



Factors Critical to the Success or Failure of Emerging Agricultural Cooperatives

Richard J. Sexton and Julie Iskow

Department of Agricultural and Resource Economics
University of California, Davis



Giannini Foundation Information Series No. 88-3

June 1988

The Giannini Foundation Information Series, initiated in 1963, publishes reports of timely interest for specific readerships. Reports are numbered serially within years. Single copies of this report may be ordered free of charge from Agriculture and Natural Resources Publications, 6701 San Pablo Ave., Oakland, CA 94608. Order by report number (Information Series 88-3).

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The recently established University of California Center for Cooperatives provided the funding for this publication in order to further understanding of cooperatives.

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FACTORS CRITICAL TO THE SUCCESS OR FAILURE OF EMERGING AGRICULTURAL COOPERATIVES

the authors are:

Richard J. Sexton
Assistant Professor

Julie Iskow
Postgraduate Research Economist
Department of Agricultural Economics
University of California, Davis

ACKNOWLEDGEMENTS

This report is an outcome of a cooperative work agreement between the University of California, Davis and the Agricultural Cooperative Service, U.S. Department of Agriculture. Funding was provided by USDA, ACS, under the terms of research agreement No. 58-3J31-5-0014. Many people contributed to the completion of the project and this report in particular. The authors are particularly grateful to John Haas and William Seymour at ACS for their patience and encouragement and to the many land-

grant university economists, Bank for Cooperatives officials, and state agricultural council leaders who helped in locating recently-formed cooperatives. We are especially indebted to the many leaders of new cooperatives who shared their experiences and viewpoints with us and to Christina Fitz Gibbon for timely processing of this report.

The views expressed here are the authors' and do not necessarily represent those of the USDA or any other agency.

Funding for this project was provided by the U.S. Department of Agriculture, Agricultural Cooperative Service under the terms of research agreement No.58-3J31-5-0014. The views expressed here are the authors' and do not necessarily represent the viewpoint of the U.S. Department of Agriculture or any other agency.

TABLE OF CONTENTS

PREFACE	iv
HIGHLIGHTS	iv
INTRODUCTION	1
PART 1. THE ECONOMIC ROLE OF COOPERATIVES IN MARKET-ORIENTED ECONOMIES	2
I. The Economic Essence of a Cooperative	2
II. When Is Vertical Integration Desirable?	4
A. Margin reduction	5
B. Market power avoidance	7
C. Using marketing cooperatives to influence consumer price	12
D. Risk reduction through cooperatives	13
E. Cooperation in markets where no alternative market opportunity exists	15
III. Summary	18
PART 2. THE ORGANIZATIONAL, FINANCIAL, AND OPERATIONAL KEYS TO DEVELOPING A SUCCESSFUL COOPERATIVE	19
I. Organizational Keys to Success	19
A. Membership	19
1. Developing the initial coalition	19
2. Building the membership	19
3. Long-term membership policy	21
4. Nonmember business	22
B. Optimal vertical integration in a cooperative	23
C. Decision making	23
1. Voting	23
2. Management	24
II. Financial Keys to Success	25
A. Generating initial equity	25
B. On-going equity acquisition and redemption	26
C. Debt finance	27
D. Use of grants and technical assistance	29
III. Operational Keys to Success	30
A. Pricing policy	30
B. Output policy	31
C. Evaluating a cooperative's performance	32
IV. Summary	33

TABLE OF CONTENTS

PART 3. AN EXPLORATORY ANALYSIS OF RECENTLY-FORMED AMERICAN AGRICULTURAL COOPERATIVES	34
I. Identifying Newly-Formed American Agricultural Cooperatives	34
II. The Survey Instrument	34
III. The Main Results	35
A. Characteristics of the survey respondents	35
B. Economic factors	35
C. Membership factors	37
D. Financing	38
E. Decision making and management	39
IV. Statistical Analysis of the Determinants of Success in Emerging Agricultural Cooperatives	41
A. The success ratings	41
B. A statistical model of the determinants of success	41
1. Constructing a measure of success	41
2. Variable selection	42
3. Results	42
V. Summary	45
CONCLUSIONS	46
SURVEY FORM SENT TO ACTIVE MARKETING COOPERATIVES	47

PREFACE

This report studies the determinants of success or failure among recently formed American agricultural cooperatives. It is intended to assist farm leaders and their advisors in making decisions concerning new cooperative ventures.

