooperative are concentrated on the purchase from the market and on the processing of a supply item and its delivery to the members, or the member may place his own output in the hands of the cooperative, in which case the cooperative strives to market the output of the member (or the processed products thereof).

On the basis of the mutual status of the cooperative and its members in the production process, a classification is obtained which at the same time depicts the relationship between the cooperative and its members and that between the cooperative and the market. It is difficult, however, to establish a nomenclature which would fully conform to the context of the criterion applied to the two groups of cooperatives. It would naturally be possible to devise a terminology closely corresponding to the principles of classification, for instance with the prefixes *pre-* and *post-* in reference to the order in the production process. It seems, however, more to the point to employ the term "purchasing cooperative" when its operations precede those of the members, and the term "marketing cooperative" when the order in the production process is the reverse.

It is to be noted that it has not been considered necessary for the purposes of the present study to make a subclassification according to the field of operations of the cooperative or its members. Purchasing cooperatives could be subdivided into, for instance, cooperatives consisting of households (cf. consumer cooperatives), of independent firms (cf. producer cooperatives), and of non-independent firms (cf. cooperatives of the higher level). Such a subclassification would seem logical since the definition of a cooperative given above refers sepa-

rately to member households and member firms. On closer examination, however, it will be observed that such a classification is not indispensable for the formulation of a general theory of cooperation. For it must be taken into consideration that the relationships between the cooperative and members and between the cooperative and market remain the same in all cases, as the cooperative carries on business activity serving directly its members in the manner most advantageous for all the members. This relationship is not rendered dissimilar by the fact that in one case the lot of fertilizer procured by the cooperative for the farmer is used in the production process of the agricultural enterprise and in another case the package of flour procured by the cooperative for the housewife is used in the household. In both cases the aim of the cooperative is to carry out its activity in conformity to the interest of the member. The difference between households and firms as participants of cooperatives lies chiefly in the extent of planning their actions. Since both types of members are trying to make the best possible use of the association, there seems to be no particular need to treat them separately in general theory.

2.3. Economic Characteristics of Cooperation

2.3.1. *Distribution of Surpluses and Optimum Output Level*

Economically perhaps the most significant rule of the traditional doctrine of cooperation and one which is generally followed in practice decrees that the surpluses retained in the cooperative shall be distributed to members proportionately to the utilization of the cooperative by each member. If we classify the cooperatives into purchasing and marketing cooperatives, this rule will be found to signify that the refund to members in a purchasing cooperative actually constitutes a corresponding reduction in the unit price of the purchased commodities. In a marketing cooperative, on the other hand, it results in an increase of the price obtained by the member for his product. On this basis it would at first glance seem that the members of a purchasing cooperative should strive to operate their cooperative at the minimum average cost, whereas it would be to the interest of the members of a marketing cooperative to aim at a maximum differential between cost and selling price.

By examining the cost and return curves it is now possible to obtain a clear conception of the general validity of these hypotheses and, at the same time, of the question whether or not the method of

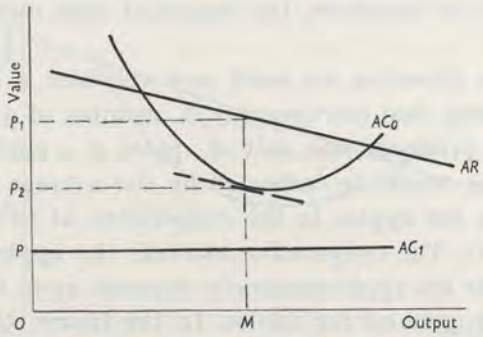

Fig. 4.

distribution of surpluses applied by cooperatives in practice contributes in the best possible manner to the attainment of the above formulated aim of operation of the cooperative. For the sake of clarity, the different market situations are not separately dealt with at this stage of the study, the example here employed being regarded as chiefly illustrative of a monopoly situation in which it is possible for the cooperative to determine freely its output level (cf. CHAMBERLIN 1950) and in which the procurement of surplus is thus possible.

Let us consider, in Figure 4, a marketing cooperative which markets a given product of its members. Curve AR here represents the average selling price of the product or the average return of the cooperative at various output levels and it is at the same time the demand curve for the product of the cooperative. In the monopoly situation under consideration the demand curve, from the point of view of the single firm, can be supposed to slope, as shown in the figure. This is naturally due to the circumstance that a firm operating under given conditions can usually increase sales only by reducing the price.

Curve AC_1 designates the average cost function of production per unit of product of the member firms so that the costs of all the individual producers are considered to be equal and independent of the quantity of production in each member firm (AC_1 horizontal). AC_0 denotes the average operating cost of the marketing cooperative plus the corresponding production cost of the member firms. Thus, if value OP is deducted from the values of curve AC_0 at different output levels, the marketing cooperative's average operating cost function is obtained as shown by the curve AC_0 when read upwards from the line AC_1. The output level of the cooperative is considered to de dependent solely

upon the number of members, the output of each member firm being constant.

To clarify the situation we shall now consider a hypothetical example. Let us think that entrepreneur A, member of a fruit marketing cooperative, has produced one unit of apples at a cost of 4000 marks. In the figure this would be indicated by the average production cost *OP*. A now sells his apples to the cooperative at first at production cost price (4000). The cooperative markets the apples and the price obtained by A for his apples naturally depends upon the cooperative's total output and demand for apples. In the figure, *OM* is the actual level of output of the cooperative. The price obtained for the apples is, let us say, 10,000 marks, corresponding to the unit price OP_1 in the figure. Assuming that the operating cost of the cooperative corresponding to PP_2 in the figure is 3000 marks for the unit of apples the surplus to the cooperative from A's apples and the amount to be refunded to A will be $10{,}000-(3000 + 4000) = 3000$. Correspondingly, when the output level is *OM* the average operating cost of the cooperative is PP_2, leaving $OP_1 - (OP + PP_2) = P_2P_1$ per unit as profit to be refunded to A.

Thus the difference between curves AC_0 and AR is the average profit obtained by the members at the various output levels of the cooperative when the surplus is considered as being refunded to the members in full. The maximum of this average profit, i.e., the greatest difference between AC_0 and AR, will be found in the figure by drawing a tangent to AC_0 parallel to AR (cf. CLARK 1952). The optimum output level *OM* can be determined by means of the point of tangency. Any expansion or curtailment of the output of the cooperative from this level would result in a reduction of the profit due to each member. Since the goal of a cooperative is to carry on economic activities in the manner most advantageous to all its members, the above-mentioned aim towards the maximum per unit differential between cost and selling price thus meets the demands to be placed upon an operation principle of marketing cooperatives. However, it is particularly to be emphasized that the final treatment of this question will be possible only later in connection with the examination of cooperation as a form of integration.

In undertaking now to examine purchasing cooperatives we must recall to mind the forementioned traditionally repeated general rule that the principle of distribution of surpluses proportionately to the patronage or to the utilization of the cooperative would lead to an effort to operate at the level of minimum average cost. According to a

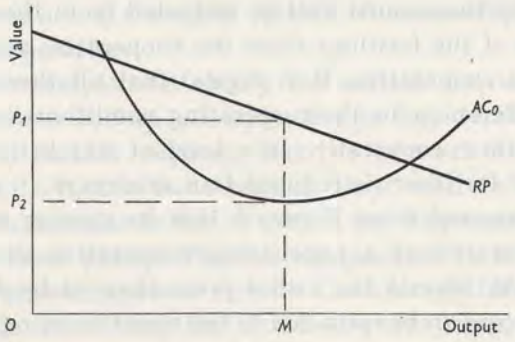

Fig. 5.

certain line of reasoning this conclusion is indeed possible, and in order to show the limitations of this idea, such an artificial construction will be formed in the following.

Let us assume, for example, a case where members purchase through their cooperative a certain quantity of fertilizer, by use of which they obtain a given crop increase. This crop increase is naturally in the first place dependent upon the internal production factors on the farm, as for instance the type of soil etc. However, if for example location, i.e. distance between the cooperative and the member's firm, is also considered as a factor affecting the return obtainable from the supply item, the extension of the output level of the cooperative results, as the number of members increases, in a decreasing trend in the return for the new members. Thus the curve *RP* in Figure 5, which indicates the return from the supply item purchased in different member firms, slopes when the output level of the cooperative is extended by new participating members. It is to be noted that each entrepreneur occupies its own place on the *RP* curve, determined by its location.

Under these conditions it is natural that the interest of all members of the cooperative will be to minimize the average operating costs of the cooperative.

By reverting to the foregoing example of purchase of fertilizer this question will be clarified. Let us assume that the crop increment on three farms A, B and C is valued at 10,000, 9000 and 8000 marks respectively. The transportation costs are assumed to be 400, 800 and 1200 marks. If the production cost required for the crop increment is, say, 4000 marks on all the farms, the balance remaining of the original crop increment will be 5600, 4200 and 2800 marks, respec-

tively. Naturally there must still be deducted from these balances the purchase price of the fertilizer from the cooperative which is equal to the cost of the cooperative. It is logical that all three members, regardless of differences in their operating conditions, desire to bring the output of their cooperative to a level at which the average cost, i.e. the price of fertilizer, is reduced to a minimum.

It will be observed from Figure 5 that in striving to operate at a minimum per unit cost a purchasing cooperative should select the output level *OM*. Should the initial price charged by the cooperative be OP_1, the surplus to be refunded to the member entrepreneurs would be $OP_1 - OP_2$, the ultimate price paid by the member thus being only OP_2.

If it is considered that the expansion of the output level of a cooperative is possible only through an increase of its membership and if the return function is of the nature as was assumed above, the level of output at the minimum cost could be regarded optimum for a purchasing cooperative. When this level has been reached, the enrolment of every new member would result in a higher purchasing price than previously for the supplies because of the increased operating cost of the cooperative.

In Figure 5, however, the curve *RP* has been determined for the express purpose of making clear the conditions—or rather all the limitations—which bring about the situation where a purchasing cooperative operates at equilibrium at its cost minimum. It is to be taken into consideration, however, that the factors contributing to the shape of the *RP* curve, examples of which were the type of soil and distance from the purchasing center, are not of a nature to be included on the return side but actually are cost items. In production, when a given crop quantity is the goal, poor soil has the effect that more fertilizers, more work, etc. will be required than in cultivating good soil; thus it is a cost factor. The distance from the purchasing center is also a definite cost item in the form of transportation costs.

The assumption frequently made that the activity of a purchasing cooperative is always conducted with the aim of minimizing its average operation costs is, however, a very short-sighted standpoint. It should be remembered that the amount of commodities bought through the cooperative depends on other factors besides the operational costs of the cooperative. The optimum level of output of a purchasing cooperative is not necessarily the one where average operation costs are minimized. It is important to note that formation of the value to the members of the supplies bought takes place under the same economic

laws as the formation of the value (price) of commodities sold through a marketing cooperative.

A simplified example will clarify the matter. Let us suppose that plant growers have set up a cooperative to buy fertilizers for their plants. We will further suppose that the growers can increase the amount of plants if, for some reason, they want to buy more fertilizers. Thus an increase in the output of the cooperative means more fertilizers and more plants. The average productive value of the fertilizers to the grower appears now in the average farm price of the plants. Suppose now that the fertilizer-purchasing cooperative is trying to minimize its operation costs by expanding its business. Since the amount of production rises with the increase in the use of fertilizers, the average farm price of plants tends to fall at the same time as a result of the business expansion. The reason for a considerable price fall might be, for instance, a rather low elasticity of demand for plants. In addition to this possible development in farm prices every grower has to take into consideration the development in all costs of plant production before he is able to make a final decision concerning the optimum level of output of his cooperative. Now it is quite clear that the plant growers do not want their cooperative to operate necessarily at the level of output where the operation costs are minimized. In final decisions concerning the operation policies of the purchasing cooperative all cost and income factors have to be taken into account.

There is still reason in this connection to briefly call attention to the theoretical argumentation used by CLARK (1952) in striving to prove the correctness of this common misconcept of the optimum of output level. He desires to compare the operation practices of an enterprise with those of a cooperative and presents therefore the usual demand curve of the supply item instead of the return curve *RP* used above.

In accordance with the theory of the firm, CLARK states that the maximum profit is attainable at output level *OS* in Figure 6. *OS* is determined customarily by the point of intersection of the marginal cost and the marginal return curves. If we now take curve *AR* as the indicator of the members' demand for the supply item, it is always necessary for determination of the quantity of the supply item sold to know the ultimate price paid by the member, a fact which CLARK consciously disregards. For example, at output level *OR*, the ultimate price to be charged from the member is $RQ - MQ = RM$.

The demand curve *AR* now indicates that when the ultimate price is *RM*, the members will desire to purchase such a quantity of the

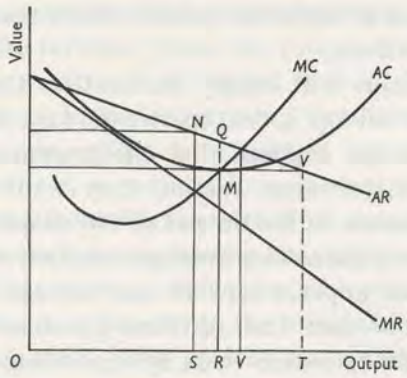

Fig. 6.

supply item that the cooperative should expand its output level to *OT*, i.e. considerably beyond the level indicated by the minimum of cost. It appears, in fact, that when this method of examination is employed, the nucleus of this problem—the formation of the demand for the services of the cooperative by the members—will remain so indefinite that no accurate opinion can be formed on this basis as regards the optimum output level of the cooperative.

In determining the demand for the supply item we cannot disregard, firstly, the changes in cost to the members that arise when varying quantities of the item are used as input in their firms and, secondly, the changes in return obtained when varying quantities of input are used. Now it must be taken into consideration that the formation of return obtained by utilization of the supply items (input units) procured through the purchasing cooperative or, in other words, the formation of the average return of price obtained from the output of the members always takes place under the same economic laws as the formation of the value of the products marketed through a marketing cooperative. In the case of a marketing cooperative the unit profit or unit loss to the member is determined by subtracting the average operating cost of the cooperative and the average production cost of the member from the average return or selling price of the cooperative. In a purchasing cooperative the member's profit or loss is obtained by subtracting the average production cost of the member and the average operating cost of the cooperative from the average return obtained by the members from the output produced per unit of input. If, therefore, we consider that the average return of the marketing cooperative, i.e. the selling price, corresponds to the average return of

the member of a purchasing cooperative obtained from the output produced per unit of input, the interpretation of the principles of operation of both forms of cooperatives can be carried out by the same methods.

The situation shown in Figure 4 may now be applied also to a purchasing cooperative. Curve AC_1 should then be considered as indicating the costs of production in the member firms and curve AC_0 from curve AC_1 upwards as designating the average operating costs of the purchasing cooperative as a function of the output level. AR would then represent the average return to the members obtained when various quantities of the supply item or input are used. On the same grounds as in the case of the marketing cooperative the optimum output level may be said to lie at OM, where the difference between the average return to the members and the average cost of the corresponding business and production activities attains maximum.

Although it was shown above that an effort to operate at the extent presupposed by the minimum cost cannot be accepted as the general principle to be followed by purchasing cooperatives, there may in practice occur situations in which this principle is appropriate. If the return of the members remains dependent solely on the internal conditions of the member firm, while the formation of the market value of the product thus produced is independent of the extent of output of the cooperative, the minimum cost offers its members economically the most advantageous conditions. The return curve AR would then be a horizontal line, in other words, the elasticity of the demand for the product produced would be infinite.

We can now note that the situation presented in Figure 5 and the example given respectively on pages 37 and 38 are only representative of a special case in the general operating principle of cooperatives. It should further be taken into consideration that an exactly corresponding situation may occur in the case of a marketing cooperative. The curve RP would then indicate the price of the outputs sold under conditions of infinite elasticity of demand, after subtraction of the production cost of the member firms.

On the basis of the foregoing treatment of the question, the final discussion of which will be given in connection with the study of the nature of cooperative integration presented later, the optimum output level of cooperatives may, as a corollary of the general principle of operation, be interpreted as follows:

(1) The optimum output level of a purchasing cooperative will be attained when the average return obtained by the members from the

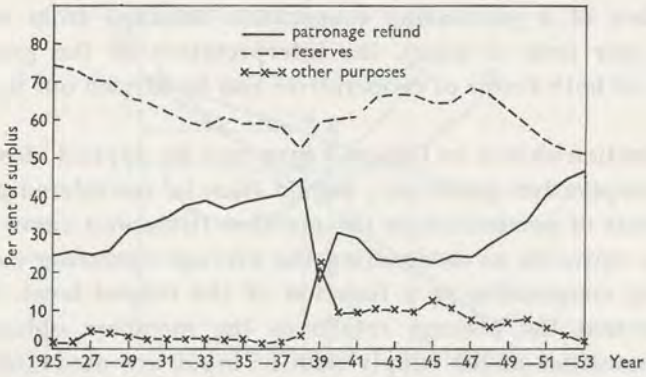

Fig. 7. Division of surplus of the SOK member cooperative stores in patronage refund, reserves and other purposes in 1925–53.

output produced per unit of the input supplied by the cooperative after subtraction of the corresponding operation cost of the cooperative reaches its maximum.

(2) The optimum output level of a marketing cooperative will be attained when the difference between the average return or price per unit of the product marketed and the corresponding operation cost of the cooperative reaches its maximum.

(3) When the average return from output produced per unit of input procured by a purchasing cooperative, or the average price per unit of the product marketed by a marketing cooperative is constant, the optimum output level may, in addition to the general rules given in paragraphs 1 and 2, be determined as attainable at the level of the minimum operating cost of the cooperative.

In examining the effects of the principle followed in distribution of surpluses on the operation of the cooperatives, attention should also be paid to certain practical aspects. It is to be noted, in the first place, that the surpluses of the cooperatives distributed to the members as patronage dividends, in many cases seem to be rather insignificant. As an example, Figure 7 reviews the use of the surplus of SOK (Central Society of Cooperative Stores in Finland) member cooperative stores in the period 1925–1953. The corresponding numerical data are shown in Appendix 1.

It is interesting to note that each year during the whole period the amount distributed to members has been less than 50 per cent of the total surplus so that the total of patronage refunds has never been more than 2.6 per cent of the business turnover and was, for example,

in 1953 only 0.4 per cent of the same. It might be asked now: Does not the fact that only such small amounts are distributed to the members make the reasoning about the optimum output level of the cooperative as presented above less meaningful? In order to find an answer to this question a short reference to the nature of the patronage dividends is necessary.

When a member of a marketing cooperative delivers his product to the cooperative the price received for it is dependent on the operation or marketing costs of the cooperative and the price of the product on the market. In practice, however, it is impossible to calculate in advance the exact marketing costs per unit of the product and consequently the costs are usually estimated on the basis of previous experiences. It is often more advantageous technically and from the standpoint of managerial policies to overestimate the marketing costs and pay a rather low initial price to the members. For this reason the cooperators, as EMELIANOFF (1948, p. 133) remarks, "usually prefer in their practice to *overestimate* their potential costs and follow the unwritten rule of reasonably excessive deductions from their value of transactions with the understanding that the surpluses will certainly be distributed to them at the end of the business year". Similarly there might be, for technical reasons, a tendency to underestimate the price that the cooperative is going to get for the product on the market.

Patronage dividends then are actually inherent because of the tendency to underestimate the cooperative's average return and to overestimate its operation costs. It is not to be expected that the cooperatives should strive to maximize the per unit dividend as such, but only to be able to maximize the average return to the members, which in marketing cooperatives is the initial price paid plus the per unit patronage dividend. Consequently, the amount of dividends paid per unit does not affect the significance of what has been said above about the optimum output level of the cooperatives. This is all the more important to note, since in practice many cooperatives, in order to avoid certain difficulties in taxation, concentrate their efforts to make the initial price (or initial charge in purchasing cooperatives) as exact as possible, which practice naturally tends to diminish the amount of dividends payable.