Focus is given to economic environments in which a cooperative may improve farmers' welfare and to the organizational, financial, and operational requisites to establishing a successful cooperative. It is assumed that readers have some basic understanding of the key principals and concepts of cooperatives.

HIGHLIGHTS

Cooperatives play an important role in America's agricultural economy. However, the failure rate among new cooperatives is often high and, moreover, situations where cooperatives could benefit farmers may sometimes go unrecognized. This study was undertaken to provide a guide to the types of economic conditions in which cooperatives can be beneficial and to set forth the key organizational, financial, and operational features to developing a successful cooperative. In this sense the report is intended to act as a blueprint to guide farm leaders and their advisors in making decisions concerning new cooperatives.

In Part 1 of the report the key economic functions of cooperatives are described and the market conditions amenable to a cooperative's presence are set forth. Cooperatives are an organization through which farmers may address market failure by jointly vertically integrating themselves into the market chain. As a consequence of market failure, farmers may pay too much for farm supplies or receive too little for farm product sales. They may also be exposed to excessive price and income risk or be unable to buy or sell all of the products they wish. This report

shows how to recognize market conditions under which one or more of these problems may occur and how the problems may be overcome through a cooperative.

Part 2 of the report focuses on the organizational, financial, and operational keys to successfully developing a cooperative, given that one is needed based on the market conditions as described in Part 1. Among the factors discussed in Part 2, particular stress is given to insufficient membership and business volume and to a poor initial equity base as critical problems for new cooperatives. Several suggestions to help overcome these and other problems are presented.

Part 3 of the report analyzes the experiences of 61 recently-organized American agricultural cooperatives. These cooperatives present a wide diversity of outcomes ranging from major success to minor success to failure. Statistical analysis isolates several factors critical to the successful cooperatives' performance including the initial involvement of a large number of members, growth in the membership, use of full-time professional management, and acceptance of nonmember business.

INTRODUCTION

This report is about the causes of success or failure of emerging agricultural cooperatives in the United States and its protectorates. Because cooperatives are voluntary organizations, they will succeed only if they provide benefits to their members in excess of what is available elsewhere. An often-used phrase is that cooperatives "must be born of necessity." Accordingly, a major focus of this report is the benefits cooperatives can possibly provide in a market-oriented economy. Although membership in a cooperative may provide intangible benefits such as satisfaction from participation in a democratic organization, our focus will be on the economic benefits of cooperation.

Even cooperatives that are born of necessity may fail if they lack sufficient membership and volume, are improperly financed, or are poorly managed. Consequently a second focus of this report is the organizational, financial, and operational requisites to the successful development of a new cooperative. We should stress at the outset, however, that this report is not intended to be a "how to" guide on the mechanics of starting a cooperative.¹

Cooperatives have played a fundamental role in the development of America's agriculture. That role has increased in importance through the twentieth century to where about 30 percent of farm products are now marketed through cooperatives at the first-handler or farm-gate level and 27 percent of farm supplies are purchased from cooperatives.

However, cooperatives' overall share of the agricultural economy has not increased in the 1980s. Moreover, decline has been noted in recent years in the number of new agricultural cooperatives being formed, and the failure rate among those that have been organized has been high. This report is, therefore, timely in that cooperatives have been a traditional means of self help for farmers, particularly during times of economic hardship like many farmers have been experiencing during the 1980s.

This study has three main components. Part 1 reports on the results of recent research into the possible economic benefits of cooperatives in a modern, market-oriented economy, while Part 2 focuses on the organizational, financial and operational keys to development of a successful cooperative. Taken as a whole, Parts 1 and 2 provide a loose "blueprint" for success in new modern-day agricultural cooperatives.

Part 3 of the study reports on results of a survey of agricultural cooperatives formed within the last 15 or so years in the U.S. and its protectorates. Leaders of these cooperatives were asked to complete a questionnaire designed to discern the economic factors motivating the cooperative's inception and the organizational, financial, and operational keys to its subsequent success or failure.

¹A publication devoted to this task is Gene Ingalsbe and James L. Goff, *How to Start a Cooperative*, Cooperative Information Report No. 7, U.S. Department of Agriculture, Agricultural Cooperative Service, 1985.