2.3.2. *Non-independence*

The second task, in portraying the essential characteristics of cooperatives, is to describe the nature of their economic non-independ-

ence, a matter already briefly touched upon in connection with the classification of firms. The significance of this matter is enhanced by the fact that such differences of opinion as appear in earlier theoretical studies of cooperatives have been, for the most part, differences relating expressly to the question of whether a cooperative is independent or non-independent. Now it should be noted, before taking up the actual problem, that of two different opinions neither has necessarily to be actually erroneous, if the basis for the analysis is not exactly the same. There is reason, in this connection, once more to recall the various possibilities of definition which have been given in the preceding. By requiring realism, the definition of a cooperative in a given country can be based on the general cooperative practice therein, and in that case it can just as well be concluded that cooperatives are independent as the reverse. Perhaps it can even be contended that a great number of Finnish people, for example on the basis of their practical experience, might regard a cooperative as "just another enterprise". In setting forth this, as well as other matters, in our search for solutions, it is therefore important to bear constantly in mind the definitions given previously.

As criterion of the non-independence of a cooperative must be considered its attitude toward profits, in the manner previously stated, since the most important economic indication of an independent firm or enterprise is its striving for profit maximization. As the purpose of a cooperative is the advancement of the interests of its members, we now come to question whether these strivings conflict with each other. SUKSELAINEN (1938), in stressing the matter of independence of cooperatives, considers it natural that cooperatives strive to confer as great benefits on their members as possible, in the same way as all other profit-making firms. His logic, which can perhaps be regarded as representing those students of cooperation who regard cooperatives as enterprises, is, briefly, as follows: If a cooperative distributes the surpluses accumulated to its members in proportion to patronage, the business activity can freely be expanded to the stage where profit will reach its maximum, because this profit will ultimately be distributed among the members and in purchasing cooperatives will thus come to signify a reduction in the price of the supply item to the member, and in marketing cooperatives an increase in the price that the member receives for his product.

The kernel of the question is, do the maximum profits of the members and of the cooperative coincide, are they obtained at the same output level and in general under similar conditions? That this is not

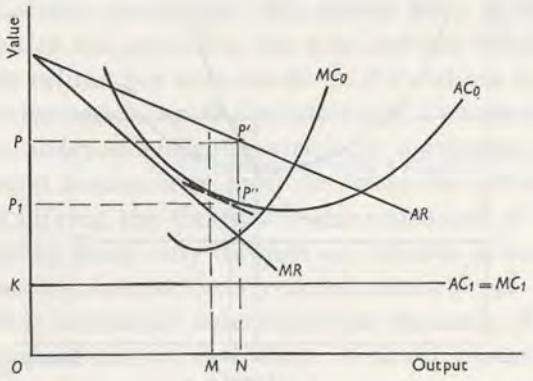

Fig. 8.

the case can be shown very clearly by practical examples and by theoretical evidence.

The non-independence of a cooperative appears clearly in examining the nature of its return and cost functions. In principle, the purchasing price paid to a member firm cannot be regarded as an independent cost factor of a marketing cooperative although it might in practice, for book-keeping purposes, be entered as an expense item. Respectively the price paid for a supply item by the member cannot be regarded as an independent return factor of a purchasing cooperative. In the case of independent firms, on the other hand, the corresponding purchasing price is one of the most important cost items and the selling price makes up the independent return of the enterprise. This difference in attitude arises from the integrated nature of a cooperative, or, as LIEFMANN (1921) among the earlier investigators has pointed out, from the fact that a cooperative does not constitute an economic unit by itself but together with its member economies.

Figure 8 represents a marketing cooperative in the same conditions as Figure 3. The *AR* curve indicates the average return or price of the product and the *MR* curve the corresponding marginal return. If we regard the production costs of the member firms as constant, the average production costs equal the marginal costs $AC_1 = MC_1$. Marginal costs corresponding to AC_0 are indicated by curve MC_0. The optimum output level for the members of a marketing cooperative is thus achieved under these conditions, as previously mentioned, at the level where the difference between average return and average cost reaches its maximum.

If, on the other hand, the cooperative would behave similarly to an enterprise, the best output level for it would be *ON*. At that output

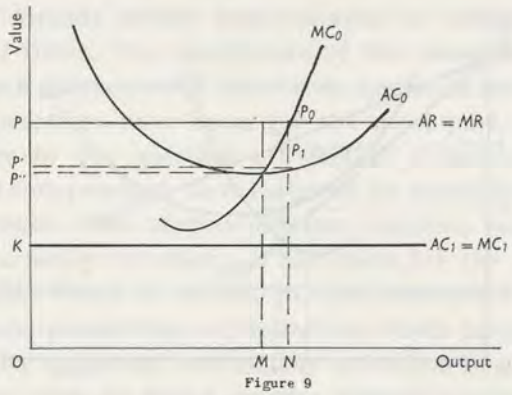

Figure 9

Fig. 9.

level the total profit would attain maximum value $PP_1P''P'$, the marginal return and cost being equal, $MC_0 = MR$. If now the maximum profit obtained were distributed to the members as dividends, the refund per unit would be $P''P'$ and the unit price ultimately paid to the member OK plus $P''P'$. At both OM and ON output levels the initial price paid to the members would be the same OK. However, since the average refund per unit at output level OM is greater than at output level ON,[1] the former level is in the interest of the members. In other words, the output levels of maximum total profit and maximum average profit per unit do not coincide. Thus it can be ascertained that the advantage of the members does not permit a cooperative to operate on the principle of achieving the greatest possible total profit. (Cf. CLARK 1952.)

On the part of purchasing cooperatives we can naturally indicate to an exactly corresponding non-independence. In order to show that the question under consideration is not affected by the slope of the return curve, it is assumed that the return to the members obtained from the utilization of the supply item is constant at all output levels of the cooperative; AR equals MR in Figure 9.

As the average return to the members is constant, the optimum of the cooperative (OM in Figure 9) is attained at that level of output where AC_0 achieves minimum. If the cooperative would charge its members the initial price KP, $P''P$ might be distributed as surplus refund per unit. If the cooperative, on the other hand, would behave similarly to an enterprise, it would expand its operations to ON where

[1] The OM output level has expressly been determined on the basis of the maximum vertical distance of curves AR and AC_0.

the total profit attains maximum (MC_0 equals MR). If this total profit were distributed to the members, the total refund would be $P'P\,P_0P_1$ and the average refund per unit would be $P'P$, which is smaller than $P''P$. A cooperative which serves the interest of its members can therefore not operate independently, i.e. strive for maximum total profit.

There is special reason once more to stress the point that for the purpose of simplifying the treatment, the expansion of a cooperative is deemed as taking place only through an increase in membership. Of course each member, as previously noted, can change the output of his firm, which is ultimately determined on the basis of the marginal return and marginal cost in each firm. A closer examination of this generalization can, however, be left to be taken up in connection with the discussion about the nature of cooperative form of integration, since it does not affect the problem of non-independence of cooperatives here studied.

The non-independence of a cooperative in its striving for profits appears also from the price policy pursued by it. A more detailed examination of the problem can perhaps most simply be performed in the light of an example close to practice and only slightly simplified. Let us think that a cooperative slaughter-house markets pork which it has purchased from its members, partly processed to sausages, but mostly as meat. Let us further assume that, because of the keen competition on the market no profits can be attained in the marketing of unprocessed meat, whereas sausage manufacture fetches some profit. If the supply of pork would increase the producer price as well as the retail price of unprocessed meat would decline and the meat marketing would go on without profits as previously. In the manufacture of sausages, on the other hand, the reduction in the price of the raw material would mean higher profits for the slaughter-house. It would thus be to the interest of an enterprise operating under these same conditions to strive to effect an increase in supply of pork for example by effecting imports from abroad. The attitude taken by a cooperative (which seeks to benefit its members) toward imports is different. The general price fall of meat caused by the increased supply would mean great losses to the member producers. These losses could not be compensated by the small surplus refunds which the cooperative, with the help of profits obtained from the manufacture of sausages, would be able to pay its member producers. Thus it would not be in the interest of the cooperative to seek to effect pork imports, and the action of the cooperative in order to fulfill its purpose would differ from that of an enterprise.

Thus in this regard also the differences in the return and cost functions of a cooperative and an enterprise are the ultimate reasons for the pursuit of different methods in similar circumstances. An enterprise strives with all means to maximize profits, but a cooperative must always in the first place take notice of the effect of each action on the economic results to its members.

Since it has been noted above that operations consistently pursuing the maximizing of profits are not consonant with the interests of the members of a cooperative, it will be interesting to examine under what kind of practical circumstances active cooperatives can adopt such a goal. When does a cooperative forego its actual proper economic position as a transactor of business for its members in the most advantageous manner? Quite obviously, this question is connected with the method of distributing the profits which have come into the possession of the cooperative. In so far as a part of the profit remains in the permanent possession of the cooperative, the interest of the firm may very easily be centered on making this part as great as possible. On the relation of the part of the profit to be refunded and the part remaining in the possession of the cooperative will depend to what extent the cooperative follows the behavior of an independent firm.

In practice, the refund is generally paid as a specified percentage of the business turnover between the cooperative and the member. If the cooperative desires to retain a part of the profits which have come into its possession in order to apply it in some way to augmenting its property, independent return and cost functions will be formed for the cooperative and decisions relating to operations will be made on the basis of these. Let us now think, for example, of a marketing cooperative in such a situation. In Figure 10 AR indicates, as previously, the price obtained for the marketable product as a function of the level of output and the curve AR_1 slopes at a distance $P'P''$ from AR determined by a constant per unit refund.

According to what has been presented previously, the optimum output level of the cooperative, OM, would be where the vertical difference between the AR and AC_0 curves would be at its maximum. If now the cooperative refunds to its members only such a constant amount per unit as is indicated by $P'P''$, it does not have any immediate effect on the profit of the member firms what the output level of the cooperative is, as long as it is greater than OK and less than OS. Outside these extreme values the cooperative cannot, without losses, make a surplus refund as great as indicated by $P'P''$. When the cooperative can determine its output within these limits, it can attain the highest

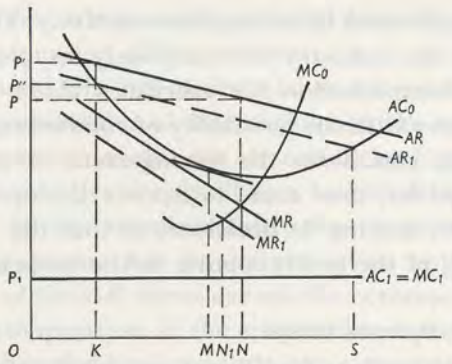

Fig. 10.

total profit at output level ON_1, when the marginal return determined by AR_1 is equal to the marginal cost ($MR_1 = MC_0$).

It may further be noted from Figure 10 that not even in this case the optimum output level of a cooperative is the same as that of an independent firm in a corresponding situation. The entrepreneur would pay the OP_1 price to the producers and would maximize his profit at the level ON ($MR = MC_0$). The various output levels would thus have the following ratios: $OM < ON_1 < ON$. To what extent a cooperative, in determining its output level and in deciding upon other problems connected with its activities, follows methods peculiar to independent firms, remains dependent on the relation that the refund paid to members bears to the whole surplus.

There is special reason, finally, to stress the fact that by profits we do not here mean solely the surplus indicated by the closing of books. The greater part of surplus coming into the possession of a cooperative may be used in different ways for augmenting the property of the cooperative. An independent pursuit for profit maximization as such cannot very easily develop in a cooperative because of the structure of its ownership, but under certain circumstances the activity of a cooperative may become an end in itself, so that its goal will become a continued expansion and strengthening of the firm. The fruition of such a program may be influenced by the attitude of the management and its relations with the members, the internal structure of the membership and the way in which the matter of ownership has been arranged. These factors, which in some circumstances may lead cooperatives to act contrary to the principles mentioned afore, will be treated in more detail in the following chapters. There is, further, reason to note that certain macroeconomic considerations may well

be convoked in vindication of an expansive activity. Thus, for example, the gathering of the industry as completely as possible under one control may, as compensation for sacrifices made in this instance, provide the members with the possibility of conducting a stronger price policy. Under such conditions the management of a cooperative, for reasons of price policy, may come to deviate the operation principles delineated above in making its decisions, so that the first interest will be the maximizing of the profit coming to the cooperative.

2.3.3. *Membership, Open or Closed*

The postulate adopted in traditional cooperative doctrine in regard to membership is generally expressed as the principle of the open door, a principle to which the founders of the cooperative movement were drawn by their adherence to democratic ways and desire for social reform. For during the early stages of the cooperative movement it was extremely difficult for the members of the lower classes in the community to gain any advantages from business activity conducted on a large scale and it was accordingly the intention to give cooperatives a form of an organization which anyone could join. Viewing the matter against the historical back-ground, the policy of the open door must be taken as specifically signifying an attempt to abolish all social discrimination in regard to membership (cf. HOLYOAKE 1908).

In an economic sense, on the other hand, the said principle cannot be broadened to mean that a cooperative does not limit the number of its members at all. An increase in membership, of course, will not lead to confliction with economic behavior as long as the expansion of activities brings with it an amplitude of possibilities for lowering average costs of the cooperative without unfavourable developments in return at the same time. Students of cooperation have nevertheless long been aware of the fact that too wide an application of the open door principle would violate the laws of thrift. Thus SUKSELAINEN (1938, p. 11), leaning on older literature[1] for support, observes that "the principle of open membership is not consonant with a cooperative defined as an economic unit, because a consistent application of the principle might very easily lead to violations of the principles of economics. A cooperative, like any other economic unit, is subject to the laws of increasing and diminishing productivity."[2] We can agree with this statement, notwithstanding that the reference to the laws of

[1] Of these may be mentioned especially LIEFMANN (1922), CASSEL (1923) and FUCHS (1928).

[2] Original Finnish.

productivity, in other words to the physical laws of production, is not an exhaustive explanation of the matter.

We can perhaps obtain the clearest basis for examining the matter by studying the possibilities of fluctuations in the membership of cooperatives in a situation such as is described by Figure 10. Referring to what has been said previously, it can be noted that very considerable fluctuations in the memberhship of a cooperative are possible without incurring losses. All the output levels within the range of which the values of the AR curve exceed the corresponding AC_0 values may here come into question. If the cooperative would pay the amount of $P'P''$ as patronage dividend per unit, the output area without losses would be reduced to levels between OS and OK. But it must here be noted that so wide a fluctuation is not possible without violating the striving for *optimum* results. In order to attain the optimum, the output level of the cooperative must be set at OM which thus imposes a limit to an increase in the membership. In economic sense, the open membership principle cannot be thought of as applicable without limits; it must rather be thought of as belonging to the social doctrines of the cooperative movement. As an interesting sidelight in this connection it may be mentioned that in many instances the optimum of activity of a cooperative is achieved with even a smaller number of members than what is the case with a corresponding independent enterprise. Closer examination of this matter, however, must be deferred to be taken up in connection with a study of the nature of the cooperative integration.

If it is desired to confute the aforestated opinion, which appears rather positive, in stressing the strict limitations in cooperatives' membership, it can of course be pointed out that in practice cooperatives do not aspire to limit the number of their members but on the contrary use every means at their disposal to secure new ones. To obviate such differences of opinion arising from misconceptions the attention in matters relating to membership must here be focussed on four aspects.

It must firstly be noted that observable expansion tendencies are primarily to be considered in the nature of proof that the optimum output level of the cooperatives has not yet been generally reached. A phenomenon corresponding to such tendencies for increasing membership is also observable in the sphere of enterprise where it indicates considerable possibilities for rationalization and reduction of costs.

Secondly, the strong opinion adopted above, with regard to the

Table 1.

Average costs in certain butter-making dairies per 100 kilograms of milk received, calculated for dairies in various size categories in 1952 and 1953

Size category	Millions of kilograms of milk received	Number of dairies		Average costs in marks per 100 kilograms of milk	
		1952	1953	1952	1953
I	–0.5	5	3	318.3	352.8
II	0.5–0.9	40	28	218.9	280.8
III	1.0–1.9	58	53	274.6	277.7
IV	2.0–2.9	41	40	274.3	283.3
V	3.0–3.9	24	32	272.4	283.0
VI	4.0–5.9	22	27	276.0	252.8
VII	6.0–	6	6	324.0	312.7

matter of increasing membership, arises from the static method of study used which has led to a consideration solely of the fluctuations inside the limits of existing capacity. The optimum output level of a cooperative determined under these conditions naturally does not provide for the same elasticity in operations as the dynamic reality. In practice, of course, the possibility for changes of the size of the plant is always open to a cooperative. If during the prevalence of the optimum utilization of the cooperative's capacity there appear new prospective members, the normal practical consequence is that the capacity is increased. In that way the "un-cooperational" feature represented by a limitation of membership is avoided.

To shed further light on the matter at hand we shall in the following examine the cost developments in certain cooperative dairies as an example. According to unpublished calculations made by the Central Federation of the Cooperative Dairies Valio, the average costs in butter-making dairies[1] in various size categories were during the years 1952 and 1953 as shown in Table 1.

What conclusions can be drawn from these statistics as to the possibilities of butter-making dairies for increasing their membership (or the amount of milk received)? In the table, the dairies are divided into seven size classes according to the quantity of milk received. Obviously the capacity for handling milk of the dairies in various

[1] A dairy is considered a butter-making dairy when 80 per cent or more of the milk or cream received by it is made into butter.

size classes increases from I to VII. The size class division can thus in a certain sense be regarded as division by capacity. The dairies in each class have their own average capacity within which the changes of output may take place. On the basis of the table it can be said that only one point of the cost curve peculiar to each capacity group is known. Now if it were certain that this point is at the minimum of each cost curve, it could approximately be determined how profitable an increase in capacity has generally been. But as this condition cannot be said to be fulfilled, the validity of the proof of the statistical material presented is appreciably diminished. It can nevertheless be concluded, with some degree of probability, from the figures in the table that through an increase in the capacity a butter-making dairy may have possibilities for increasing its membership very considerably, perhaps as far as to class V or VI without cost developments turning in an unfavourable direction.

After the average level of size class V has been reached it is impossible on the basis of the figures presented to form any certain conclusions as to the economic possibilities of taking new members. For the six dairies in the last category may well be furnished with the same capacities as the dairies in the preceding category, but their activity has, perhaps, for some reason been extended beyond the cost minimum. Such a reason may be, for example, that the increased membership is not yet sufficient for augmenting the capacity, which always takes place more or less by stages. On the other hand, it is quite possible that the dairies in the last class have been built for handling considerably greater quantities of milk than the 7.5 million kilograms which is now the average for the group. If it would be possible to increase further the membership in these dairies, it might perhaps be possible in that way to reduce the average cost. And yet, even if the average cost of the dairies in the last class is somewhat higher than in classes V and VI, higher average return received for the products might counterbalance the slight increase in costs and make it the interest of the members to increase the size of their plant. It is to be noted, however, that without changes in capacity, which is to say in a static sense, an increase in membership to the extent shown beneficial by the foregoing figures, cannot in any case be considered possible without exceeding the optimum output level.

It must once more be especially emphasized that no attempt is made in the present study to make an exact analysis of costs in butter-making dairies. It is only desired to point out what factors must be taken into consideration in solving membership problem and how thorough

an investigation is required for obtaining guiding principles in each case. Factors having an influence on the costs in dairies are of an individual nature, so that the imparting of any general advice is extremely difficult, if not altogether impossible. The material presented is to be considered only as an indication suggesting that in cooperatives it is in many instances possible in practice to avert conflict between the very strict rules presented in static theory and cooperative ideology by fluctuations in the capacity.

In earlier writings on questions relating to membership of cooperatives there have appeared certain differences of opinion, on which some additional light can be shed after an exposition of the mutual relationships between the factors described above. These differences of opinion are very typically reflected in the exchange of ideas between CLARK (1952 a and b) and AIZSILNIEKS (1952 a and b). The analysis made by the former, a part of which has already been touched upon, is clearly static in its nature, although the author does not seem to consider all the consequences thereof. For this reason, in treating the question of membership, he comes to very strong conclusions, holding it essential for cooperative activity even to cut down the membership in certain situations. The opponent appeals quite simply to the fact that a cooperative must distribute precisely the quantity of products or supplies which the members desire, although the activity of the cooperative for this reason would expand beyond the optimum output level. In this discussion the static and dynamic aspects are not distinguished and the conflict between these two workers remains unsolved. On the basis of the above-mentioned systematization we can here note that it may occur in practice that a cooperative may temporarily operate more extensively than its optimum level of output presupposes, but such a temporary stage cannot be regarded as an equilibrium situation. A cooperative aspires to a balanced stage primarily by increasing capacity and not by limiting membership. Only after optimum utilization of optimum capacity has been achieved, is it proper for a cooperative, for economic reasons, to take action to limit the number of its members.