PART 1. THE ECONOMIC ROLE OF COOPERATIVES IN MARKET-ORIENTED ECONOMIES

In this part of the report, we first identify the key economic functions performed by cooperatives in our economy, and then proceed to enumerate and discuss the specific benefits that cooperatives may be able to provide to members. In each instance we first describe the potential benefit and then indicate how to identify the specific market conditions where the benefit can be realized.

I. The Economic Essence of a Cooperative.

Cooperatives are oftentimes misunderstood. In part, confusion has been caused by people's desire to impart social or political connotations to cooperatives. However, the overriding significance of cooperatives, especially to American farmers struggling to succeed in today's economy, is as an economic organization.

The basic characteristic that distinguishes cooperatives from other businesses is that they are owned, controlled by, and intended to benefit the people they serve—the members—rather than outside investors. However, the feature of member control does not distinguish cooperatives from many other diverse organizations including labor unions, country clubs, and governmental units.

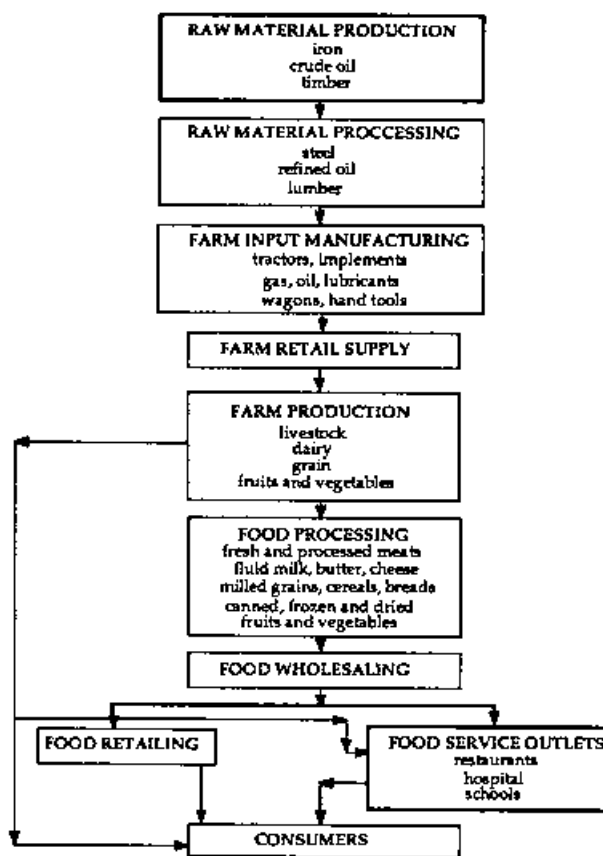
The additional concept needed to set cooperatives apart from other organizations and to understand their role in the economy is *vertical integration*. In turn, to understand vertical integration it helps to think of a production process flowing like a river beginning with the mining of raw materials and ending finally at the consumer. The outputs of each successive stage in the production flow are, in turn, inputs into the next stage and so on.

If a business operating at one stage in the process decides to extend its operations into additional stages of the process, we say the business has vertically integrated. *Downstream or forward integration* is when a firm moves into production stages closer to consumers, like the oil refiner who owns a pipeline distribution network and possibly a chain of retail gas stations. *Upstream or backward integration* is when a business supplies its own productive inputs such as a refiner who owns crude oil reserves and a distribution network to transport oil to its refineries.

Figure 1 schematically depicts a typical pattern of the production flow for agricultural commodities and lists examples of products produced at the various stages. Just as the oil refiner in our previous

illustration sometimes found it desirable to integrate its operation upstream and/or downstream into the product flow, the agricultural producers depicted in the middle of Figure 1 may have a similar incentive to vertically integrate. We will soon enumerate and

Figure 1. A Typical Market Flow for Agricultural Production



discuss these incentives, but for now accept that farmers may on the upstream side wish to become involved in producing and retailing the fuel, fertilizer, chemicals and other inputs that they use in their farm operations. On the downstream side they may have incentive to market their own production including possible ownership of processing facilities and transportation equipment.

However, most agricultural producers would encounter a fundamental problem in attempting to vertically integrate: building a processing plant for a single producer's output would almost never be efficient. That is, the minimum size of operation

needed to efficiently operate, for example, a processing plant almost certainly will exceed the scale of the farming operation by a vast magnitude. Moreover, a single grower would usually not have the financial capacity to set up an efficient plant.

The solution to this dilemma is for many producers to integrate jointly, to band together to build or purchase the processing plant. This action of *joint vertical integration* is the economic essence of a cooperative. Stated in terms of a definition, *agricultural cooperation represents coordination of producers to achieve mutual vertical integration*. That is, by banding together in a cooperative, farmers who each have incentive to vertically integrate can jointly overcome the vast scale discrepancies that normally will exist between the farm sector and the upstream or downstream industries. When farmers integrate downstream, they form a *marketing cooperative*, while joint upstream integration results in a *purchasing or supply cooperative*.

Table 1 illustrates this point using data from the late 1970s for a sample of food processing industries. It compares the minimum level of sales needed to attain efficient scale in the industry with the average level of sales for farmers selling to the industry. Most noteworthy is the final column of the table which indicates how many average-size farms are needed to supply the minimum efficient-size plant.² For example, the output of over 2,000 average-size livestock producers would be needed to supply the minimum efficient-size meat packing plant. In other words, farmers in these industries would not on their own be able to efficiently integrate into the processing of their raw agricultural products. But if they were to band together through a cooperative in approximately the numbers indicated on the table, they could jointly run an efficient processing plant.

Table 1. Farm Size and Efficient Processing Plant Size Comparisons for Selected Industries

Processing industry	1977 value of shipments in millions of dollars	1977 value of shipments for minimum efficient plant scale in thousands of dollars	Farm industry	1978 average sales per farm in thousands of dollars	Number of average farms per minimum efficient plant
Meat packing	31,130	102,700	Livestock except dairy and poultry	32.2	2,153
Creamery butter	1,110	14,300	Dairy	70.3	153
Cheese	5,246	33,000	Dairy	70.3	325
Canned fruits and vegetables	6,321	457,000	Vegetables and melons	87.3	1,635
	6,321	457,000	Fruit and tree nuts	49.9	2,862
Flour	4,569	33,800	Wheat	30.2	616
Milled rice	1,242	64,000	Rice	129.7	333
Raw cane sugar	708	10,000	Sugar	187.9	32
Soybean oil mills	6,117	102,700	Soybeans	32.0	3,721

Sources: Processing industry data are adapted from Conner, J. M., *et al.*, *The Food Manufacturing Industries*, Lexington, Mass: D. C. Heath & Co., 1985; Farm industry data are from the 1978 *Agricultural Census*.

²These figures were obtained by adjusting the sales from the average farm by a conversion factor to reflect the farm-processing price spread and then dividing sales for the minimum efficient-size plant by the adjusted sales for the average farm in that industry.

II. When Is Vertical Integration Desirable?

It is now time to operationalize the notion that cooperatives must be "born of necessity." The key task lies in discerning when vertical integration is a good idea.

To begin, economic exchange can always be handled in one of two basic ways: at arm's length through a market or internally through a firm. Vertical integration is desirable when a transaction is more efficiently handled through the internal workings of a firm than through the market.

However, under certain conditions, markets will always be the most effective way to transact business. Markets that satisfy these conditions are called *competitive markets*. The key characteristics of competitive markets are:

1. They contain a large number of both buyers and sellers.
2. Firms are free to enter or leave these markets without penalty.
3. All firms within a market produce the same product, i.e., there is no product differentiation.
4. Traders in the market possess all information. For example, everyone knows the price(s) being offered or charged.

When farmers buy or sell in markets that tend to satisfy these four characteristics, they can be assured of receiving the highest price possible for the products they sell and paying the lowest price possible for the farm supplies they buy. Vertical integration cannot improve upon the performance of these "perfect" markets and farmers have no incentive to form cooperatives in these instances.

However, most actual markets do not satisfy all of the competitive market characteristics. In these cases markets may not perform perfectly, that is, there may be *market failure*. When markets fail, it may be beneficial for farmers to vertically integrate, that is, to bypass the market and conduct transactions through a cooperative.