Thirdly, there might appear certain macroeconomic factors, which in some cases restrain efforts to limit the membership even though it would seem necessary from the viewpoint of a single cooperative. Although it could clearly be shown by economic calculations that an increase in membership would be disadvantageous, it might nevertheless be necessary to bring about such an increase in the case that the alternative would be disadvantageous from the viewpoint of the

policy goal set for the cooperative industry. Inasmuch as an exposition of the macroeconomic factors does not fall within the scope of this treatise, there is no reason to take up a detailed examination of the question in this connection. It has nevertheless been deemed possible, by means of a little example, to shed such an amount of additional light on the subject as is necessary from the point of view of the membership problem under examination.

As an example of a case where micro- and macroeconomic aspects have come into conflict, we may examine a problem taken from the sphere of Finnish dairy cooperatives. In its main outline the situation is as follows: In a production region operates a large scale dairy plant which, partly because of its efficient operation, is able to pay high prices for the members' products. In its proximity there operate dairies of noticeably smaller size also owned by producers but their payment capacity is much smaller than that of the large one; weaker to such an extent, indeed, that a continuance of their operation has become questionable. A firm representing other economic interests, however, is desirous of amalgamating these dairies, together with their members. In such a situation two choices are open to the large dairy. In so far as it amalgamates the smaller dairies, together with their members, the inevitable result will be a reduction in its payment capacity, which would spell losses to the original members of the large cooperative. The other alternative, close adherence to the microeconomic optimum may, on the other hand, lead to losses through a weakening of its position on the whole market. In circumstances of this kind it may be necessary to make solutions which are in conflict with principles presented above.

Finally, the limitations set on the basis of the economic interests of the members of the cooperative must be taken into consideration as factors restricting the general validity of the principle of open membership. For example, according to the cooperative law in force in Finland it is possible to frame the rules of a cooperative in such a way that representatives of opposing economic interest can be refused membership. A close examination of this matter, however, will be made subsequently in the chapter dealing with the homogeneity of membership.

2.3.4. *Capital*

The condition precedent for successful operation of any firm, whether independent or non-independent, is adequate business capital.

Since by virtue of the basic character of cooperation, costs must in general be divided among the members in the same proportion as they make use of their cooperative, there should logically be no deviation from this practice in paying for the business capital used by the cooperative. Thus ROBOTKA (1948) in his theory of cooperation, in illustrating the capital requirements of cooperatives with the help of an example notes that the simplest way of financing marketing undertaken cooperatively by producers is that each participant provides his own share of the capital by advancing funds for the operation expenses and waits for the proceeds to arrive. This is the basic form of financing where no unit of funded capital has emerged. But if the number of participants increases and the marketing process becomes continuous, it will be found desirable to provide capital to finance a certain inventory of supplies needed in the operation and to form, for achieving of this purpose, a special fund furnished by the participants. The condition precedent for the efficient management of the capital will then be that the participants surrender individual control over their contributions to it and are willing to submit questions regarding its use to group decisions. The administrative rights and the risk bearing will, of course, remain with the cooperators, notwithstanding that a known body of representatives and, beyond them, a body of actual managers, is elected to exercise executive powers.

In the simplest cases, therefore, it can be concluded that the cost of employing necessary capital for the business is divided in proportion with the transactions between each member and the cooperative. However, in actual practice it is difficult to specify the share of each participating member and thus to determine the financial requirements set for each member in satisfying the total need of capital of the cooperative. Since the business transactions of members with their cooperative are varying in the course of time, it would be necessary, if a just diffusion of costs were to be established, constantly to alter each member's advances. Moreover, this method of financing would be dissatisfactory since the procurement of the necessary capital may in many instances be accompanied by great difficulties for the cooperators. For these practical reasons the formation of business capital has become the necessary resort in financing the operation of cooperatives.

Obviously, the nature of the capital used for financing purposes need not change when pooled into funds. Pooling may merely be regarded as aiming at a flexible management of practical tasks without the capital of the cooperative assuming a status different from that

which it has in the simple case described above. In a way, capital is fully comparable with other means of production. The right to use it, which is necessary for the activity of the cooperative, causes certain costs for which the cooperative is responsible as well as for other expenses. In respect to the nature of capital of cooperatives it must accordingly be noted: (1) that the capital of a cooperative is not an independent income source; and (2) that the capital does not represent power of decision.

It can, naturally, be pointed out that in practice cooperatives cannot obtain rights to use the capital without paying for it and that the price paid for these rights, in other words, the interest, constitutes an independent income to the owner of the capital. But it is a peculiarity of the interest on capital paid by a cooperative that it may not depend on the financial results of the cooperative's activity, as in the case with ordinary entreprenurial capital, but is a pure cost item. It cannot be considered that there were a deviation from this general rule even though in certain instances interest is paid to a member of the cooperative and at times to an owner of capital outside the cooperative. If each member would invest precisely that amount in the cooperative which corresponds to his own share of the capital requirement, it would be unnecessary to pay interest on the capital provided by members, since the expenses for the use of capital would then be justly distributed. But since the maintenance of exact proportions would in practice cause insurmountable difficulties, the payment of interest on capital invested by the members must be considered as a happy means of removing disproportions incurred. In this case the operation cost of the cooperative increases with the amount of the interest and in so far as a member has invested too little in relation to his business transactions, the return he receives from the cooperative will be reduced by the amount of the corresponding interest expenditure. Therefore, as especially EMELIANOFF (1948) and ROBOTKA (1947) stress, the interest paid by a cooperative for capital is not to be regarded as distributive share of profit but as a compensation to such members as have invested in the cooperative capital in excess of what their proportionate share in the business of the cooperative presupposes and who have thus loaned funds to such members as have contributed less than their share should, on the basis of proportions in business transactions, presuppose.

In this connection it is interesting to note that in the foregoing we have apparently come rather close to the opinion earlier held and represented in particular by JACOB (1913), namely that in an enterprise

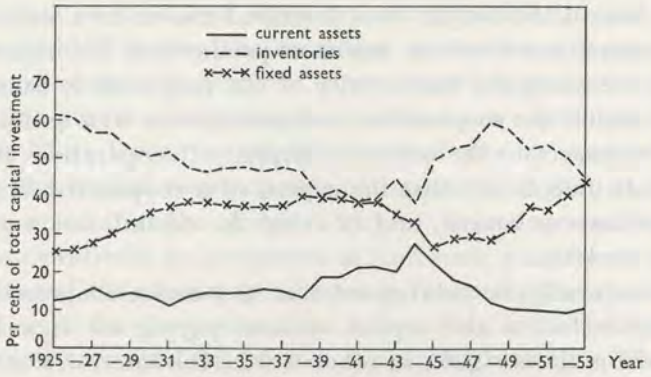

Fig. 11. The relative significance of fixed assets, inventories and current assets in the total capital of the SOK member cooperative stores in 1925–53.

capital governs but in a cooperative it serves. However, in his conception of cooperation, capital has, with reference to theory, a function deviating considerably from that which is here presented. He regards the position of capital as a central feature in the nature of cooperatives and not as a corollary arising from the general economic goal. But so important a position can scarcely be given to capital. In this connection, there is reason to refer to the opinion of SUKSELAINEN (1933) who, in denying the possibility of capital being the basis for groupings in economic endeavour, points out that not even in all forms of enterprises does capital have the central position ascribed to it by JACOB (1913), among others.

Inasmuch as the function of capital in a cooperative is determined by general operating principles as described above, it will be of special interest to examine how cooperatives in practice procure their capital and to ascertain whether or not the methods of financing exert an influence on the nature of the operations. Here it is important to notice to what extent the different methods used in procuring funds for the cooperatives correspond to the ideal that each member's contribution should be in proportion to his transactions. In examining the significance of the various problems connected with the contribution and ownership of capital, it has been deemed desirable, for the purpose of adhering to realities, to take examples from cooperative practice as we go along. In this sense it will be appropriate to form a general idea of the portions of the total cooperative capital employed for different uses in the business.

The total capital investment might be classified to current assets,

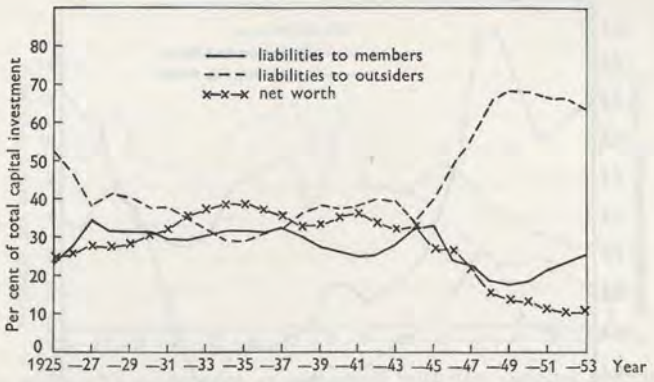

Fig. 12. The relative significance of different sources of capital used in the SOK member cooperative stores in 1925–53.

inventories and fixed assets. Thus the current assets include cash, accounts receivable, notes receivable, accrued income; inventories consist of merchandise and supplies; fixed assets contain investments in land, buildings, furnitures and fixtures. As an example, Figure 11 gives the portioning of the total capital of the SOK member cooperative stores to different uses (Appendix 2). Any comparison based on absolute instead of relative figures in this as well as in later examples would be extremely difficult because of fluctuations in the value of money and of changes in the number of cooperatives.

According to the data presented, the greatest demand for capital contributions in SOK member cooperatives appears to be for inventories. The relative importance of both current and fixed assets seems to have been increasing up to the second world war, but thereafter the significance of current assets has relatively declined. However, it is important to note that fixed assets, even on the basis of the balance sheet figures, represent a considerable proportion of the total capital. This is significant since it seems to be the more difficult to arrange proper methods of dividing the costs of capital contribution among members the less liquid the investment is, as will be seen later.

To set forth the various sources of capital used in the example studied, there are given in Figure 12 (Appendix 3) the percentages which the net worth, liabilities to members and liabilities to outsiders bear to the total capital.

It appears from Figure 12 that at the beginning of the period examined, liabilities to outsiders represented the greatest part of the capital used. From 1925 to 1935, however, the significance of net worth rela-

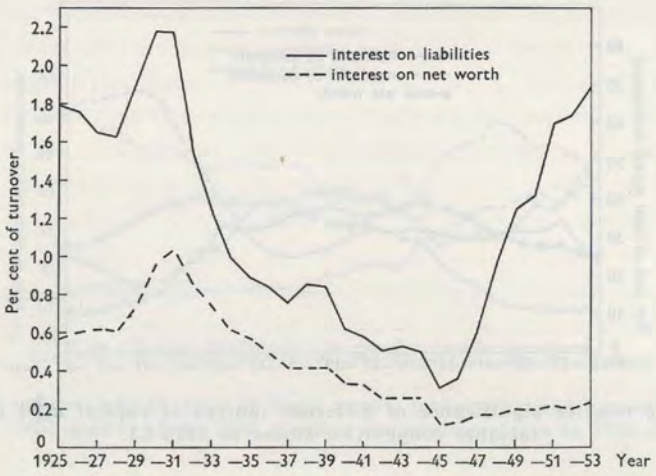

Fig. 13. The relative significance of liabilities and net worth in the total financing cost in the SOK member cooperative stores in 1925–53.

tively increased, representing in 1935 nearly 40 per cent of the total assets. Beginning with the year 1944 there is noticeable a very marked increase in liabilities to outsiders and a significant decline in liabilities to members and in net worth. But it will here serve no purpose to embark upon an analysis of the causes of this development, interesting though it be, as such. Attention must be given, rather, to possibilities

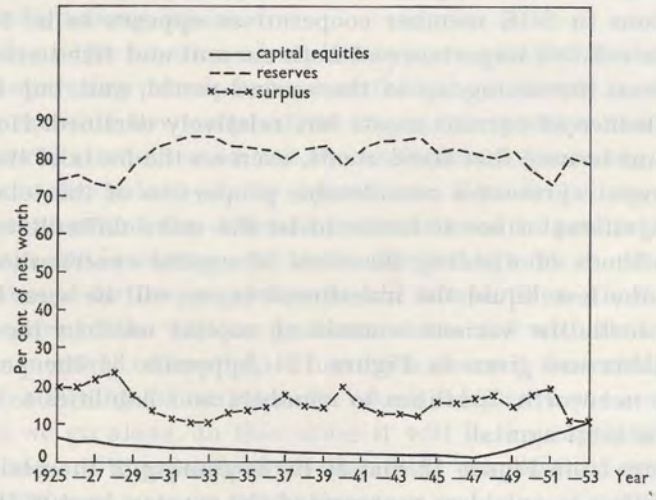

Fig. 14. Division of net worth in the SOK member cooperative stores in capital equities, reserves and surplus.

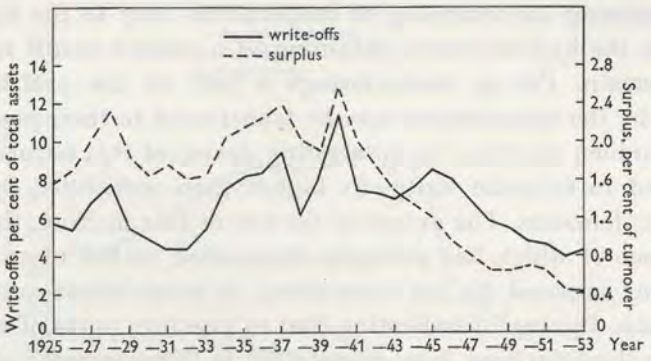

Fig. 15. The write-offs percentage as compared with the surplus percentage in the SOK member cooperative stores in 1925–53.

for disproportionalities in the division of capital contributions. The example under consideration just points to the fact that during a period of time constant changes take place in the proportions of net worth and liabilities. This naturally might multiply the errors in division of capital costs if the method used is inadequate. In this sense, as previously noted, net worth occupies a special position.

The significance of net worth in the total financing cost can be ascertained by calculating for it the same percentage of interest as is paid, on the average, for the liabilities and by comparing, on the one hand, the total interest on liabilities and, on the other hand, the calculated theoretical interest on net worth with the business turnover. This comparison is presented in Figure 13 (Appendix 4).

The disproportionalities occurring in dividing financing costs with reference to net worth are naturally dependent on their structure. For this reason it will not be appropriate to examine the net worth as one unit but rather as dividend, as shown in Figure 14 (Appendix 5), into capital equities, reserves and surplus.

The greatest part of the cooperatives' capital seems to be tied to reserves. The share of the surplus, for which the interest probably should not be calculated on the same bases as for other groups of net worth, has during the period under consideration fluctuated between 10 and 25 per cent. Capital equities have been the least significant, although they have tended to increase during the last few years. It is interesting to note in this example that attempts have in general not been made to achieve a proper division of financing costs, except in the case of the least significant item, that is, in the instance of the capital equities on which interest is paid in many cooperatives.

In examining the financing of cooperatives only in the light of the figures in the balance sheet, obtaining of a correct result is not altogether certain. For in book-closings a part of the profits actually obtained by the cooperatives may be transferred to their possession in form of hidden reserves. An interesting device of this nature has been in Finland to estimate write-offs higher than warranted by just depreciation demands. The extent of the use of this method, the possible significance of which has probably diminished within recent years by restrictions imposed by tax authorities, is nevertheless very difficult to ascertain. By way of indicating that in practice, parts of actual surplus have thus, perhaps, been transferred to the possession of cooperatives, a few series of figures will be examined in the following (Figure 15, Appendix 6).

Since the write-offs in certain periods both before and after the depression of the 1930's appear to have reached an amount of 2–2 ½ times the write-offs now considered as proper for taxation purposes, it seems probable that a part of the annual surplus has thus been transferred to the possession of the cooperatives. This assumption is also partly supported by the fact, easily ascertained from the figure, that write-offs and surpluses have in general fluctuated in the same direction. Of course this similarity is no irrefutable proof. Nevertheless it seems natural that during good years the booked profits are permitted to appear proportionately greater than during bad years, in spite of the fact that it is at such times also desired to transfer a part of the profits in the form of hidden reserves to the possession of the cooperatives.

In this connection it must be stressed that it has not been desired to stamp the above-mentioned practices as characteristic of the SOK member cooperatives or cooperatives in general. It has been desired only to point out that in so far as this method, which is probably general in all firms, is followed in cooperatives, it might cause certain confusion in division of financing costs. If a certain part of surpluses obtained are withheld from the members for the benefit of the cooperative without the members being compensated therefore in any way,[1] the changes occurring in the internal structure of the membership might easily cause disproportions in the division of financing costs.

The member cooperatives of the Central Federation of the Coopera-

[1] Without intending a closer treatment of the corresponding procedure in enterprises a reference might be made to the fact that for example in corporations an increase in net worth at least partly benefits the shareholders in the form of a rise in stocks.

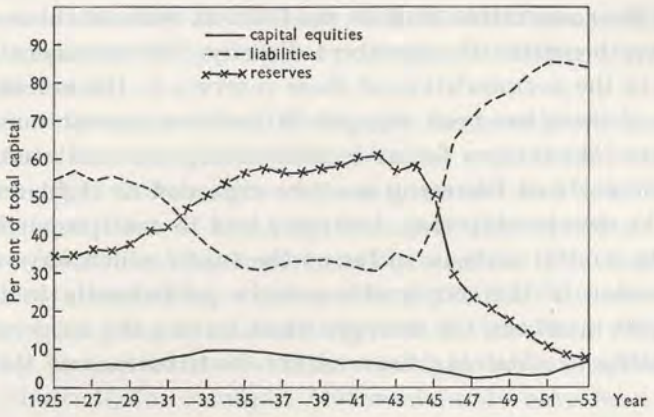

Fig. 16. The relative significance of capital equities, reserves and liabilities in the total capital of the Valio member cooperative dairies in 1925—53.

tive Dairies Valio have been taken as the second example. In Figure 16 (Appendix 7) there is given, in the same way as with regard to the SOK member cooperatives, the relative significance of net worth and liabilities in the total capital of cooperative dairies. Liabilities are here treated as undivided.

The significance of net worth in cooperative dairies seems to have grown considerably during the 1930's. After the war, however, there appears an increase in the use of credit and the amount of liabilities has grown greatly, both absolutely and relatively, although this development has been exaggerated by inflation occurred during this period. In spite of this development, the method by which the net worth of cooperatives is formed and the cost of this formation divided among the contributors is still very important from the viewpoint of appropriate division of the total financing cost. It is interesting to note that the general tendency of modernization of dairy plants after 1945 which has partly increased the use of credit in financing will, perhaps, be followed by a period of time when the significance of liabilities is reduced. As the conribution of capital will then be transferred directly to the membership, the method used in determining each member's proportionate share of the total need of capital and in compensating the disproportionalities occurred seems to have in the case studied a remarkable economic significance.

In general, it is to be indicated that an increase in the net worth always takes place at the expense of the members because, for the accumulation of both tangible and hidden reserves a part of the

return of the cooperative must be used which, without these measures, would have benefited the members directly. The members have participated in the accumulation of these reserves to the extent to which each one of them has been engaged in business transactions with the cooperative. Thus, in so far as conditions remain unaltered, the division of the costs of financing must be regarded as right and proper. Changes in membership may, however, lead to a disproportional division of the capital costs in so far as the funds which have come into the possession of the cooperative remain permanently in its ownership and the members, for example when leaving the cooperative, have no possibility of obtaining their earlier contributions of the business capital.

The significance to the nature of a cooperative, of the various methods of solving financial problems, come to light with clarity in examining the cooperative either in its initial or expanding stage of development. Attention must here be paid to three points. The effect of the methods of financing must be studied with a view to their effect on (1) the division of costs, (2) the goal of the cooperative's operations, and (3) the relations between members and the cooperative.