In discussing particular types of market failure and how they may be remedied through a cooperative, we will focus mainly on marketing cooperatives but will also develop key inferences for supply cooperatives. A useful concept to help analyze marketing cooperatives and understand the determination of farm prices is the *marketing margin*. The margin essentially accounts for all of the costs incurred by the marketing sector in bringing the raw farm product to the consumer. The margin will typically include costs of performing the following marketing functions:

1. assembly of the raw product from the farms,
2. processing,
3. distribution and wholesaling, and
4. retailing.

Alternatively, the margin can be broken down into costs for the inputs such as labor, energy, capital, and materials used by the marketing sector. For a given agricultural product, we can denote the margin as M and the retail price for the finished product as P_r . Given M and P_r , the maximum value, P_f^* , for the farm price, P_f , is

$$P_f^* = (P_r - M) / K \quad (1)$$

where K is a conversion factor indicating the number of units of the farm commodity needed to produce a unit of the retail commodity. For example, it takes roughly two pounds of beef on the hoof ($K = 2.0$) to produce a pound of beef at retail.

If the industries that assemble, process, distribute, and retail the farm product are perfectly competitive as described above, the firms in these industries must operate efficiently to survive. That is, they must perform their functions at the lowest cost possible. Therefore the margin, M , will be as low as possible.

These same competitive pressures will force P_f up to the maximum given by equation (1). Attempts to pay farmers less than this price will be thwarted because competition will bid the price up to what the product is worth. It bears repeating that under this scenario a marketing cooperative would not be able to help farmers. However, when the conditions of perfect competition are not all met in the downstream industries, our simple equation linking farm and retail prices can help pinpoint how cooperatives may make farmers better off.

Three possible ways to raise the farm price are apparent:

1. If a cooperative can market the farm product at a lower cost than the existing noncooperative firms, the margin, M , separating the farm and retail prices can be reduced.
2. If marketing sector firms have *market power* over farmers, they may be able to force farmers to accept a smaller payment than what the product is worth, i.e., a price lower than P_f^* defined in equation (1). A cooperative may counterbalance this market power.
3. If cooperative marketing can increase P_r , that is, if the price consumers pay for products produced from the farm commodity can be increased, a higher farm price will result.

Any action that raises the farm price will raise farm income and make the farmer better off. However, before looking in more detail at the three ways

cooperation may raise farm prices, we need to introduce two additional factors. The first is risk.

Everyone knows farming is a risky business. Prices fluctuate from year to year, and production levels can be similarly volatile. These factors often combine to make farm income very unstable. Income risk is usually personally dissatisfying and also creates management problems.

Thus, if marketing through a cooperative can reduce this risk, we have an additional benefit of integration through a marketing cooperative. We will elaborate on this point shortly. The second additional factor to consider is when no private handler is available to purchase the farm product. For example, the present buyer may go out of business. Under what conditions, if any, will it then be wise for the farmers to organize a cooperative to carry on the marketing activity? We shall pursue this point in more detail, but, first let's return and discuss the three price-related benefits that may emerge from cooperation.

A. Margin reduction.

There are two possible ways to lower the margin through cooperative marketing:

1. The cooperative firm may face lower prices for some of the inputs used in marketing, and
2. The cooperative may market the product more efficiently than is presently being done.

It is unlikely that a cooperative will be able to buy labor, energy or other materials more cheaply than other businesses, but it may be able to extract savings on the cost of capital due to either the manner in which income accrued by cooperatives is taxed and/or to possible advantages of cooperatives in securing cheaper debt capital. We shall discuss the tax element here and defer the question of debt finance to Part 2, Section IIC.

The value of a capital asset, say a processing plant, is based on the income stream net of taxes generated by the asset. Denote the expected stream of gross (pre-tax) income flowing from a processing plant over N years as Y_1, Y_2, \dots, Y_N , where the subscripts denote successive years into the future. Because a dollar of income received today is always worth more than a dollar received some time in the future, we must progressively discount projected earnings from the plant for succeeding years into the

future. This is done by dividing income earned in any year, t , by the amount 1 plus the appropriate interest rate all raised to the power of t .

Finally to obtain the value of the capital asset, the gross income must be converted to net income by multiplying it by $(1 - T_i)$ where T_i is the tax rate for a firm of type i , for example, a cooperative or a noncooperative corporation. Drawing these elements together into a single formula, the value, V_i , of the plant to a firm of type i is

$$V_i = \left[\frac{Y_1}{(1+r)} + \frac{Y_2}{(1+r)^2} + \dots + \frac{Y_N}{(1+r)^N} \right] (1 - T_i) \quad (2).$$

The key point from equation (2) is that if one type of firm faces a lower tax rate than other firms in the industry, $(1 - T_i)$ is a bigger number for that firm and the plant is more valuable to it than to the other firms. In effect, the cost of capital is less for the low tax firm.

A cooperative will usually pay less tax on a given amount of net income than will an ordinary corporation. The reason is that the Tax Code allows cooperatives to pass net income through to their members without paying tax upon it. The income is taxable to the members whether it is received in cash or certificates of allocation that will be converted to cash by the cooperative at sometime in the future.

This income pass-through feature is the same treatment afforded income earned within the various stages of a vertically integrated corporation. There are two reasons it often results in a lower tax rate on net income received by a cooperative compared to its noncooperative counterparts:

1. The cooperative's earnings escape the double taxation that occurs when an ordinary corporation's income is taxable to the corporation and then again to the shareholders when they receive it as dividends.
2. The tax rate paid on income received by cooperatives depends on the farmer/members' tax rates. This rate on average may be lower than the corporate rate paid by the noncooperative corporation.³

Although this tax advantage may not itself provide reason enough to form a cooperative, it can help when other reasons are also present. In particular, if the tax advantage is large, equation (2) suggests that it makes sense for the cooperators to buy marketing facilities from a noncooperative firm in the industry rather than build facilities from scratch.

³A brief set of references on the topic of the taxation of cooperatives is: Morrison Neely and James Baarda, *Legal Phases of Farmer Cooperatives*, Information 100, U.S. Department of Agriculture, Farmer Cooperative Service, May 1976; Lee F. Schrader and Ray A. Goldberg, *Farmer Cooperatives and Federal Income Taxes*, Ballinger Publishing Co., Cambridge, Mass., 1975; and Richard J. Sexton and Terri A. Sexton, "Taxing Co-ops," Parts I and II, *Choices*, Volume 1, 2nd and 3rd Quarters, 1986.

The second way the margin may be reduced is when a cooperative can handle the marketing functions more efficiently (at lower cost) than ordinary corporations. This possibility revolves back to our earlier discussion of the relative efficiencies of handling exchange through markets versus the internal workings of a vertically integrated firm.

The three main advantages to internalizing transactions through vertical integration include:⁴

1. Internalization creates a common incentive among parties, whereas participants to market exchange usually have opposing interests, i.e., the buyer wants to buy low and the seller wants to sell high.
2. Disputes within an organization can be resolved quickly through internal control, while disputes between independent parties often involve costly litigation.
3. Information usually flows more freely within an organization than across markets.

These advantages to vertical integration become most important when a large proportion of farmers' assets are sunk. A *sunk asset* is one whose cost cannot be recovered by resale within a given time period. An asset is partially sunk if only a portion of the cost can be recovered. For example, a custom-built milking parlor is likely to be a sunk asset because it cannot be resold quickly or without considerable loss. On the other hand, hay purchased to feed a dairy herd is not a sunk asset since it can normally be resold quickly with little loss.

Farmers with a high proportion of sunk assets are vulnerable to *opportunistic behavior* on the part of their trading partners. In other words, farmers whose assets are sunk are "stuck" in the sense of lacking alternative opportunities. Trading partners may try to take advantage of this situation. For example, growers who produce highly perishable commodities such as vegetables are vulnerable to opportunistic price cutting by buyers because the harvested crop is often a sunk asset—its perishability gives the grower few resale opportunities.

Similarly on the input supply side farmers who need immediate supplies of inputs such as liquid fertilizers, chemicals, and petroleum are potentially vulnerable to hold-ups by sellers who may try to take advantage of the situation by extracting higher prices.

In principle, buying and selling contracts can be carefully and expensively written to limit the scope

for opportunistic behavior, but contracts need not be honored. The result then is often costly litigation.

These possibilities highlight the incentive compatibility and conflict resolution advantages of internal versus market organization.

We must be careful, however, before attributing these advantages to cooperatives. The reason is that, although cooperatives do accomplish vertical integration for their members, they don't really internalize transactions within a single firm. On the contrary, farmers' need to integrate jointly results in exchange through a cooperative often quite closely resembling market exchange.