Let us here think, for example, of the establishment of a certain marketing cooperative. Necessary capital required to start the operation of the cooperative may be obtained partly from the prospective members' contributions and partly by resorting to loans. In so far as members' direct contributions are made, for example, on the basis of a criterion indicating the production capacity of the members (e.g. number of cows for the members of a cooperative dairy) and the cooperative is obliged to return the withdrawing members' investment, the costs arising from the capitalization may be regarded as correctly divided. If it is considered that there will be difficulties in practice in determining each member's contribution, the same result can be attained, as previously stated, by paying a limited interest on the members' capital equities. This interest appears naturally as a cost in the accounts of the cooperative and reduces the price paid for the members' product by a definite sum per unit or adds to the price of the supplies sold to members. The share of each member in the financing costs will thus naturally be in proportion to the members' patronage. There is reason, also, to note that the funds required for interest on the capital equities constitute a cost item quite similar to other interest payments, but since these interest payments are made to members, their price reducing effect is only apparent. Consequently, as long as the business capital consists of solely members' investments and

credit, there do not seem to arise any factors which would clearly tend to cause changes in the operational principles of cooperatives, as previously delineated.

In practice, however, it is difficult for the members to subscribe more than the most urgently needed initial capital and thus there remains a need to increase the net worth on the one hand by extinguishing at least some of the long term debts as rapidly as possible and on the other hand by accumulating reserves. For reduction of long term debts needed for construction of facilities the amortization should then take place in a shorter period of time than what is presupposed by proper write-offs with regard to the utilization of the borrowed funds. If, for example, borrowed funds have been invested in a building for which the period of utilization has been calculated at twenty years and the loan is amortized in five years, there will be a certain change in the structure of the capital. The funds needed for the amortization of the loan must be obtained by retaining a definite sum from the proceeds of sale or by adding a certain charge to the price of the supplies sold. The members thus participate in amortizing the debt in proportion to their business transactions with the cooperative. The same is true with regard to reserve funds. The part of the annual surpluses which has gone into reserves signifies a reduction in the refund to the members.

In so far as there occur no changes in the membership, alterations in the structure of capital cannot be considered to have any effect on the division of the financing cost. A reduction in borrowed capital means reduced interest expenditures and thus, in the future, higher prices to the members.

In this connection it must be stressed, in order to avoid misunderstanding, that attempts to reduce the significance of the use of credit must in general be regarded as in conformity with sound principles of business management. Thus a reduction in the debts of a cooperative cannot in itself lead to conflicts with the cooperative conception presented above, although it will be noted in the following that in certain instances the methods used in striving toward this goal may have certain effects which are to be regarded as contradictory to the general principles.

As it would be very unrealistic to assume that the membership will continuously be unchanged in structure, some further attention must be given to the methods in which the net worth may be increased. It ought to be studied how the rights of ownership of the funds which come into the possession of the cooperative are in fact arranged and

to what extent compensation is paid to the actual owners for the right to use such funds.

In considering the matter of ownership rights, it may perhaps be observed that in accordance with the generally accepted opinion a co-operative is frequently juridically regarded as owned by its members and that hence also all the assets are explained as belonging to the members. To support this opinion, it may be noted that for example at the time of dissolution those who are members are entitled to the residual equities. Without touching upon the juridical side of this opinion it is important for purposes of an economic investigation to note that during the period of activity, the body of members is subject to constant internal changes. Besides the fact that in the course of lengthy periods of time, the business transactions of each member may change essentially, it must especially be noted that new members may constantly join the cooperative and that old members may withdraw from it. In principle, therefore, the financing system should follow all such structural changes of membership so that the interests of no part of the membership would be violated. In order that the net worth of the cooperative might really be considered as belonging to the members, the members should have the possibility of deriving the total benefit from that part of the cooperative's assets which each one has come to surrender to the cooperative. Further, members should also have the right, in withdrawing from the cooperative, to secure their share of the investment. If all accumulated funds are put into the possession of the cooperative until the time of dissolution, it cannot realistically be considered that the cooperative, in economic sense, is fully in the possession of its members.

If, for instance, in a marketing cooperative, the amount of credit for financing purposes is reduced in such a manner that the capital is repaid by means of paying low prices to the members and the net worth thus increased remains in permanent possession of the cooperative, the financing problem is solved in a way which leads to conflicts with general operation principles set forth above. In the initial situation, when interest was to be paid on all capital, the costs of financing, notwithstanding changes in the structure of the membership body, were always divided in just proportions because of the equalizing effect of the interest payments. In such circumstances, again, the price received by each cooperator for his products, included the whole of his share of the returns. In accumulating funds for the cooperative, on the other hand, a part of the returns is withheld. If a member withdraws from the cooperative, that part of his contribution goes to the benefit

of others. Similarly, in following this method further, misusage will result when new members join the cooperative after considerable amounts of capital, for which no equalizing interest payments are made, have been accumulated at the expense of the older members. For in such circumstances the new members will be spared the payment of that part of the financing costs which falls to their share unless a membership fee is imposed which corresponds to the amount withheld for financing purposes from old members.

Also the non-independence of a cooperative is relying on the manner in which capitalization is arranged. If a cooperative accumulates funds, the actual ownership of which remains to the cooperative, not to members, the general expansion and development of the business as such, may perhaps come to be the primary goal of the management of the cooperative instead of, as presupposed by the general character of cooperation, the benefit of the members. The intensity of such development, however, depends so greatly on the internal structure of the membership and on the extent to which business transactions are carried on with parties outside the cooperative, that a more detailed examination of the matter must be left to the chapters dealing with the homogeneity of membership and the effects of non-member participation.

The method used in arranging capital ownership rights has a noticeable effect also on the relationship between the cooperative and its members. According to what might be regarded as natural and justified conception of the members, funds withheld from them for augmenting the capital of the cooperative could be regarded in the nature of collective capital used wholly or in part for furthering the group interests, but the actual ownership of which, in an economic sense, they lack. For this reason the members of a marketing cooperative, for example, might be inclined to regard that part of the price paid for their products, which has been withheld by the cooperative, as a permanent loss. In comparing prices paid by cooperatives and competing enterprises, the loyalty of members under these conditions may be hard tried particularly when the cooperative has just been established and when withholdings from prices are bound to be considerable.

A financing arrangement where continuously augmenting funds of considerable magnitude come into the possession of the cooperative may thus, perhaps, lead to an unequitable division of the financing costs, to a change in the goal of activities peculiar to a cooperative and to a weakening in the unity of the cooperators and their coopera-

tive. If, on the other hand, the business capital required by a cooperative for its operations is constantly kept within the possession of the members with just ratios being maintained at the same time between the share of financing costs and business transactions of the members, such defects will not arise as easily and the matter of financing can be said to have been solved in accordance with the general character of cooperation.

In principle, when debts to creditors outside the cooperative are being repaid by withholding a part of the returns for this purpose, the indebtedness to the members should simultaneously be regarded as increased. One method to eliminate defects which arise from the division of financing costs in the manner above described, would be to pay interest at current rates on investments.

How the problem set forth might best be solved, must be regarded chiefly as a technical aspect, although as one of practical importance. In this sense special attention ought to be given to the conditions surrounding maturity and cancellation of member loans. A plan which in theory can be recommended and which has quite generally been successfully applied has been developed in the United States and is known as "Revolving Fund Plan". Inasmuch as the problem of capital obviously occupies an important position in the formation of cooperative activity, it has been deemed appropriate to examine in slightly more detail the principles of the revolving fund system, in the light of some examples.

STOKDYK (1949, p. 5) gives an example where it is assumed that an association began operations in 1939 with facilities costing $25,000, a mortgage debt of $15,000, an original investment on the part of members of $15,000 and capital retains of $3000 each year. The financing system thus obtained is illustrated in Table 2.

From the table it can be seen that the withholdings used for the payment of the mortgage debt have been indicated as additions in the column showing the amount of member investment. In this example, the revolving fund financing was begun in 1944, after the mortgage debt had been extinguished. Supposing that the operation is successful and no more funds are needed for capital at the time, the amount of $3000 withheld from the members in 1939 is revolved to them. Of course the refund is only nominal in the case of those who continue their business activities with the cooperative to the same extent as during the first year of operations. Those who have withdrawn from the cooperative and those who have reduced their business transactions get their refunds in just proportions, while those who have joined

Table 2.

Capital statement of a cooperative on revolving capital basis

Year	Total membership investment at beginning of year $	Mortgage debt at beginning of year $	Capital added by 6-cent-per-unit deduction $	Capital revolved $	Total membership investment at end of year $
1939	15,000	15,000	3,000	—	18,000
1940	18,000	12,000	3,000	—	21,000
1941	21,000	9,000	3,000	—	24,000
1942	24,000	6,000	3,000	—	27,000
1943	27,000	3,000	3,000	—	30,000
1944	30,000	—	3,000	3,000	30,000
1945	30,000	—	3,000	3,000	30,000

the cooperative during 1940 or later and those who have expanded their business transactions come to contribute a corresponding additional amount of capital for the use of the cooperative.

A completely proportionate division of the financing costs would require the payment of interest on the membership investment. The revolving fund system suggested in the example does not take into consideration those changes in membership structure that take place during the time of revolution but makes the appropriate adjustments only at comparatively long intervals. In this respect the practice in cooperatives following the revolving fund system has been variable (cf. BACKEN & SHAARS 1937).

The revolving fund system has also been adopted by some cooperatives in Finland, where the problem of capitalization, because of the inflation and the urgent post-war need for renewal of production plants, has caused many difficulties. The shifting to the revolving fund system can here, however, be regarded not only as a new method for accumulating capital necessitated by a tight credit situation, but also as a sign indicating development in the purely economic thinking within the cooperative movement.

As an example providing further information in regard to the matter here considered, the practical function of the revolving fund at the Valkeakoski Osuusmeijeri (Valkeakoski Cooperative Dairy) will here be briefly discussed. This dairy, in connection with a complete modernization, has come to employ considerable amounts of credit, so that at the end of the year 1952 long-term loans alone amounted to 188.7

million marks or to about 83 per cent of the total assets. To make the needed adjustments an amount of one mark per liter of milk (about 5 per cent of the price) is withheld from each member. For these withheld funds, for which members are given producers' equities, an interest is paid which exceeds by ½ per cent the interest paid by commercial banks. The loan conditions rendered in the 1954 equities are as follows:

1. Up to the beginning of 1960 the loan cannot be cancelled by either party, but may thereafter be cancelled and will mature for payment six months after the notice of cancellation.
2. The interest on the loan is one half of one per cent higher than that paid at any given time by commercial banks, the interest being payable annually at the close of the year.
3. If the party who originally obtains the loan contract transfers it to another party, the fact of the transference must be entered on the contract after which we must be informed thereof and the contract presented to us for our marking, failing which we may legally pay the amount of the loan and interest thereon to the party obtaining the contract originally.
4. If the party to whom this loan contract is issued dies or moves from the locality, he himself or some party empowered to do so, may give notice of cancellation of this loan contract and it will thereafter mature for payment six months after notice is given.
5. When this loan contract has matured for payment in accordance with the conditions of the loan, the loan will be repaid only against this contract.
6. A milk producer of our cooperative or the party to whom this loan contract has been transferred shall not have the right, by virtue of this contract, to make any demands on us before June 30, 1960, except as respects interest.

According to these stipulations, the revolving period of the fund will be seven years. If the quantity of milk received by this dairy will continue throughout this period to be of the magnitude of the year 1953, or 7.6 million kilograms, an ample 50 million marks of capital will accumulate. In this example the revolution of capital begins much before all mortgage debts have been extinguished. But it must be observed that a longer revolving period might weaken the relations between cooperative and members when it is a matter of withholdings of such considerable magnitude.

Finally, there is reason once more to stress that a revolving fund

as such does not in principle constitute an essential feature of cooperation. In fact it is only a certain technical form of member financing, a method with the help of which the problem of distributing financing costs has been successfully solved.

2.3.5. *Homogeneity of Membership*

When the cooperative is defined as a firm directly serving its members' operations in a manner most advantageous to all of them, the concept necessarily presupposes uniformity of economic interest among the members. This has been expressed already by LIEFMANN (1921, p. 143) as he states: "Das Wesen der Genossenschaften besteht also darin, dass sie die private Wirtschaftstätigkeit ihrer Mitglieder in irgendeinem Punkte durch gemeinsame Wirtschaftsbetriebe fördern oder ergänzen. Die Mitglieder gehören also immer einer bestimmten wirtschaftlichen Gruppe an, sind gegenüber dem Genossenschaftszweck wirtschaftlich in der gleichen Stellung." In order that a cooperative may, within the above meaning, simultaneously serve all its members without the services performed for one group becoming disadvantageous to other members, the obligations imposed on the cooperative by all its members must be similar in goal; in other words, the membership, in an economic sense, must be homogeneous.

In the cooperative integration, a member may either use the cooperative's output as an input in his own firm, in which case the task of the cooperative is to purchase the supply item for the member or he may leave the produce of his own firm to the cooperative for sale on the market. In the former instance, the desire for lowering the average purchase price of the commodity may be said to be the common economic interest of the members and in the second form of integration the interest will be an increase in the average selling price. Now if some of the members of a cooperative are, for example, buyers of a certain commodity and some of them sellers of the same article, the cooperative cannot, in its business activity, serve all its members in the best possible way, for the economic interests of the different groups of members are in conflict with each other. Memberships in such instances must be regarded as heterogeneous.

EMELIANOFF (1948, p. 194) has especially drawn attention to the composition of memberships. He observes that "the economic units are designed to live and function individually and independently and *they gather into aggregates only if they cannot normally proceed individually*. Every cooperative aggregate of economic units thus is inherently

saturated with centrifugal, disruptive forces." He regards the socio-economic homogeneity of memberships as one of the most important prerequisite in the field of cooperation. EMELIANOFF, who took up the matter in connection with ascertaining the proper mode of voting in cooperatives, includes also social aspects in the concept of homogeneity of members (race, religion and political opinions). These questions will be only shortly referred to in this study in the following chapter dealing wtih the making of economic decisions and solutions.

It will now be of importance, from the point of view of practical co-operation, to examine how far the above presented demand for homogeneous membership can be carried. If the similarity of obligations imposed on the cooperative by its members is taken as a criterion, we can first take a case where the operations of the cooperative are concerned with but one commodity and where the members are either consumers or producers of that commodity. As an example of a cooperative in this class, we may take a producers' cooperative dairy, where the cooperative deals solely with milk produced by its members and where the members' interest lies in getting the product sold as advantageously as possible. Heterogeneity in this case would mean that a part of the members of the cooperative would be consumers or other whose interest would be in buying milk as cheaply as possible.

However, it is easy to see that the homogeneity demands placed on the members cannot be regarded to include the requirement that the members should be producers or consumers of only one commodity. If, for second example, we take a cooperative which both procures for its members the most varied selection of commodities and markets every variety of product produced by its members, the many-sided activity need not in itself be deemed as leading to conflicts of interests in setting the goals for the cooperative's functions. Compared with the first example, there will, nevertheless, be compromises in the matter of fixing prices. If the question concerns, for example, a purchasing cooperative dealing with farm supplies, it is in general not possible to make cost calculations for each commodity with a precision that assures a completely correct result. Thus too high a price might be imposed on the purchasers of machinery and too low a price on the buyers of fertilizers, an error which would appear also in paying proportionately the same amount of refunds to all purchases. But here it is to be noted that an increase in the number of commodities handled often signifies a discernible improvement in the utilization of the cooperative's capacity, so that the achieved reduction in costs is economically more important than the possible error. Moreover, the eco-

nomic significance of an error in pricing will finally depend on the extent to which all the members deliver to or procure from articles handled by the cooperative in the same proportions. This error can frequently be considered quite insignificant if the members, in regard to their activity, are similar economic units, for example, solely purchasers of agricultural supplies for similar farms. On the other hand, in so far as the members are divided into two or more groups, for example, in such a way that the cooperative procures agricultural supplies for only a part of the members, the other part being composed of buyers of mainly consumer goods, the possible errors in pricing will assume greater significance supposing that the accounts for the different sections are not kept separately.

For the third case we may think of a cooperative which functions both as an agency for procuring supplies and for marketing produce, in other words, a cooperative which functions both as a purchasing and as a marketing cooperative. The cause which leads to such an expansion in the field of activity of the firm is, as in the preceding instance, above all the attempt to improve the utilization of capacity. In so far as the internal structure of the membership is such that the services which it demands of the cooperative are uniform, the cooperative in its activity can simultaneously serve the interests of all members. For instance, the membership of such a cooperative which is dealing with agricultural supplies and products can be regarded as homogeneous from the point of view of economics.

Special attention ought now to be paid to the fact that the economic interests of members are uniform only in a case where none of the commodities handled by the cooperative is at the same time a product of one part of the membership and a supply of the other part. Since such a situation clearly tends to cause conflicts, it is desired in what follows to examine certain cases taken from practical experience, in which the problem will be clearly revealed. In this sense the SOK member cooperative stores will be first taken under examination. Their business activities can, in general, be divided into three principal categories: business with farm supplies, farm products and consumer goods.

For the analysis of the present problem the attention should be centered on the extent to which there are groups in the membership whose economic interests may come into conflict with each other. It appears from the available statistics that the relative share of agricultural produce of the total turnover was relatively great during the war years, but that it has then considerably decreased, now making

up only about 13–14 per cent of the turnover. The business with agricultural supplies has lately, on the other hand, shown a slight increase, making now about 16 per cent of the turnover leaving some 70 per cent to consumer goods.

SOK member cooperative stores thus act as (*a*) purchasing cooperatives for members in need of agricultural supplies and consumer goods, and as (*b*) marketing cooperatives for agricultural producers. In so far as the buyers of the two first mentioned commodity groups represent the same economic units and the purchases take place approximately in the same proportion, the expansion of the cooperative's activity to include both agricultural supplies and consumer goods does not necessarily tend to cause conflicts. Secondly the part of the membership which delivers agricultural produce for sale and buys consumer goods not produced on the farms, must in general be regarded as rather uniform. The membership is thus heterogeneous to the extent only to which the cooperative sells to the consumer members agricultural products bought from other members. The interests of the former would require the cooperative to fix the price of the commodities in question as low as possible, which understandably conflicts with the interests of the producer members.

As a second practical example we may examine the business conducted by credit societies. If the function of the credit societies is to provide loans to its members, it may be regarded as a purchasing cooperative, but if on the other hand it acts as intermediary in transferring capital utilization-rights of its members to others, the firm in question is a marketing cooperative. As an example of credit society in the first-mentioned class, The Production Credit System in the United States (cf., e.g., MURRAY 1949) might be mentioned. In this system the function given to the cooperatives is to procure credit for their farmer members on as advantageous terms as possible. In practice the procurement of capital takes place in such a way that the central bank sells bonds on the market and loans the funds thus obtained to the members of the local associations.

If, on the other hand, a cooperative bank conducts business both as depositor and creditor so that the bank is a purchasing cooperative for the part of the members who set in deposits and a marketing cooperative for those members who are borrowers, it has no possibilities of furthering the interests of all members simultaneously. The interests of such members as are desirous of surrendering the right of using their capital would require the cooperative to conduct its affairs so that the members would get as high an interest for their capital as

possible. The interest of the other members, again, would require the cooperative to procure capital for their use on the lowest possible terms. Thus the interests of the different groups of members are in conflict with each other, and the membership of a cooperative thus organized cannot be regarded as homogeneous.

Naturally, the grouping of the members of a cooperative in the foregoing manner, into depositors and borrowers, is to some degree schematic. The division is by no means permanent, but the individual members go over from one group to the other in the course of time and thus also their economic goals are subject to changes. Such development cannot, however, refute the fact that to a cooperative organized in this manner cannot be set uniform economic goals in the same sense as in the cases of pure marketing and purchasing cooperatives having homogeneous memberships.

2.3.6. *Economic Solutions and Decisions*

According to traditional modes of thought, the equality of members in the use of the powers of decision, has always been regarded as one of the most important principles of cooperation. Robotka (1947), in relating the causes leading to this, points to the previously generally accepted opinion that a cooperative is in principle an association of human beings. He recalls the situation prevailing in the early stage of the cooperative movement in England when the workers had no representation in the affairs of government and for that reason it was natural that in the sphere of their own organization all discrimination among the members was shunned in the matter of voting. This principle of equal voting, arising from political and psychological sources and perhaps also, in part, influenced by the fact that for the members of the first cooperatives proportional voting power had been in practice just the same as the adopted equal voting, has been generally accepted for a whole century. It is only during the past few years that certain workers, especially Americans, have thrown the searchlight of critical examination on this traditional cooperative principle.

In an economic analysis this generally accepted principle of voting appears in an altogether new light. It can be presented as a natural demand that this provision should be uniform with other main principles followed. Since according to the purely economic opinion here adopted the advantages as well as the responsibilities are divided among the members on a patronage basis, the powers of control should be divided in the same way, if the first mentioned principle is desired to be consistently fulfilled.

Let us here consider, for example, the distribution of the annual surpluses of cooperatives which, as mentioned earlier, should occur on a patronage basis. In practice it is general, and sometimes the rule, that the annual profit is not refunded to the members but that a part thereof is transferred to the possession of the cooperative. Although we should start from the presupposition that the cooperative is owned by its members and that therefore the part of the annual surplus which is transferred to the cooperative actually remains in the ownership of the members, this nevertheless does not, in every instance, mean the same as a disposition of funds in accordance with the wishes of all members. Important in the distribution is not only the amount of the refund to each member but also the form in which the share is given. Since every member, in production planning of his firm, is in a special way dependent on the refunds to be obtained from the cooperative or on the possible retains deducted from the proceeds of sale, the matter must be given serious consideration.

Let us take, to illustrate the problem, a marketing cooperative with five members as a hypothetical example. Let us suppose further that one of the members has expanded the production of his firm to a level considerably above the others, basing his calculations on the assumption that the whole surplus, proportionately of the same size as in previous years, will be returned to the members. It would then be in conflict with the economic goal of the cooperative, if each member had equal voting power in regard to the distribution of the surplus and if thus a decision could be carried out with least possible majority towards the end of the year that no dividends shall be paid but during the five subsequent years a capital retain of 10 per cent will be deducted from the proceeds of sale.

Adherence to a democratic mode of voting thus renders uncertain a thoroughly consistent fulfillment of the generally accepted principle of profit distribution. Division of the voting power according to the same principle as distribution of the surpluses, i.e. in proportion to patronage, would best assure fulfillment of the cooperative's economic goals, notwithstanding the violation of traditional doctrines thus caused.

In his principal discussion on the appropriate basis of control in cooperatives EMELIANOFF (1948, p. 195) states: "Actually, an overwhelming majority of existing cooperative associations are organizations with distinctly homogeneous membership. *A proportional voting power of such homogeneous membership is, in practice, 'equal' voting.*" It should be noted that "homogeneity" in this statement is understood

in the sense that the transactions of the members are of same magnitude. Thus the economic homogeneity of members as defined in the preceding chapter according to whether or not the goals set for the cooperative by all members are in harmony with each other, is not sufficient basis for the use of equal voting. If the firms represented by the members vary in nature or size, a democratic method of voting cannot be recommended without reservation. Especial inconsistency in the principle of democracy is the generally accepted practice that local cooperatives have all one vote in the meetings of the central organization irrespective of their size or, in other words, the method that e.g. a membership of five thousand has no more to say about running the central organization than a membership of five hundred.

Robotka (1947) especially stresses that equal voting has a tendency to repel such firms of more than average size which, upon entering a cooperative, should assume a correspondingly large share of responsibility for costs and risk. And so he notes that in certain circumstances unequal voting has been found to be the only method leading to results in trying to get the necessary amount of participation. It would be easy to pick up many examples from actual practice in different countries where voting takes place proportionately, for example according to the acreage, number of fruit trees or cows.

To prevent misunderstanding of the ideas expressed in the foregoing, it is considered necessary to stress the difficulties attendant upon an investigation of the cooperative movement, difficulties which were already discussed in connection with the specification of the problem and which appear within the framework of this chapter. Deviating from the opinion accepted in this study cooperation can of course also be regarded as an institution which has its own modes of conduct which are partly ethical and partly social. Cooperation should in such circumstances be examined only on the basis of existing conditions as generally accepted, and even in such a way that, for example, some conduct adopted on a socio-ethical basis should be regarded as in some way first in the scale of values, absolutely belonging to a concept of institutionalized cooperation (cf. Aresvik 1955). There is no intention, however, in this work to compare human scales of values and therefore pointing to certain economic conflicts, whether they arise from modes of voting or number of members, must in no case be regarded as advice to alter existing practices, as for example to go over to proportional voting or to restrict membership. The task of an economic investigation is merely to study, in accordance with accepted concepts, the institution in question by examination of the characteris-

tics in its operation and thus to indicate to the significant economic conflicts realized also when they arise from social and ethical causes.

2.3.7. *Effect of Non-member Participation*

In the foregoing, it has been assumed that the business transactions between cooperative and members represent the total activity of the cooperative. However, as it is quite general that cooperatives also maintain business relations outside the membership, it is relevant to give attention to the significance of such activity and especially to regard the applicability of such business to the economic principles of cooperation.

It seems to be possible to get a clear picture of the problem by considering a marketing cooperative in *statu nascendi* (Figure 17). In order to simplify the treatment it is assumed that the output level of the cooperative will not affect the price of the produce sold. The average return of the cooperative is thus the same as the marginal return ($AR = MR$). The average operating cost of the cooperative as a function of the output level is illustrated, as previously, by the vertical difference of curves AC_0 and AC_1. The distance of curve AC_1 from the horizontal axis then shows the average cost in member enterprises. Supposing now that there is an amount of prospective members corresponding to the output level of only OM, a loss of P_1P_2 per unit would accrue. If the business transactions of non-members were at least MN, the cooperative would avert losses.

It might also be thought that the membership would be slightly larger, than in the foregoing, for example ON, which by itself would make operations possible without losses. Obviously, the maintenance of business with non-members would in this case also de advantageous because with an increase in the degree of capacity utilization the average operating costs decline perceptibly, as illustrated by AC_0, and a price higher than the production costs might be paid to the members. If business transactions with non-members were NK, the members might be paid in excess to the initial price OP a refund of F_1P_2 per unit. Since the membership was assumed to represent output level ON, and the cooperative is supposed to pay initially only the production cost price for the products, the extra compensation due to non-members, would still remain as a profit to the cooperative. In the figure the amount of this compensation is expressed by $F_1P_2 \times NK$. This, of course, could be distributed to the members as a surplus or withheld for reserves of the cooperative if it is not paid to non-members.

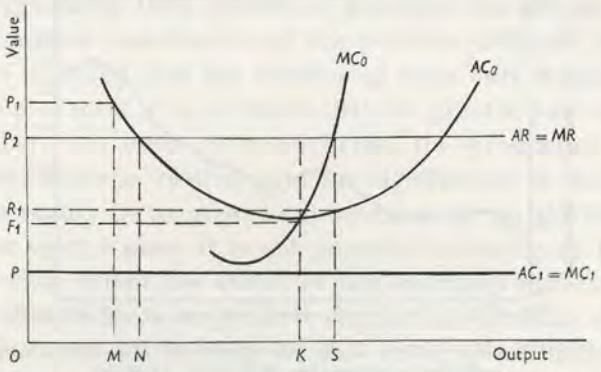

Fig. 17.

Finally question may be raised as to the attitude to be assumed towards non-members in a situation where the optimum output level is attained by the production of the member firms alone. As shown in the foregoing, this optimum is attained, taking due consideration of assumed limitations, at the level where the sum of the cooperative's average operation cost and the corresponding cost of the member firms attains minimum. Since, in the situation examined, the unit price is a constant, the optimum output level is *OK*. Assuming that the cooperative will refund the whole surplus to its members, the size of the refund will be F_1P_2 per unit, as above. But in that case no unrefunded surplus would be pooled to the cooperative. In so far as the membership would be further increased, for instance to an extent *KS*, the refund ought to be reduced ($R_1P_2 < F_1P_2$). If, on the other hand, a similar increase in business operations were to take place with the help of non-members, the situation would be another, for with the output level being *OS*, the cooperative attains the maximum of total surplus. Supposing that the share of surplus of non-members can be counted to the benefit of the members, business transactions with non-members would redound to the advantage of members, even after the cooperative had attained its optimum output level.

Inasmuch as business operations with non-members has in many instances shown to produce benefits for the members, it remains to appraise the effect of such operations on the character of cooperation in general. The practical significance of the matter is considerable. For it must be remembered that a cooperative, because of the peculiar nature of its business operations, has in many countries been given a legal status different from that of business enterprises (cf. VALKO 1954). Thus, for instance, surplus refunds are, in many countries not

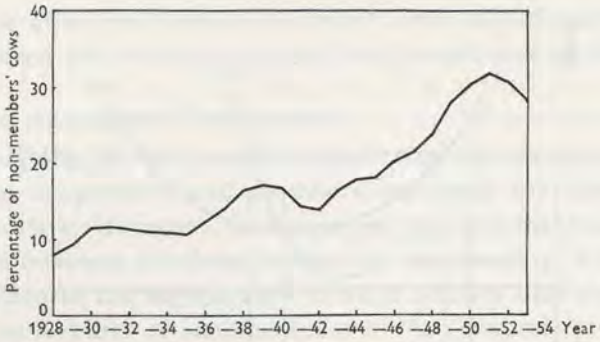

Fig. 18. The relative significance of non-members in the operations of the Valio member cooperative daires in 1928–53.

taxed as heavily as profits of enterprises. In such instances the law regards surplus refunds in the nature of adjustments in accountings, and by no means as a declaring of dividends on stock.

Naturally the effect of business transactions with non-members on the character of the cooperative as a whole is dependent on the relative share of the members in the business operations. Therefore it will be endeavored, in what follows, firstly to illustrate the significance of this problem with the help of some practical examples and only thereafter to give general treatment of the problems involved.

Although statistical material available in Finland to illustrate the extent of business transactions of cooperatives with non-members is scarce, a fairly satisfactory idea of the situation can be obtained from practice in the case of cooperative dairies and especially in the case of the SOK member cooperative stores.

It does not directly appear from the Business Statistics of Cooperative Dairies in Finland (Suomen osuusmeijerien liiketilasto) what part of the total quantity of milk received comes from non-members, but on the other hand information is given as to the number of cows of both members and non-members for the years 1928–1954. On the basis of these statistics, Figure 18 (Appendix 8) gives the significance of non-members in the operations of the Valio member cooperative dairies. It appears very clearly from the figure that the significance of non-members was during the thirties relatively small. Yet during the World War II and the period following it, the proportion of non-members has grown considerably but lately attention has been given to this question and the direction of the development has been changed.

The significance of this problem on the activities of cooperative dairies cannot, however, be quite satisfactorily treated on the basis of information available. Besides inexactitudes in statistics, especially

for the time preceding 1946, reasons of principle can also be presented which make a close examination of the problem difficult. In the first place it must be noted that the number of cows only roughly reflects the production of milk. It is probable that the greater part of the cows of non-members are units of small herds, the production of which falls below the average. In that case the significance of non-members would not in reality be as great as it seems to be on the basis of the figure. In the second place it is not possible to determine from these statistics to what extent the status of non-members differs from that of members. Only when a cooperative engages in economic discrimination on the basis of membership we can speak of members and non-members in this connection. If, for instance, the same unit price is paid to all producers using the services of a marketing cooperative and if the same amount of surplus refund is paid and in other respects all producers are treated similarly, then all these producers may, in an economic sense, be regarded as members.

Statistics on the SOK member cooperative stores do not directly show the extent of business transactions with non-members. It is nevertheless possible to ascertain this by calculating the capital value of the surplus refund with the help of the refund percentages given and by comparing this capitalized value with the total turnover. It may, of course, be said with regard to this method, that a part of the members may fail to redeem their surplus refunds or lose their vouchers, so that in such circumstances the membership is reduced from what it actually is. However, from the above calculation the share of active members can be ascertained with satisfactory precision, which is the most interesting from the point of view on the matter in hand.

For the purposes of this study it has been necessary to eliminate from the statistics all such cooperative stores as have not made any refunds. Similarly, on account of deficient information,[1] such cooperative stores as make refunds to both members and non-members, have been left out. Thus the calculations made in the following on the basis of available statistics do not correspond to the average situation in the SOK member cooperative stores. But in spite of the deletions, a very ample number of cooperative stores, on the average 226 for each year, remains as objects for examination for the period 1930–53.

As the problem before us is, above all, to show by way of an example, how the presence and effects of certain theoretically studied factors

[1] The statistics report the refund percentages of both members and non-members, but the refunded amount only as a total, so that comparison with the turnover is not possible.

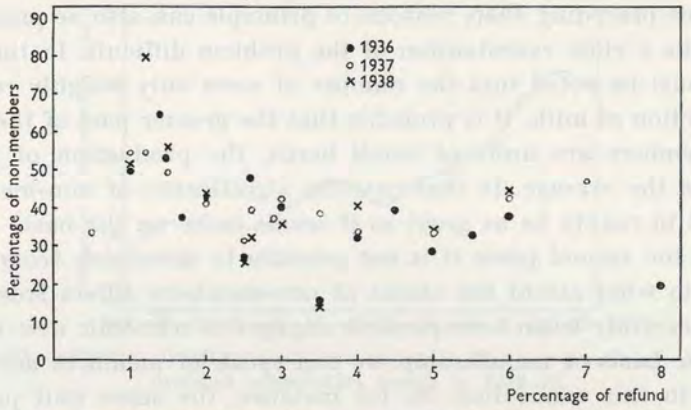

Fig. 19 a. The correlation between the non-members' share in the business turnover and the percentage of refund in certain SOK member cooperative stores in 1936–38.

can also be observed in practice, and not the investigation of a certain branch of cooperation, it has been deemed possible to concentrate the examination at first to two three-year periods of time.

If the cooperative obtains, for each output unit, a certain surplus, of which non-members do not get a share in connection with the surplus refund payments, then the greater the part of non-members in the business turnover is, the greater will be the surplus distributed to the members. Thus it would appear probable that there is a certain relation between the share of non-members and the surplus refund. To find an answer to this problem, the cooperatives under examina-

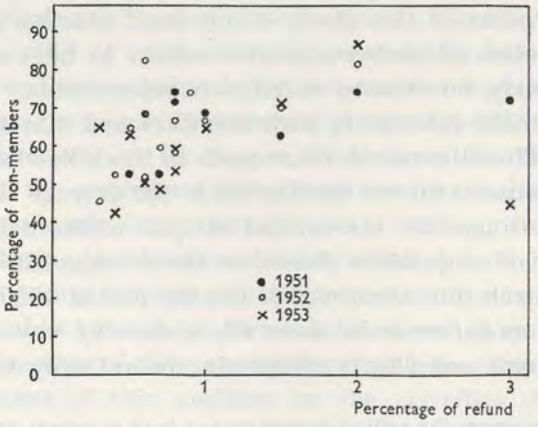

Fig. 19 b. The correlation between the non-members' share in the business turnover and the percentage of refund in certain SOK member cooperative stores in 1951–53.

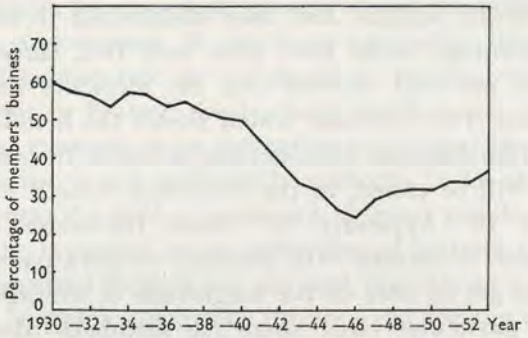

Fig. 20. The members' share of business turnover in certain SOK member cooperative stores.

tion have been grouped according to the percentage of their refunds and in each group the share of non-members in the business turnover has been calculated. To indicate the assumed correlation, the values thus arrived at (cf. Appendix 9) have been marked in the coordinations in Figures 19 a and 19 b[1] the horizontal axis of which shows the percentage of refund and the vertical axis the share of non-members in the business turnover.

It becomes very clear from the Figures 19 a and 19 b that the refund percentage is not directly dependent on the share of non-members in either time period. And it can, indeed, be noted that the refund percentage as such is not the right basis of comparison in solving the problem. More carefully determined, the question should read: Is a refund to members higher than that presupposed by their share in the business transactions? The amount of surplus refunds in marks paid by each cooperative is to be regarded as dependent on the accuracy of cost and return estimations of the manager of the cooperative, as stated before. Thus the amount which in each case can be distributed among all who have participated in the transactions or only to members is naturally not directly correlated with the share of non-members. To find the answer to our problem therefore, it must be calculated how great the refund percentage would have been if surplus funds had been distributed among all participants and this must be compared with the percentage actually refunded. Suppose, for example, that from the surplus available in a certain cooperative it has been possible to pay refund at the rate of six per cent to the

[1] In Figures 19 a and 19 b it should be noted that the weight of each plot is not equal. The number of cooperative stores represented by each plot appears from Appendix 9.

members, but if the surplus had been distributed to all participants the refund percentage could have been only two, since the share of non-members is per cent. In this case the members have received a three-fold refund. This relation, which shows the benefit obtained by the members from business transactions between the cooperative and non-members, will be called, in the following, benefit coefficient.

From Figure 20 (Appendix 10) which illustrates the members' share of business in certain SOK member cooperative stores in 1930 –53 it is easy to get an idea of the magnitude of average benefit coefficient in this particular case. Since the members' share is varying from 59.8 per cent in 1930 to 29.0 in 1947 the maximum average benefit coefficient for these cooperative stores has been 3.4 and the corresponding minimum 1.7. However, it is to be notified that in some individual cases the share of non-members and the benefit coefficient have been much higher than the averages as for example the Figures 19 a and 19 b illustrate. An extreme case is formed by two cooperative stores in 1953, in which the participation of the members was only about 14 per cent. 86 per cent of the surplus refund paid to this minority represents profits gathered with the help of non-members and only 14 per cent the actual surplus entitled to them, to say nothing of the fact that, correspondingly, the preponderantly greater part of the cooperatives' reserves and other capital have been accrued from business carried on with non-members.

It is important to note further that in a case of dissolution of the cooperative all the reserves will be distributed to members and thus there might be discrimination between members and non-members even in the case that both groups are equally treated in distribution of the surpluses. This owes naturally to the fact that the capitalization of the cooperative takes place at cost of both members and non-members.

In principle it is perfectly clear that a cooperative, to the extent to which it engages in business with non-members and thus gathers profits for its members, has lost its purely cooperative character. Although the distribution of profits among the members takes place in proportion to the utilization of the cooperative and not, for example, on the basis of invested capital, a cooperative following such conduct must be deemed to have decisively lost the character of a non-independent economic entity and to have changed into an enterprise striving to maximize profits. In such a case the right of the cooperative concerned to operate under the special laws designed for cooperatives may be questioned.

It may of course be remarked, in view of the foregoing, that joining a cooperative is voluntary. If all those who avail themselves of the services of the cooperative do not desire to become members, the cooperative cannot be blamed for it. Such indifference, however, might be regarded for example as an indication of the fact that the operation of the cooperative is not sufficiently uniform to be able to bring all its customers into the fold of members. A great number of non-members can also be regarded as an indication of activity for which a cooperatively organized firm is not the best possible or as an indication of a situation in which conditions do not exist for the development of a genuine cooperative movement.

It is interesting to note, in this connection, that in some cases special attention has been given in legislation to profits derived from business transactions between a cooperative and non-members and it is demanded that a cooperative must treat non-members the same as members, as far as distribution of surplus refund is concerned. This is the case, e.g., in the United States (cf. SUNDERLIN 1947). If a cooperative markets products of non-members, the income from sales, with deductions for necessary operating costs, must be refunded to them in quite the same manner as to members. Otherwise the firm does not fulfill the requirements placed on the cooperative by law. To prove its cooperative character, a cooperative in its bookeeping must separately set forth the extent of business carried on with non-members and members and provide other necessary information. It remains to be especially mentioned that cooperatives do not have the right to invest profits derived from business with non-members in their reserves for such purposes as for example expanding the business.

2.3.8. *Nature of Cooperative Integration*

Although it has been possible, in the foregoing, to study the nature of cooperation in many aspects, certain over-simplifications have been made which cannot be accepted in any definite formulation of the pure theory of cooperation. With respect to the operation of member firms this over-simplification has arisen by assuming that expansion of a cooperative can take place only by increasing the number of members. In so doing each member firm's output, cost of production and patronage have been regarded as constants. Thus the central idea of cooperation, the combining of two separate economic functions, i.e., the integrated character of cooperation has not yet been fully developed. (Cf. KAARLEHTO 1955.)

In economic theory it would be very easy to describe the behavior

of two integrated economic units by means of cost and return curves. If, for instance, one of the units is a producing and the other a marketing firm, the qualifications for optimum resource allocation could be presented by means of simple cost and return summation. In the cooperative form of integration, however, there are many independent economic units to perform one of the coordinated functions. It is for this reason that the presentation of cooperative form of integration seems to be somewhat more complicated.