Thus, cooperatives do not replace market exchange. Rather, they *harmonize exchange*. In particular, the cooperative and its members usually have common incentives—the farmer wishes to sell at the highest price possible and the member-owned marketing cooperative wishes to pay its members the highest price possible subject to covering its costs. Similarly the farmer wants to buy supplies as cheaply as possible and the farm supply co-op wants to provide them as cheaply as possible subject to the same breakeven proviso.

If conducting exchange through cooperatives can reduce costs due to protracted bargaining, writing and interpreting long-term contracts, litigation, and inefficient information exchange, the margin, which reflects the costs of marketing the farm product, can be reduced and in turn, the farm-level price raised. The main efficiency-enhancing feature of cooperatives to accomplish this margin reduction is, as noted, the harmonization of trade between a cooperative and its members relative to trade between farmers and independent buyers or sellers.

How to recognize when margins might be reduced by cooperation. It is one thing to agree that cooperatives may make trade more efficient and quite another thing to identify the specific markets wherein efficiency could be enhanced through a cooperative.

To begin addressing this important question, it is interesting to note that informal, legally unenforceable contractual relations dominate in the business world and that resort to legal sanctions is rare.⁵ The reason is that most businesses have on-going, mutually profitable relations with their trading partners. A business attempting to behave opportunistically would see its trading relationships severed to its ultimate detriment. In other words, a business' reputation or its *goodwill* are important assets that will

⁴Oliver Williamson has been the most articulate exponent of the efficiency-enhancing features of intrafirm versus market exchange. His recent book, *Economic Organization*, New York University Press, 1986, draws together much of his work on the topic.

⁵See Stewart Macauley, "Non-Contractual Relations in Business: A Preliminary Study," *American Sociological Review*, 28, February 1963.

rapidly be diminished by opportunistic exploitation of trading partners.

However, when goodwill becomes an unimportant consideration in a firm's decision making that we have cause to worry about opportunistic behavior, and harmonizing trade through a cooperative may result in transactions cost savings and margin reduction. Goodwill considerations are less likely to enforce scrupulous behavior on farmers' trading partners in the following situations:

1. A large proportion of farmers' assets are sunk as the term was defined earlier.

The key question for a farmer to ask in respect to his/her trading partners is "what loss would I incur if a partner refused to perform the agreed upon transaction?" For example, for the fresh vegetable grower the answer could range from "nothing," if an alternative buyer could be solicited with a phone call, to "the entire crop," if no alternative buyer were available on short notice. This first factor indicates farmers' vulnerability to opportunism and to the transactions costs incurred to avoid it. The next two factors relate to a business's incentive to behave opportunistically. Opportunism is more likely in

2. industries in long-term decline. Firms will not expect to remain in these industries for long, and, hence, goodwill considerations are not important;
3. times of economic hardship. Short-run survival considerations are the dominant consideration during these times. The long-term consequences of unscrupulous behavior are given little consideration.

In sum, when farmers' assets are sunk and when long-run reputation effects for trading partners become unimportant, farmers are potentially vulnerable to opportunistic price cutting from buyers and price gouging from sellers. The reason we list this behavior under margin reduction is that opportunistic tendencies can in principle be controlled through contracting and litigation. However, these inefficiencies of the market mechanism raise the margin and hold open the possibility that farm product prices may be raised and input prices reduced by harmonizing exchange through a cooperative.

We move on now to discuss the second item on our list of ways farm prices can be raised through a cooperative.

B. Market power avoidance.

The opportunistic behavior we have just discussed results in trading partners attempting to exercise short-term market power over farmers. An alternative, long-term market power may be present

when farmers perennially have only one or a few firms buying farm production and selling farm supplies. Economists use the term *monopsony* to describe a market with only one buyer and *oligopsony* to characterize the case of only a few buyers. In these situations, farmers may be paid less than the fair price, $P_f^* = (P_r - M)/K$, for their product. The reason is simple: with only one or a few buyers, the competitive pressures that normally cause price to be bid up to P_f^* are either absent entirely or are not very strong.

The same principles are at work in the markets for farm supplies, but the terms are somewhat different. *Monopoly* refers to a market with a single seller; *oligopoly* describes markets with only a few sellers. In these markets, sellers will probably try to charge more for farm supplies than it costs to provide them, and competitive forces are often not strong enough to prevent this type of overpricing.