For example, in a cooperative production-marketing integration it is impossible to summate production and marketing costs as in the simple case where only two economic units agree to function coordinately. This is due to the heterogeneity in the production costs of the member firms of the organization. A joint cost curve could be drawn up only if the amount of production in each unit could be regarded as constant, which of course would be incorrect. Consequently, to illustrate the operation of a cooperative association it is necessary to discover a function showing the average returns to each individual member firm, a joint average return curve which forms a basis for the members in their decisions concerning resource allocation independently of the heterogeneity in the production costs.

The basic idea of cooperation, in marketing as well as in purchasing associations, is the integration of two economic functions, production and the ordinary business activities. In theory there is no need to treat these two forms of cooperation separately just because business activities come first in purchasing cooperatives, and production in marketing cooperatives. Consequently, it has been regarded possible to develop in this study a joint analysis of the cooperative form of economic integration.

In marketing cooperatives it is possible to determine such a joint average return by subtracting the average marketing cost from the average return received in selling at different levels of output of the cooperative. In purchasing cooperatives the average return from the supply item bought through the cooperative corresponds to the average return received in selling.

Let us now suppose that in Figure 21, Part A, curve AC_0 presents the operation costs of a cooperative plant X, while AR_0 shows the average return for the commodity handled. Because no payments to member firms are included in the operation costs AC_0, the vertical distance between AR_0 and AC_0 shows what is left for the member firms' production costs and profit at different levels of output of the cooperative.

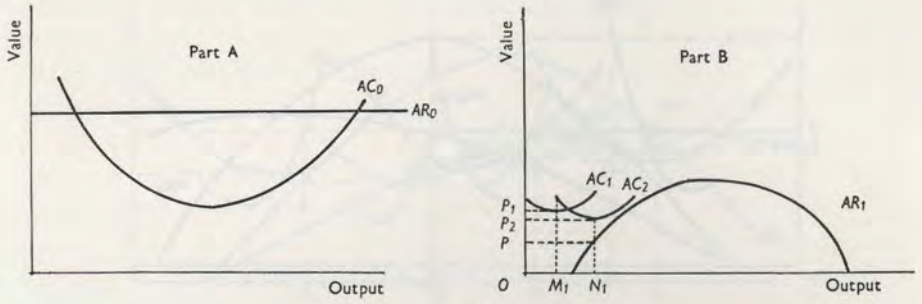

Fig. 21.

By calculating this difference it is possible to determine the average return for all member firms and draw a corresponding curve AR_1 in Figure 21, Part B. This curve could be regarded from the viewpoint of the member firms as a demand curve for their commodity because it shows each member how the average value of his products depends on the total supply.

Curves AC_1 and AC_2 in Figure 21, Part B, show the production costs of two firms willing to carry on their business through a cooperative plant such as X. The minimum of AC_1 and AC_2 is reached at outputs OM_1 and M_1N_1 while the total output would be ON_1. The average income obtained by the firms from the cooperative at output ON_1 would be only OP, which is less than what is required to cover the production costs of the two firms OP_1 and OP_2. Thus an economic loss would be incurred at this level of output of the member firms.

According to the standard value theory, the profit of a firm is maximized at the level of output where marginal return equals marginal cost. Figure 22, where the scale of Figure 21 is enlarged, now shows

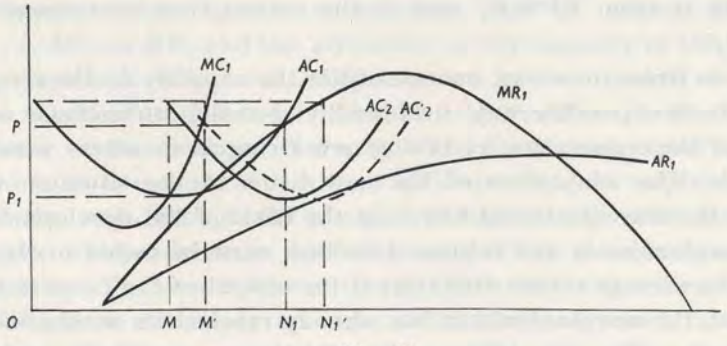

Fig. 22.

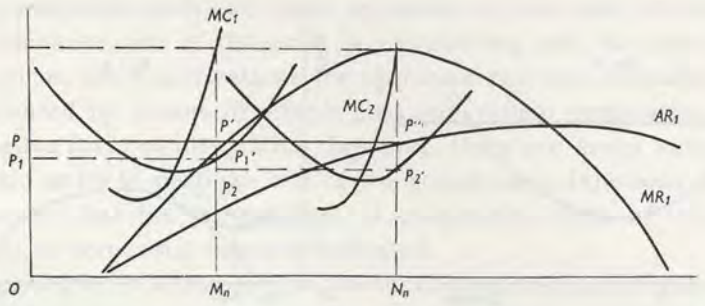

Fig. 23.

what possibilities are open to the member firms of the cooperative to improve the situation by increasing their output.

As can be seen in Figure 22 the marginal return to the members is OP when the output of the cooperative is ON_1 being thus higher than the marginal cost OP_1 of the first member firm. The entrepreneur of the first member firm consequently increases his output with MM'. As a result of the increase the curve AC_2 has to be moved correspondingly to the right in the diagram to a new situation AC'_2. After this increase in output the operation becomes profitable. The second entrepreneur also seeks to equate his marginal cost with marginal return by increasing his output. It is readily seen that every increase in output means a rise in marginal return and consequently leads to a demand for new increases in output until equilibrium has been attained.

At equilibrium, Figure 23, the output OM_n equates marginal cost with marginal return in the first, and output M_nN_n in the second member firm. Thus when the output of the cooperative is ON_n, an average price of OP per unit can be obtained by the members. The profit in the first firm is then $PP'P_1P_1'$ and in the second firm correspondingly $P'P''P_2P_2'$.

The two firms, however, cannot utilize the capacity of the cooperative in the best possible way. It is readily seen that an increase in the output of the cooperative by taking new firms as members would be profitable. The adaptation of the new firms to the situation takes place in the way illustrated above on the basis of the development of their marginal costs and return. Attention must be called to the fact that while average return still rises if the output of the cooperative is increased, the marginal return has already reached its maximum and is decreasing. Therefore, if the output of the cooperative is increased

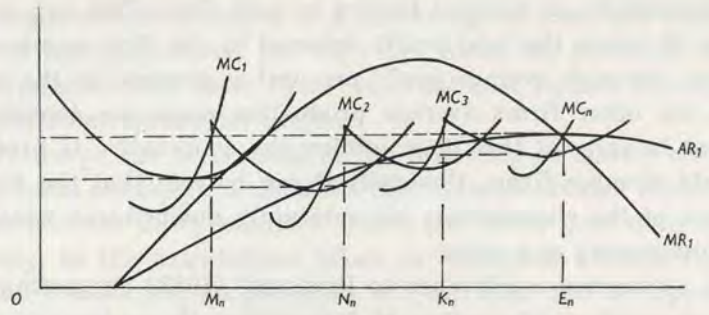

Fig. 24.

by taking new members, it is profitable to the old ones to decrease their firms' output to some extent.

In this new situation the average return received by the member firms of the cooperative is higher than before when only two firms participated in the association. The question now arises as to what extent the output of the cooperative can be increased by taking new members without any disadvantage to the old ones. Generally speaking, to find the most favorable circumstances for the operation policy of a firm with given cost function it is necessary to find the highest average return for its product. In the case studied the operation of the cooperative has to be extended to the level where AR_1 reaches its maximum.

The two assumptions that have to be granted for the equilibrium situation in cooperative integration are consequently:

(1) that the output level in each member firm is optimal;

(2) that the number of member firms is sufficient to utilize the capacity of the cooperative plant in the best possible way.

Figure 24 illustrates the equilibrium in cooperative integration. All the member firms operate at optimum level of output, MC_1, MC_2, $MC_3 \ldots MC_n = MR_1$ and the utilization of the capacity of the cooperative is optimal, $MR_1 = AR_1$. Any increase in the number of member firms would cause losses for the old members either in the form of a decrease in the average return obtained or because some members would have to operate at less than optimum level of output.

All the way through the analysis it has been possible to observe the great independence in the functioning of the member firms of the cooperative. The cooperative naturally treats its member firms equally, but this does not imply an even distribution of profits among the members. Optimal resource allocation and the final operation results

depend essentially on internal factors in each firm. This can be seen in Figure 24 where the total profit obtained by the first member firm is greatest although average profit per unit is greatest in the second firm. In the other firms average production costs are considerably higher but in spite of this their joining the cooperative is profitable for the old member firms. Generally it can be said that the member enterprises of the cooperatives are internally independent while outwardly functioning as a unit.

In this connection a reference to PHILLIPS' (1953) suggesting analysis of cooperative integration is interesting. He endeavors simultaneously to treat the returns and costs of a cooperative and the costs of member enterprises. Since it is impossible, in such circumstances, to present the joint average return curve of the member firms as a factor directing their conduct, it has likewise been impossible to indicate an equilibrium situation of the cooperative's activities. PHILLIPS (1953, p. 79) notes: "The cooperating firm equates the sum of the marginal cost in its individual plant or plants and the marginal cost in the joint plant with the marginal revenue facing the firm in the market where the product is sold." Then he goes on: "The relevant segment of the marginal cost function in the joint plant to each participating entrepreneur is that beginning with the sum of the equilibrium outputs of all other participating entrepreneurs." It is nevertheless easily seen that all changes occurring in the cooperative's output level affect the behavior of all participating entrepreneurs, and that there are therefore no specified different marginal cost areas for each participating entrepreneur. Thus PHILLIPS, determining the limitations of his equilibrium situation, continues: "The precise equilibrium output for any one participating firm cannot be determined unless the equilibrium output for all others is given; without this information the exact segment of the marginal cost function which is relevant cannot be determined."

If, for example, because of the expansion in output of a certain member, the marginal cost of the cooperative increases, it affects all members and all endeavor to acommodate themselves to the changed conditions. For this reason it is difficult to think of a situation described by PHILLIPS, in which, with one exception, all enterprises would be in equilibrium and where the exception would operate independently in its own segment.

In practice the achievement of an optimum level of output depends naturally on the amount of available information. Demands in this respect, however, are in many cases by no means unattainable. The

first requirement of course is a knowledge of cost and return functions of the cooperative. On the other hand the members must also be acquainted with their firms' internal cost factors in striving for maximum entreprenurial profits.

An attempt has been made in the following to clarify the problem on the basis of empirical material. The example studied is chosen from the cooperative dairy industry where the firms deal with one product only. In the calculations taken as examples, average figures obtained from several cooperatives will be used and by appropriately combining these it is, perhaps, possible to form a comparatively clear and reasonably realistic picture even of such factors the clarification of which would be much more difficult in a purely monographic study.

In practice we know, at a given time, the costs of a certain firm at one output level only. In other words, only one point of the cost curve is known for each time period, say a year. Thus the determination of a uniform cost function for a certain dairy is possible only on the basis of statistics compiled during a number of years. The utilization of information gathered over so long a period is made difficult, however, by the fact that the general cost level of different years is affected by many other factors than the level of output. The elimination of these factors (for example the wage level and fluctuations in the prices of supplies) with the necessary precision is very difficult. On the other hand, information gathered for different months or other fractions of the year, cannot either be easily used as the basis for calculations, because many of the cost items in dairies are varying seasonally. The only possibility available here for determining the cost function of dairies on a statistical basis is therefore the making of calculations on the ground of information gathered simultaneously from several dairies. This method implies the somewhat unrealistic assumption that these dairies have about the same capacity but are operating at different degrees of capacity utilization. In order to show how the theory developed can be applied in practice if sufficient knowledge is available we go further in spite of the possible error caused by this assumption.

Suitable material may be found in the Business Statistics of Cooperative Dairies in Finland (Suomen osuusmeijerien liketilasto). The year 1934 has been taken as the object of our investigation. This choice was influenced chiefly by the fact that for approximately the same period there are available milk production cost calculations appropriate for illustrating the cost function of the members. Moreover, for the period mentioned, we can more realistically than at present, estimate

Table 3.

Average operation costs in certain dairies per kilogram of milk received during 1934

Quantity of milk, million kg	Group average	Number of dairies	Average cost, pennies/kg
3.0–3.9	3.4	25	12.3
4.0–4.9	4.4	6	10.8
5.0–5.9	5.5	4	13.7

the price of milk so high that it covers both the operating costs of the dairies and the actual milk production costs. The calculations include all the Valio member dairies which received between 3 and 6 million kilograms of milk yearly and for which operating expenses per 1000 kilograms of milk have been computed in the above-mentioned source of data. The results obtained appear in Table 3.

The calculated average costs are now regarded as representing the costs of dairy A with a given capacity, when it receives 3.4, 4.4 and 5.5 million kilograms of milk. Because of the limited capacity the fluctuation in the output could not be assumed to be greater (cf. Table 1). If it is now assumed that the average return to the dairy is 1.20 marks per kilogram of milk received, irrespective of the level of output, then the average return to the members can be calculated. To compute the corresponding marginal return and marginal cost the average cost of the dairy A at output levels 4 and 6 million kilograms are estimated on the basis of the foregoing calculations.

Table 4.

Dependence of the average and marginal returns to the members of cooperative dairy A on the quantity of milk received

Quantity of milk received, million kg	Average cost to dairy, pennies/kg AC_0	Average return to dairy, pennies/kg AR_0	Average return to members, pennies/kg AR_1	Total return to members, 1,000 marks	Differential return to members, 1,000 marks	Marginal return to members, pennies/kg MR_1
3.4	12.3	120	107.7	3,661.8		
					682.2	113.7
4.0	11.4	120	108.6	4,344.0		
					460.8	115.2
4.4	10.8	120	109.2	4,804.8		
					1,041.7	94.7
5.5	13.7	120	106.3	5,846.5		
					213.5	42.7
6.0	19.0	120	101.0	6,060.0		

Table 5.

Dependence of milk production costs on the quantity of the output

Output per year, kg	Average costs, total, pennies/kg	Fodder costs, pennies/kg	Feeding fodder costs, pennies/kg	Production fodder costs, pennies/kg	Effect of a fodder unit on production	Adjusted production fodder costs, pennies/kg	Adjusted average costs, pennies/kg
3,000	133	91	45.0	46.0	2.30	46.0	91.0
4,000	122	86	36.8	49.2	2.26	50.1	86.9
4,500	119	85	34.0	51.0	2.22	52.8	86.8
5,000	116	85	31.8	53.2	2.15	56.9	88.7
5,500	115	85	29.9	55.1	1.95	64.9	94.8
6,000	114	85	28.5	56.5	1.70	76.4	104.99

In Table 4 the average return to the members is calculated as the difference between the price per kilogram of milk received by the cooperative and the corresponding cost. The total return to all members is naturally a function of the quantity of milk received (produced) and the average return to members; the differential return is the addition to the total return as the quantity of milk received increases by stages. The marginal return has been obtained by dividing the differential return by the figure indicating the increase in the quantity of milk. These figures are supposed to show the development of the average and marginal returns of members of cooperative dairy A and thus they correspond to the values of curves AR_1 and MR_1.

In determining the internal costs of member enterprises ANNILA's (1940) milk production cost calculations have been availed of. These calculations examine the dependence of cost on the per-cow milk production in herds of certain size, in other words, only the fluctuation in output level of member enterprises has been taken into account. However, in the calculations the effect of a fodder unit on production has been assumed to be the same in all production classes and in this respect a deviation has been here made from the said investigation. As there is, regrettably, no information available for this example about the average production capacities of Finnish cattle, it is assumed that the production effect of a fodder unit decreases from a value of 2.3 kg milk/fodder unit on a 3000 kg per year production level to a value of 1.7 kg milk/fodder unit on a 6000 kg per year production level. A milk production cost calculation thus made is presented in Table 5.

Table 6.

Dependence of the marginal costs of milk production on the quantity of the output

Output per year, kg	Average costs, pennies/kg AC_{1-n}	Total costs, marks	Differential costs, marks	Marginal costs, pennies/kg MC_{1-n}
3,000	91.0	2,730		
			746	74.6
4,000	86.9	3,476		
			430	86.0
4,500	86.8	3,906		
			529	105.8
5,000	88.7	4,435		
			779	155.8
5,500	94.8	5,214		
			1,080	216.0
6,000	104.9	6,294		

In the calculations the portion of feeding fodder has been estimated at about 50 per cent of the total fodder costs on a 3000 kg production level (cf. ANNILA 1938). In going over to higher production classes this average has been adjusted in proportion to the increase in production and on the other hand also on the basis of the costs of concentration of fodder (ANNILA 1940).

If we now think of the milk production costs above determined as illustrating the average costs of a member of the cooperative dairy A, the production optimum of this member can easily be determined on the basis of marginal costs and returns received from the cooperative. The example under investigation becomes the more interesting and illustrates better the integrated nature of cooperation if it is assumed that the calculated costs illustrate the production costs of the average cow of the herds of member enterprises of cooperative dairy A. When we now calculate, for purposes of comparison, the average and marginal costs per kilogram for this average cow, they come to be as shown in Table 6.

On the basis of Tables 4 and 6 we can now draw Figure 25 to illustrate cooperative integration with an example which corresponds with realities and which in principle is fully uniform with the figures drawn previously in connection with the theoretical examination of the subject.

In Figure 25 the curve AR_1 therefore indicates the difference between the kilo price obtained by the dairy and the corresponding cost, which difference is the price obtained by the members from the dairy or members' average return as a function of the output of the dairy. The quantity of milk, in millions of kilograms, is thus to be seen in the scale below the horizontal axis. The curve MR_1 calculated on the basis

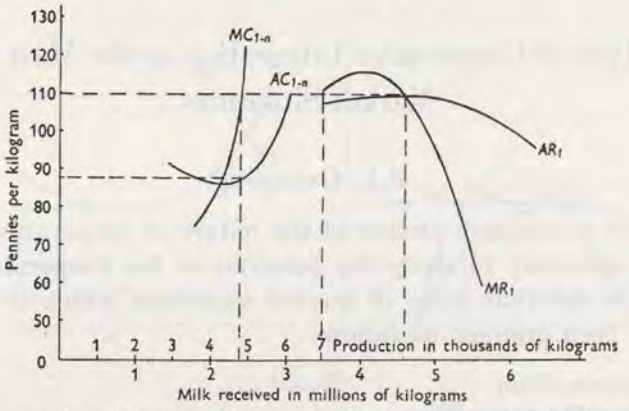

Fig. 25. An example of the equilibrium conditions for a cooperative dairy and a member producer.

of AR_1 values, shows the marginal return of the members, likewise as a function of output of the dairy. Optimum output of the cooperative dairy would now presuppose the receipt of about 4.6 kilograms of milk, determined with the help of the maximum of curve AR_1, in other words the intersection of MR_1 and AR_1. If the capacity of the dairy is assumed to be, for example, 10 million kilograms, the optimum capacity utilization would be 46 per cent and the dairy would then be able to return to its members an average price of 1.10 marks per kilogram for the milk received.

The curve AC_{1-n} indicates the per kilogram production cost of milk of the average cow in the members' herds at various production levels, and MC_{1-n} the corresponding marginal cost. The quantity of the annual production in thousands of kilograms is indicated above the horizontal axis. When the average price paid by the cooperative to its members is 1.10 marks and when, in striving for profit maximization, it pays to the members to expand production until marginal return and marginal cost are equal, the 4800 kilograms comes to be the most advantageous yearly output of the cow. The cow then brings for its owner a profit of 0.22 marks per kilogram of milk or a total of 1056 marks per year. In an optimum situation the number of cows of members of the dairy would in such circumstance be a total of 958. In so far as the cows would differ one way or the other from the average, in regard to their production capacity, the optimum output and profit would naturally be greater or smaller than the average. In the same way other cost factors, for example, the size of the herd, also affect the optimum, but in principle solution takes place in all member enterprises in the same way.

3. Analysis of Cooperative Integration in the Most General Market Situations

3.1. Grouping

To obtain a complete picture of the nature of cooperation it is furthermore necessary to study the behavior of the cooperative and its members in different types of market situations which for this purpose have been grouped as follows:

1. Pure competition
2. Monopolistic competition
3. Imperfect competition
   a. in marketing
   b. in production

In the first two cases the situation is considered to refer both to marketing and production. In case 3 a, the imperfection is considered to be extended only to marketing, while the production takes place under pure competition. In case 3 b, the situation is reverse as to production and marketing.

Since in this study the demand curve for the product to be marketed is supposed to be known, the differences in the demand curve in oligopoly and monopoly situations do not bring about principal problems for the analysis which would deserve separate study. Oligopoly and monopoly situations can thus be treated in the following simultaneously under the label imperfect competition.

The fact that monopolistic competition is not included in group 3 may arouse criticism. As to basis for this choice it is to be remembered that throughout the study the possibilities of obtaining profit have been used as general criterion for the grouping. Consequently monopolistic competition cannot be treated simultaneously with monopoly and oligopoly situations.

3.2. Pure Competition

By pure competition is here meant a situation in which an unlimited number of production and marketing units are represented on the market of a homogeneous product. If an equilibrium situation is assumed, no profits can then be attained in either producing or marketing units. Special attention must be drawn on this fact, generally

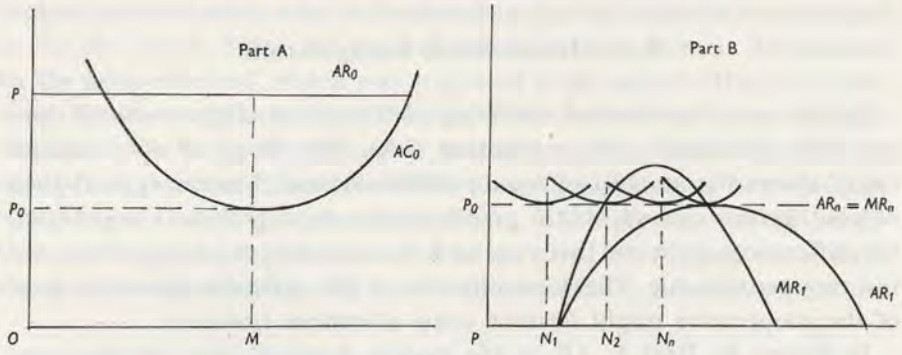

Fig. 26.

accepted in economics, because CLARK (1952) in his analysis supposes that a cooperative attains profit also under pure competition. It should, however, be remembered that under pure competition profits can be attained only if an equilibrium has not been reached or if a certain production or marketing unit is in an especially favourable position caused by, e.g., superior aptitudes of some individuals for the industry in special cases. Profits due to individual superiority or other similar reasons require, however, higher wages for the persons in question and cannot consequently be regarded as actual profits of the firm. A disequilibrium situation, the other case when profits may exist, naturally allows no further analysis. (Cf., e.g., STIGLER 1952.)

Owing to the large number of production and marketing units under pure competition, none of them has any effect upon prices, and consequently the demand elasticity of their products seems to be infinite for each of them. Thus the curve AR_0 in Figure 26, Part A, which illustrates the demand for the products of a cooperative or its average return, is horizontal. Under pure competition equilibrium can be reached solely when competing production or marketing units operate at their cost minimum, which in Figure 26, Part A, is achieved at the output level *OM*.

In Figure 26, Part B, curve AR_1 is again the average return curve, showing the average return obtainable for the members at different levels of output of the cooperative. At equilibrium the price per unit just equals the member firms' production cost. Under these circumstance the output of the first member firm is PN_1, determined by the cost minimum of average cost curve, the output of the second firm N_1N_2, of the third N_2N_3, and of the last N_3N_n. Any deviation from this state of equilibrium causes losses to the members.

3.3. Monopolistic Competition

In this case the demand elasticity of the commodity produced does not seem infinite to the marketing firm. The slope of the demand curve shows the amount of monopolistic element. Since a typical firm at equilibrium cannot obtain profits under monopolistic competition, the differences between this case and the case of pure competition are not very remarkable. The determination of the optimum operation level of the cooperative might deserve some attention, however.

In Figure 27, Part A, AR_0 is the sloping demand curve for the commodity produced and AC_0 the cost curve for the cooperative. Since no profits can be obtained at the equilibrium situation, the production cost per unit of a typical member enterprise must equal the maximum difference in the values of AR_0 and AC_0 curves, i.e. of the cost and return curves. In the Figure this is realized at the output level ON. It is to be specially noted that depending on the slope of the demand curve AR_0 the optimum output level is not reached where operation costs are at minimum. Accordingly, the maximum of the price paid to members is in this case not reached at the output OM corresponding to the minimum of the curve AC_0, but at a considerably earlier stage. This is clearly indicated in Figure 27, Part B, where the maximum of average return of the members is shown by the AR_1 curve at output level P_0N_2. The operation level of the cooperative is thus P_0N_2 and by no means P_0M, as suggested by the cost minimum, which would cause losses to all members.

In order to compare the cases of pure and monopolistic competition at equilibrium it should be supposed that the operation costs of the cooperative (AC_0), the production costs of the member firms and the

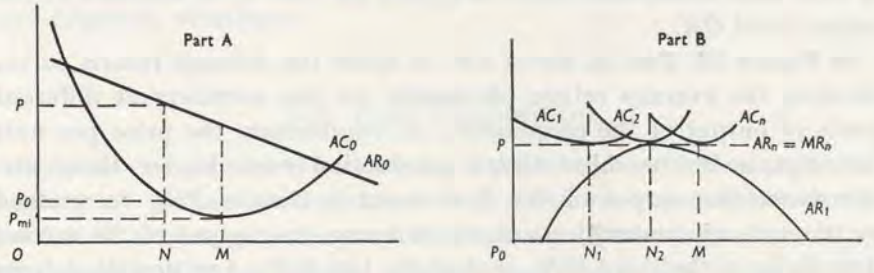

Fig. 27.

highest possible price paid to the members by the cooperative are equal in the two cases. Since the level of output in each firm is determined by the price received, which was supposed to be equal in the two cases, then (1) the output in each member firm in the two cases at equilibrium is the same. On the other hand, it can be stated that (2) the number of member firms is smaller under conditions of monopolistic competition than under pure competition. The difference in the conditions is due to the fact that, in the latter case, the cooperative always expands its operations to the extent determined by the cost minimum.

3.4. Imperfect Competition in Marketing

In order to illustrate the special character of cooperation as clearly as possible under imperfect competition, it has been found necessary to compare the behavior of a cooperative and an enterprise operating in similar conditions, especially as these conditions have obtained in many, perhaps in most, cases where farmer cooperatives have been formed.

When differences between an enterprise and a cooperative are examined, special attention should be paid to the effects that the different goals adopted by these two types of firms have upon their activities and upon the producers' behaviour. As previously stated, the independent firm strives for profit maximization, while the leading principle of a cooperative is the best interest of its members. Generally speaking, an enterprise seems to be willing to pay to the producers only as small a portion as possible of the difference which remains after deduction of the operation costs from the total return received from the sale of the output. An enterprise, accordingly, does not aim at an operation level where the difference between the average return

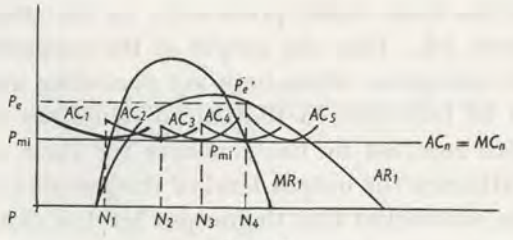

Fig. 28.

or selling price of the product and the average operation cost reaches its maximum, as does a cooperative.

Figure 28 illustrates the operation of an enterprise under the condition in question. When the producers thus operate under conditions of pure competition, the average price for the product to the producers

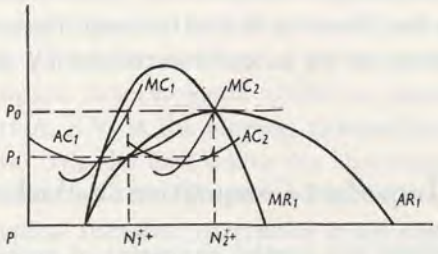

Fig. 29.

seems to the marketing enterprise to be a constant, independent of the amount bought. This constant is represented in the figure by line AC_n. The AR_1 curve shows the remainder left to the enterprise of the price per unit after deduction of operation costs or the maximum that it is able to pay to the producers per unit at different levels of output without losses. The vertical distance between the curves AR_1 and AC_n shows the profit per unit for the enterprise. AR_1 can, accordingly, be regarded as the average return curve of the enterprise and AC_n as a curve indicating the average price paid to the producer at different levels of output. Maximum profit is reached at the output level determined by the intersection of the marginal return curve MR_1 and the marginal cost curve (= marginal buying price of the product to the enterprise) MC_n. In Figure 28 the optimum level of output is PN_4 and the maximum profit is illustrated by the rectangular $P_eP_e'P_{mi}P_{mi}'$.

Figure 29 presents the behaviour of a cooperative in the same situation. The optimum output of the cooperative is determined, in accordance with what has been stated previously, on the basis of the maximum of the curve AR_1. Thus the output of the cooperative is smaller than that of the enterprise, when both are operating under same conditions. It is to be remembered that the distribution of surplus will increase the price received by the members for their product, which naturally will influence the output level of the member firms. In other words, it is to be considered that the output level of the member firms will be determined by the ultimate, not the initial price received. It is

advantageous to each member to increase production from the output level determined by the cost minimum up to the point where the marginal return calculated on the basis of the ultimate price of the product equals each member's marginal cost.

In Figure 29 the increased production of the first and second member firm is $PN_1{}^+$ and $PN_2{}^+$. As the output optimum of the cooperative is reached already at level $PN_2{}^+$, the most advantageous number of members (producers) is, in this case and generally speaking, smaller than that of an enterprise operating under the same conditions.

In the market situation studied, attention should thus be called to the following differences:

1. The optimum output of a cooperative is attained at a lower output level or degree of capacity utilization than that of an enterprise; $PN_2{}^+ < PN_4$.
2. When the producers are members of a cooperative each member firm's output is greater than when an enterprise conducts the corresponding business operations; $PN_1{}^+ > PN_1$ and $PN_2{}^+ > PN_2$.
3. When the producers are members of a cooperative they operate at a higher average cost level than when an enterprise conducts the corresponding business operations; $PP_1 > PP_{\text{mi}}$.
4. At the optimum output level of a cooperative the producers' share of the average market price of the product is greater than what it is at optimum of an enterprise; $PP_0 > PP_e$.

3.5. Imperfect Competition in Production

Under these conditions the producers are able to hold all the profits that are left after the production and operation costs are subtracted from the average selling price or average return from the commodity. This is because the elasticity of supply of the firms' business services seems to the producers to be infinite. The producers are in a position

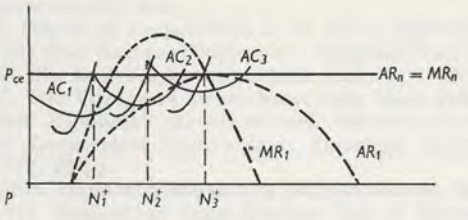

Fig. 30.

to determine the optimum level for their output independent of whether their dealer is a cooperative or an enterprise.

In Figure 30 AR_n is the supply curve for the dealers' services. The plotted curve AR_1 is the same for a particular dealer, or in other words the price that the dealer is able to pay to the producer at different levels of output. Because of the pure competition among the dealers the only possible output is $PN_3{+}$. This applies to an enterprise as much as to a cooperative.

It can now be seen that the functioning of a cooperative and its member firms in both cases of imperfect competition is quite similar. Also, it can easily be observed that when competition among the dealers is pure, no difference prevails in the functioning of enterprises and cooperatives, but under conditions of imperfect competition cooperation tends to turn the economic pressure in favour of cooperators. In this lies, perhaps, the most essential feature of cooperation as a form of economic integration.

References

AIZSILNIEKS, A. P. 1952 a. Farmer cooperatives and economic welfare—A reply. J. of Farm Economics 34, 400–403.

—— 1952 b. A final word on cooperatives. J. of Farm Economics 34, 563–566.

ANNILA, M. 1938. Lypsykarjatalouden peruskustannuksesta ja siihen vaikuttavista tekijöistä. Acta Agr. Fenn. 39, 1–115.

—— 1940. Produktionshöhe und Rentabilität des Milchviehes. Maatal. tiet. aikak. 12, 1–23.

ARESVIK, O. 1955. Comments on "Economic Nature of the Cooperative Association". J. of Farm Economics 37, 140–144.

BACKEN, H. H. & SCHAARS, M. A. 1937. The Economics of Cooperative Marketing. New York and London 1937. 583 pp.

BLACK, J. D. 1926. Introduction to Production Economics. New York 1926. 975 pp.

BOULDING, K. E. 1948. Economic Analysis. New York 1948. 884 pp.

CHAMBERLIN, E. 1950. Monopolistic Competition. Cambridge 1950. 314 pp.

CLARK, E. 1952 a. Farmer cooperatives and economic welfare. J. of Farm Economics 34, 35–51.

—— 1952 b. Farmer cooperatives and economic welfare—Rejoinder. J. of Farm Economics 34, 404–407.

EITEMAN, W. J. & GUTHRIE, G. E. 1952. The shape of the average cost curve. The American Economic Review. 42, 832–838.

EMELIANOFF, I. V. 1948. Economic Theory of Cooperation. Washington D.C. 1948. 269 pp.

FUCHS, H. 1928. Produktivgenossenschaft. Wirtschaftliche Theorie und Bedeutung der Produktivgenossenschaften. Internationales Handwörterbuch des Genossenschaftswesens. Berlin 1, 709–712.

HOLYOAKE, G. J. 1908. The History of Co-operation. London 1908. 691 pp.

JACOB, E. 1913. Volkswirtschaftliche Theorie der Genossenschaften. Berlin 1913. 401 pp.

KAARLEHTO, P. 1955. Cooperation as a form of economic integration. Acta Agr. Scand. 5, 85–97.

KAUFMANN, H. 1908. Wesen und Ziel der Konsumgenossenschaftsbewegung. Hamburg 1908. 12 pp.

LIEFMANN, R. 1921. Die Unternehmungsformen. Stuttgart 1921. 259 pp.

MELLEROWICZ, K. 1951. Kosten und Kostenrechnung. Berlin 1951. 488 pp.

MURRAY, W. G. 1953. Agricultural Finance. Ames, Iowa, 1953. 419 pp.

ÖRNE, A. 1938. Kooperativa ideer och spörsmål. Stockholm 1938. 192 pp.

PHILLIPS, R. 1953. Economic nature of the cooperative association. J. of Farm Economics 35, 74–78.

RITTER, L. S. 1953. The shape of the average cost curve: Comment. The American Economic Review 43, 621–623.

ROBOTKA, F. 1947. A theory of cooperation. J. of Farm Economics 29, 94–114.

SOMBART, W. 1930. Die drei Nationalökonomien. München und Leipzig 1930. 352 pp.

STAUDINGER, F. 1908. Die Konsumgenossenschaft. Leipzig 1908. 134 pp.

STIEGLER, G. J. 1952. The Theory of Price. New York 1952. 310 pp.

STOKDYK, E. A. 1949. Financial Structure and Policies of Cooperatives. Public Interest in the Cooperative Controversy. American Institute of Cooperation. Washington 1949. 20 pp.

SUKSELAINEN, V. J. 1938. Hankintaosuuskunta yritysmuotona. Helsinki 1938. 240 pp.

SUNDERLIN, L. K. 1947. Exemption from Income Tax of Farmers Cooperative Associations. American Institute of Cooperation. Washington 1949. 27 pp.

VALKO, L. 1954. International Handbook of Cooperative Legislation. State College of Washington 1954. 273 pp.

Osuuskuntalaki. Annettu Helsingissä 28 päivänä toukokuuta 1954. [The Finnish Cooperative Societies Act. Helsinki 1955. 126 pp.]

SOK:n Jäsenosuuskaupat. Tilastoa. Years 1925–1953. Helsinki 1926–1954.

Suomen Osuusmeijerien liiketilasto. Years 1925–1953. Helsinki 1926–1954.

Appendices

Appendix 1.

Division of surplus of the SOK member cooperative stores in patronage refund, reserves and other purposes in 1925–53[1]

Year	Number of the SOK member stores	Surplus[2]		Distributed as patronage refund		Accumulated in the reserves		Used for other purposes	
		1,000 mk	% of total turn-over	1,000 mk	%	1,000 mk	% of surplus	1,000 mk	%
1925	452	20,237	1.2	4,920	24.3	15,044	74.3	272	1.3
1926	434	23,603	1.7	6,004	25.4	17,292	73.2	306	1.3
1927	423	32,337	2.0	7,916	24.5	22,935	70.9	1,486	4.6
1928	419	42,442	2.3	10,831	25.5	29,770	70.1	1,841	4.3
1929	425	34,938	1.9	10,814	31.0	22,987	65.8	1,137	3.3
1930	423	29,120	1.7	9,524	32.7	18,774	64.4	822	2.8
1931	422	26,561	1.8	9,242	34.8	16,538	62.3	782	2.9
1932	418	24,785	1.6	9,368	37.8	14,780	59.6	636	2.6
1933	418	27,520	1.7	10,693	38.9	16,035	58.3	792	2.9
1934	417	36,673	2.0	13,454	36.7	22,251	60.7	969	2.6
1935	417	42,595	3.1	16,358	38.4	25,220	59.2	1,016	2.4
1936	416	50,249	2.2	19,769	39.3	29,712	59.1	769	1.5
1937	417	67,757	2.4	27,150	40.1	39,317	58.0	1,290	1.9
1938	417	61,531	2.0	27,286	44.3	32,252	52.4	1,993	3.2
1939	418	58,848	1.9	10,474	17.8	35,272	59.9	13,102	22.3
1940	368	91,644	2.6	27,671	30.2	55,219	60.3	8,753	9.6
1941	400	80,665	2.0	23,513	29.1	49,363	61.2	7,789	9.7
1942	411	76,615	1.7	18,197	23.8	50,712	66.2	7,706	10.1
1943	412	81,735	1.5	18,819	23.0	54,696	66.9	8,220	10.1
1944	375	74,595	1.3	17,676	23.7	49,593	66.5	7,326	9.8
1945	373	112,960	1.2	25,454	22.5	73,015	64.6	14,490	12.8
1946	370	161,560	1.0	39,562	24.5	104,784	64.9	17,214	10.7
1947	372	190,227	0.8	45,728	24.0	129,671	68.2	14,828	7.8
1948	374	238,516	0.6	66,117	27.7	158,570	66.5	13,829	5.8
1949	374	260,878	0.6	78,737	30.2	163,767	62.8	18,374	7.0
1950	376	360,388	0.7	121,979	33.8	209,914	58.2	28,495	7.9
1951	379	420,288	0.6	169,152	40.2	229,565	54.6	21,571	5.1
1952	377	334,240	0.5	147,964	44.3	174,461	52.2	11,815	3.5
1953	376	306,818	0.4	143,627	46.8	156,995	51.2	6,196	2.0

[1] Source: *SOK:n jäsenosuuskaupat, Tilastoa*, 1925–53 (The SOK Member Cooperative Stores, Statistics, 1925–53).

[2] To get the actual surplus the interest on capital equities has been deducted from the total surplus given in the statistics.

Appendix 2.

The relative significance of fixed assets, current assets and inventories in the total capital in the SOK member cooperative stores in 1925–53[1]

Year	Number of the SOK member stores	Current assets 1,000 mk	% of the total capital investment	Inventories 1,000 mk	% of the total capital investment	Fixed assets 1,000 mk	% of the total capital investment
1925	452	54,561	12.3	271,343	61.3	112,149	25.3
1926	434	63,684	13.1	295,200	60.7	125,634	25.8
1927	423	86,742	15.6	315,602	56.6	153,007	27.4
1928	419	89,639	13.2	384,412	56.5	204,919	30.1
1929	425	109,923	14.7	391,755	52.3	245,694	32.8
1930	423	99,453	13.3	377,069	50.6	265,223	35.6
1931	422	82,876	11.2	378,702	51.3	273,051	37.0
1932	418	95,414	13.5	335,743	47.6	269,138	38.1
1933	418	102,965	14.6	329,457	46.6	269,701	38.1
1934	417	106,753	14.5	347,353	47.2	278,863	37.9
1935	417	118,512	14.9	378,449	47.7	295,311	37.2
1936	416	141,805	15.6	424,381	46.7	342,272	37.7
1937	417	164,048	15.0	518,108	47.5	408,022	37.4
1938	417	168,942	13.3	591,482	46.6	508,489	40,0
1939	418	245,373	18.8	529,066	40.5	523,434	40.1
1940	368	247,274	18.9	547,649	41.8	512,927	39.1
1941	400	319,009	21.2	586,121	38.9	585,719	38.9
1942	411	370,663	21.3	694,509	39.8	675,961	38.8
1943	412	401,471	20.2	883,727	44.6	697,619	35.2
1944	375	505,897	27.6	705,673	38.4	617,901	33.7
1945	373	587,182	22.6	1,293,789	49.9	692,439	26.7
1946	370	711,679	18.2	2,067,137	52.8	1,131,673	28.9
1947	372	877,950	16.4	2,882,927	53.9	1,584,203	29.6
1948	374	1,036,634	12.1	5,113,076	59.7	2,411,165	28.2
1949	374	1,160,892	10.9	6,131,123	57.6	3,343,626	31.4
1950	376	1,306,652	10.1	6,802,491	52.7	4,791,816	37.1
1951	379	1,831,811	10.0	9,835,523	53.5	6,700,814	36.5
1952	377	2,080,545	9.4	11,091,120	50.3	8,878,016	40.3
1953	376	2,476,279	10.9	10,258,702	45.0	10,033,998	44.1

Appendix 3.

The relative significance of different sources of capital used in the SOK member cooperative stores in 1925–53[1]

Year	Number of the SOK member stores	Liabilities to members 1,000 mk	% of the total capital investment	Liabilities to outsiders 1,000 mk	% of the total capital investment	Net worth 1,000 mk	% of the total capital investment
1925	452	104,380	23.6	231,442	52.3	106,964	24.1
1926	434	135,608	27.9	226,687	46.6	124,290	25.5
1927	423	190,451	34.2	213,932	38.4	152,878	27.4
1928	419	212,831	31.3	281,625	41.4	185,386	27.3
1929	425	234,872	31.4	304,238	40.6	209,409	28.0
1930	423	236,147	31.7	283,644	38.1	225,396	30.2
1931	422	220,142	29.8	280,596	38.0	238,065	32.2
1932	418	208,616	29.5	248,202	35.2	249,185	35.3
1933	418	217,030	30.7	228,071	32.2	262,156	37.1
1934	417	234,923	31.9	217,404	29.6	283,314	38.5
1935	417	253,683	32.0	230,592	29.1	308,793	38.9
1936	416	285,372	31.4	282,489	31.1	341,123	37.5
1937	417	353,986	32.5	350,608	32.2	385,752	35.4
1938	417	387,619	30.5	462,821	36.5	419,061	33.0
1939	418	364,025	27.9	504,667	38.7	436,100	33.4
1940	368	347,310	26.5	496,580	37.9	466,932	35.5
1941	400	379,702	25.2	580,071	38.5	545,982	36.3
1942	411	450,093	25.8	699,847	40.2	593,430	34.0
1943	412	555,769	28.0	787,196	39.7	640,362	32.3
1944	375	587,860	32.1	625,672	34.2	621,692	33.6
1945	373	848,996	33.0	1,037,326	40.3	708,133	26.7
1946	370	948,492	24.2	1,914,985	49.0	1,049,962	26.8
1947	372	1,202,054	22.5	2,976,121	55.7	1,171,350	21.8
1948	374	1,600,594	18.7	5,634,675	65.8	1,325,606	15.5
1949	374	1,908,395	17.9	7,264,169	68.3	1,463,077	13.8
1950	376	2,400,955	18.6	8,769,497	68.0	1,730,507	13.4
1951	379	3,991,838	21.7	12,291,222	66.9	2,085,088	11.4
1952	377	5,145,164	23.3	14,628,241	66.3	2,276,276	10.3
1953	376	5,755,046	25.3	14,525,202	63.8	2,488,731	10.9

Appendix 4.

The relative significance of liabilities and net worth in the total financing cost in the SOK member cooperative stores in 1925–53[1]

Year	Number of the SOK member stores	Paid interest		Liabilities 1,000 mk	Net worth 1,000 mk	Calculated interest on net worth, % of turnover
		1,000 mk	% of turnover			
1925	452	23,212	1.79	335,822	106,964	0.57
1926	434	24,377	1.76	362,295	124,290	0.60
1927	423	26,401	1.65	404,383	152,878	0.62
1928	419	29,735	1.63	494,456	185,386	0.61
1929	425	35,444	1.89	539,110	209,409	0.73
1930	423	37,965	2.18	519,791	225,396	0.95
1931	422	32,677	2.17	500,738	238,065	1.03
1932	418	23,945	1.56	456,818	249,185	0.85
1933	418	20,761	1.25	445,101	262,156	0.74
1934	417	17,952	0.99	452,327	283,314	0.62
1935	417	17,580	0.89	484,275	308,793	0.57
1936	416	18,866	0.84	567,861	341,123	0.50
1937	416	21,553	0.76	704,594	385,752	0.42
1938	417	25,706	0.85	850,440	419,061	0.42
1939	418	26,940	0.84	868,692	436,100	0.42
1940	368	22,029	0.62	843,890	466,932	0.34
1941	399	23,323	0.58	959,773	545,982	0.33
1942	410	22,790	0.51	1,149,940	593,430	0.26
1943	412	29,194	0.53	1,342,965	640,362	0.26
1944	374	27,840	0.50	1,213,532	621,692	0.26
1945	372	29,681	0.31	1,886,322	708,133	0.12
1946	370	60,726	0.36	2,863,477	1,049,962	0.13
1947	372	140,418	0.60	4,178,175	1,171,350	0.17
1948	374	352,739	0.95	7,235,269	1,325,606	0.17
1949	374	509,169	1.24	9,172,564	1,463,077	0.20
1950	376	679,661	1.31	11,170,452	1,730,507	0.20
1951	379	1,116,690	1.69	16,283,060	2,085,088	0.22
1952	377	1,273,096	1.73	19,773,405	2,276,276	0.20
1953	376	1,382,281	1.88	20,280,248	2,488,731	0.23

Appendix 5.

Division of net worth in the SOK member cooperative stores in capital equities, reserves and surpluses[1]

Year	Number of the SOK member stores	Capital equities		Reserves		Surpluses	
		1,000 mk	% of net worth	1,000 mk	% of net worth	1,000 mk	% of net worth
1925	452	6,615	6.2	79,225	74.1	21,124	19.7
1926	434	6,565	5.3	93,362	75.1	24,363	19.6
1927	423	8,056	5.3	111,746	73.1	33,076	21.6
1928	419	8,530	4.6	133,592	72.1	43,264	23.3
1929	425	9,104	4.3	163,634	78.2	36,634	17.5
1930	423	9,359	4.2	185,502	82.3	30,535	13.5
1931	422	9,339	3.9	200,807	84.4	27,919	11.7
1932	418	9,432	3.8	213,999	85.9	25,754	10.3
1933	418	9,430	3.6	224,677	85.7	28,049	10.7
1934	417	9,398	3.3	236,792	83.6	37,124	13.1
1935	417	9,644	3.1	256,119	83.0	43,030	13.9
1936	416	9,900	2.9	280,502	82.2	50,721	14.9
1937	417	10,226	2.7	307,255	79.6	68,271	17.7
1938	417	10,712	2.6	346,285	82.6	62,064	14.8
1939	418	10,759	2.5	363,677	83.4	61,664	14.1
1940	368	10,411	2.2	364,291	78.0	92,230	19.8
1941	400	11,880	2.2	452,854	82.9	81,248	14.9
1942	411	12,598	2.1	503,488	84.9	77,344	13.0
1943	412	13,361	2.1	544,524	85.0	82,477	12.9
1944	375	13,292	2.1	533,166	85.8	75,234	12.1
1945	373	14,901	2.1	579,210	81.8	114,022	16.1
1946	370	19,031	1.8	868,396	82.7	162,535	15.5
1947	372	21,616	1.8	957,073	81.7	192,661	16.5
1948	374	32,359	2.4	1,062,530	80.2	230,717	17.4
1949	374	57,310	3.9	1,194,427	81.6	211,340	14.5
1950	376	91,586	5.3	1,330,834	76.9	308,087	17.8
1951	379	150,534	7.2	1,526,898	73.2	407,656	19.6
1952	377	202,005	8.9	1,826,858	80.2	247,413	10.9
1953	376	262,684	10.6	1,963,463	78.9	262,584	10.5

Appendix 6.

The write-offs percentage as compared to the surplus percentage in the SOK member cooperative stores in 1925–53[1]

Year	Number of the SOK member stores	Value of fixed assets and inventories 1,000 mk	Write-offs from fixed assets and inventories		Turnover 1,000 mk	Surplus	
			1,000 mk	%		1,000 mk	% of turnover
1925	452	99,271	5,688	5.7	1,295,597	20,237	1.56
1926	434	108,558	5,874	5.4	1,385,273	23,603	1.70
1927	423	129,171	8,917	6.9	1,598,073	32,337	2.02
1928	419	150,451	11,785	7.8	1,824,685	42,442	2.33
1929	425	187,243	10,343	5.5	1,880,007	34,938	1.86
1930	423	200,969	9,939	4.9	1,738,740	29,120	1.67
1931	422	209,330	9,288	4.4	1,506,761	26,561	1.76
1932	418	215,714	9,395	4.4	1,538,340	24,785	1.61
1933	418	222,656	12,056	5.4	1,656,857	27,520	1.66
1934	417	229,887	17,305	7.5	1,807,866	36,673	2.03
1935	417	249,269	20,445	8.2	1,984,569	42,595	2.15
1936	416	286,410	24,109	8.4	2,254,426	50,249	2.23
1937	417	342,433	32,237	9.4	2,823,466	67,757	2.40
1938	417	425,964	25,938	6.1	3,034,402	61,531	2.03
1939	418	459,415	37,295	8.1	3,208,379	61,140	1.91
1940	368	427,203	48,505	11.4	3,555,823	91,644	2.58
1941	400	463,613	34,171	7.4	4,020,215	80,665	2.01
1942	411	534,113	39,112	7.3	4,436,701	76,615	1.73
1943	412	574,812	40,418	7.0	5,522,648	81,735	1.48
1944	375	489,363	37,414	7.6	5,541,793	74,595	1.35
1945	373	584,390	49,538	8.5	9,385,280	112,960	1.20
1946	370	1,058,827	84,683	8.0	16,872,290	161,560	0.96
1947	372	1,474,754	101,478	6.9	23,590,831	190,227	0.81
1948	374	2,284,341	132,927	5.8	36,955,275	238,516	0.65
1949	374	3,168,548	174,740	5.5	41,008,220	260,878	0.64
1950	376	4,433,188	214,926	4.8	52,007,258	360,388	0.69
1951	379	6,239,221	286,475	4.6	66,115,875	420,288	0.64
1952	377	8,265,073	328,773	4.0	73,557,052	334,240	0.45
1953	376	9,142,472	396,387	4.3	73,344,837	306,818	0.42

Appendix 7.

The relative significance of net worth and liabilities in the total capital of the Valio member cooperative dairies in 1925–53[1]

Year	Number of the Valio member dairies	Capital equities		Reserves		Surplus		Liabilities	
		1,000 mk	% of total capital	1,000 mk	% of total capital	1,000 mk	% of total capital	1,000 mk	% of total capital
1925	431	8,462	5.8	50,750	34.4	7,807	5.3	80,363	54.5
1926	458	10,160	5.5	63,359	34.6	5,634	3.1	104,103	56.8
1927	513	11,854	5.9	72,844	36.1	6,396	3.2	110,332	54.8
1928	530	14,475	6.0	86,473	35.9	6,512	2.7	133,402	55.4
1929	564	15,709	6.0	99,242	37.7	5,660	2.2	142,341	54.1
1930	589	17,966	6.6	112,253	41.1	2,764	1.0	142,666	52.3
1931	608	22,589	8.0	119,051	42.0	4,457	1.6	137,264	48.4
1932	603	23,738	8.8	126,503	47.1	4,425	1.7	113,780	42.4
1933	607	26,922	9.9	137,575	50.3	5,583	2.0	103,386	37.8
1934	599	27,604	10.0	148,255	53.7	5,265	1.9	95,153	34.4
1935	609	29,070	9.5	171,227	56.2	7,811	2.6	96,427	31.7
1936	604	29,916	9.2	186,931	57.7	5,828	1.8	101,522	31.3
1937	616	31,412	8.7	203,485	56.5	7,459	2.1	118,023	32.7
1938	613	31,974	8.1	222,594	56.4	8,242	2.1	131,535	33.4
1939	509	29,611	7.2	236,380	57.4	8,442	2.0	137,367	33.4
1940	479	29,409	6.7	255,204	58.4	9,466	2.2	143,064	32.7
1941	462	29,402	6.8	261,069	60.5	6,076	1.4	135,335	31.3
1942	451	29,429	6.7	267,733	61.1	5,942	1.4	134,943	30.8
1943	488	28,945	5.8	286,886	57.0	10,031	2.0	176,943	35.2
1944	458	28,971	5.7	303,599	58.7	8,853	1.7	175,325	33.9
1945	440	29,455	4.3	341,217	50.2	14,032	2.1	294,816	43.4
1946	438	36,105	3.7	283,274	28.8	23,206	2.4	639,738	65.1
1947	387	37,987	2.7	330,062	23.8	33,200	2.4	989,131	71.1
1948	403	53,249	2.7	394,995	20.2	40,065	2.0	1,469,319	75.1
1949	393	89,563	3.5	449,212	17.3	41,812	1.6	2,007,947	77.6
1950	387	115,968	3.0	513,529	13.5	55,417	1.4	3,151,656	82.1
1951	382	177,625	3.1	606,203	10.4	74,077	1.3	4,946,647	85.2
1952	374	404,912	5.1	698,327	8.8	75,363	0.9	6,782,077	85.2
1953	357	586,745	6.3	759,473	8.2	70,512	0.8	7,856,171	84.7

Appendix 8.

The relative significance of non-members in the operations of the Valio member cooperative dairies in 1925–53[3]

Year	Number of the Valio member dairies	Number of members	Number of members' cows (equities)[4]	Number of non-members	Number of non-members' cows	Non-members' cows, % of all cows
1925	602	61,223	383,078			
1926	644	65,393	407,168			
1927	664	68,092	417,928			
1928	613	67,363	411,700	10,459	35,578	8.0
1929	642	70,675	427,597	13,171	44,261	9.4
1930	664	73,198	438,048	16,314	57,060	11.5
1931	679	75,295	450,891	16,854	59,802	11.7
1932	672	75,881	452,643	16,575	57,445	11.3
1933	675	75,629	452,579	15,833	56,141	11.0
1934	660	74,569	445,553	15,658	54,134	10.8
1935	663	74,536	447,043	15,935	53,408	10.7
1936	646	75,164	447,868	18,109	63,569	12.4
1937	658	76,505	455,203	20,395	73,902	14.0
1938	662	78,166	465,860	24,230	91,952	16.5
1939	664	80,001	477,063	25,990	98,481	17.1
1940	541	73,015	441,430	23,529	88,780	16.7
1941	506	70,570	425,189	19,347	70,691	14.3
1942	504	70,513	420,551	19,230	68,545	14.0
1943	546	72,471	426,407	22,891	83,229	16.3
1944	491	70,131	415,965	26,457	90,654	17.9
1945	483	69,931	414,594	26,332	91,463	18.1
1946	495	70,624	378,175		95,579	20.2
1947	432	67,991	377,876		103,212	21.5
1948	432	68,708	372,545		115,454	23.7
1949	427	72,615	384,501		150,812	28.2
1950	414	76,646	389,835		170,359	30.4
1951	412	82,697	413,561		193,553	31.9
1952	392	88,097	417,189		186,566	30.9
1953	369	94,725	427,264		169,368	28.4

[3] Source: Suomen osuusmeijerien liiketilasto, 1925–53 (Business Statistics of Cooperative Dairies in Finland, 1925–53).

[4] Until 1945 the number of equities has been used to represent the number of members' cows.

Appendix 9.

Correlation between the non-members' share of the business turnover and the percentage of refund in certain SOK member cooperative stores in 1936–38 and 1951–53[1]

Year	Number of coop. stores	Refund percentage	Share of non-members, per cent	Year	Number of coop. stores	Refund percentage	Share of non-members, per cent
1936	51	1.0	49.6	**1937**	2	0.5	33.4
	1	1.4	64.6		50	1.0	54.5
	27	1.5	52.9		1	1.2	54.9
	1	1.7	37.4		24	1.5	49.2
	64	2.0	42.5		65	2.0	41.1
	13	2.5	26.6		12	2.5	31.6
	1	2.6	47.8		1	2.6	39.4
	25	3.0	40.1		1	2.9	37.4
	2	3.5	14.7		24	3.0	42.4
	11	4.0	32.4		1	3.5	38.6
	1	4.5	39.4		12	4.0	33.5
	4	5.0	28.3		6	5.0	33.3
	1	5.5	32.5		4	6.0	42.2
	4	6.0	37.6		2	7.0	38.3
	1	8.0	19.4				
1938	53	1.0	51.6	**1951**	39	0.5	52.6
	1	1.2	79.7		2	0.6	68.2
	31	1.5	55.8		5	0.7	52.3
	76	2.0	43.8		2	0.8	74.0
	9	2.5	25.7		2	0.8	71.4
	1	2.6	32.1		172	1.0	68.4
	23	3.0	35.6		15	1.5	62.6
	1	3.5	14.4		4	2.0	74.4
	7	4.0	40.7		1	3.0	72.1
	5	5.0	34.3				
	3	6.0	44.5				
1952	1	0.3	45.5	**1953**	1	0.3	64.9
	2	0.4	52.2		2	0.4	42.2
	71	0.5	64.2		73	0.5	62.8
	1	0.6	51.7		4	0.6	50.3
	1	0.6	82.5		7	0.7	48.7
	5	0.7	59.4		5	0.8	53.2
	8	0.8	58.4		2	0.8	59.2
	5	0.8	66.9		91	1.0	64.7
	1	0.9	74.0		4	1.5	71.0
	112	1.0	66.4		2	2.0	86.4
	5	1.5	70.0		1	3.0	44.8
	3	2.0	81.6				

Appendix 10.

The share of business transactions of non-members in certain SOK member cooperative stores in 1930–53[1]

Year	Number of the SOK member stores included	Refund 1,000 mk	Capitalized refund 1,000 mk	Average refund, percentage	Turnover 1,000 mk	Percentage of capitalized refund of turnover (equals the share of members)
1930	214	9,328	566,986	1.6	948,139	59.8
1931	224	9,074	516,398	1.8	900,263	57.4
1932	226	9,247	512,347	1.8	909,170	56.3
1933	246	10,140	567,357	1.8	1,058,446	53.6
1934	260	13,149	698,502	1.9	1,219,284	57.3
1935	299	15,859	822,985	1.9	1,464,201	56.9
1936	319	19,205	979,503	2.0	1,828,512	53.6
1937	356	26,841	1,368,449	2.0	2,498,031	54.8
1938	356	26,775	1,368,209	2.0	2,624,263	52.1
1939	165	10,474	658,370	1.6	1,305,848	50.4
1940	300	27,671	1,463,947	1.9	2,931,766	49.9
1941	270	23,522	1,363,900	1.7	3,091,682	44.1
1942	246	17,815	1,180,140	1.5	3,068,469	38.5
1943	239	18,726	1,252,389	1.5	3,741,061	33.5
1944	224	17,676	1,216,755	1.5	3,889,890	31.3
1945	214	24,011	1,751,950	1.4	6,565,998	26.7
1946	209	35,165	2,909,433	1.2	11,872,573	24.5
1947	198	45,496	4,405,417	1.0	15,165,487	29.0
1948	186	65,933	6,582,086	1.0	21,151,468	31.1
1949	193	77,543	8,325,543	0.9	26,157,451	31.8
1950	230	121,265	11,956,869	1.0	37,762,760	31.7
1951	251	168,806	17,234,637	1.0	50,686,109	34.0
1952	236	147,901	17,491,620	0.8	52,009,065	33.6
1953	211	144,430	17,789,527	0.8	48,688,324	36.5

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