Aside from charging high (paying low) prices, another feature of monopoly (monopsony) power is likely to be charging (paying) different prices to different farmers for no good, i.e., cost-justified, reason. This type of conduct is called *price discrimination*. Price discrimination can be the outcome of playing farmers off against one another and attempting to discern each's minimum selling price for farm production or maximum buying price for supplies.

This type of pricing behavior can persist because competitive forces are usually weak in monopoly/monopsony markets. If markets were competitive, attempts at price discrimination would fail because competition among buyers or sellers would bid the price to a uniform "competitive" level. Several respondents to our survey indicated the presence of this type of discriminatory pricing behavior in their buying or selling markets.

Cooperation is a way to integrate around the market power. Simply put, farmers can organize a cooperative to market their product and no longer have to deal with the monopsony or oligopsony firms. The cooperative will pay its members the largest net price possible subject to covering its marketing costs. Similarly, the purchasing cooperative integrates farmers around monopoly or oligopoly power and supplies its members farm inputs as cheaply as possible subject to covering costs.

Cooperatives' role in circumventing market power is the most familiar justification for cooperatives in a market-oriented economy and has played a key role in the development of many American cooperatives. Nonetheless, several aspects of cooperation in market power environments need to be carefully weighed by groups considering establishing a cooperative.

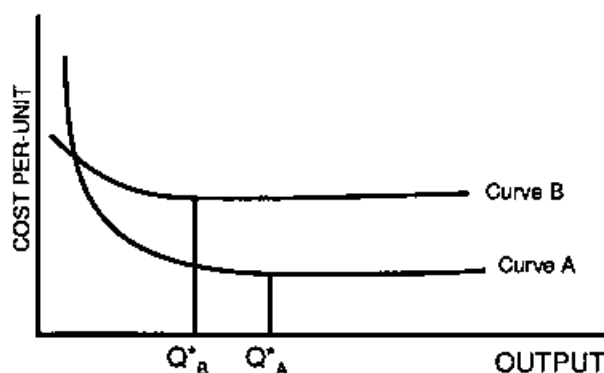
The first concern is the costs involved in marketing the farm product or supplying the farm inputs. A great number of cost studies have been done over the years and regardless of the industry analyzed the studies almost invariably conclude that the curve relating per-unit costs to the level of output is roughly "L" shaped as depicted by the curves in Figure 2. In other words per-unit costs tend to decline, possibly rapidly, over small levels of output and then flatten out thereafter. Only rarely does evidence of "U" shaped per-unit costs surface wherein per-unit costs rise for large-scale firms as depicted in Figure 3.

The concern is that a cooperative formed by farmers to integrate around buyer or seller market power may not achieve sufficient business volume to move to the flat portion of the per-unit cost curve. If this happens, the marketing cooperative's margin will be larger than for the other firms, and the price it will be able to pay its members may end up being less than the other marketing firms' offers. Similarly, a supply cooperative that did not achieve sufficient volume could end up charging more than competitors.

This concern is greatest when the cooperative enters an industry with a high level of fixed costs for capital equipment and relatively low incremental operating costs. These capital intensive industries have steeply sloped per-unit cost curves resembling curve A in Figure 2 with a corresponding large cost penalty for failing to attain the minimum efficient scale (indicated by Q^*_A on Figure 2). Curve B in Figure 2 represents, on the other hand, an industry where the cost penalty for an inefficient scale is quite low. This flat per-unit cost curve would be reflective of an industry, for example, fresh fruit and vegetable marketing, with relatively low capital intensity.

A second consideration in respect to cooperation in monopsony or oligopsony markets is whether vertical integration is actually necessary at all. Farm-

Figure 2. Some Typical L-shaped Per-unit Cost Curves



ers who face market power may be able to achieve improved terms of trade merely by organizing together to bargain with the buyers. An organization of this type is called a *bargaining cooperative*. It does little or no actual handling of the farm product, but attempts through collective bargaining to improve the price farmers receive from the private handlers.

The success of a bargaining cooperative hinges on its ability to organize and control enough raw product volume to force price concessions by the marketing firms. A critical factor is that members must *commit* to marketing through the association so that it has actual control of the raw product.

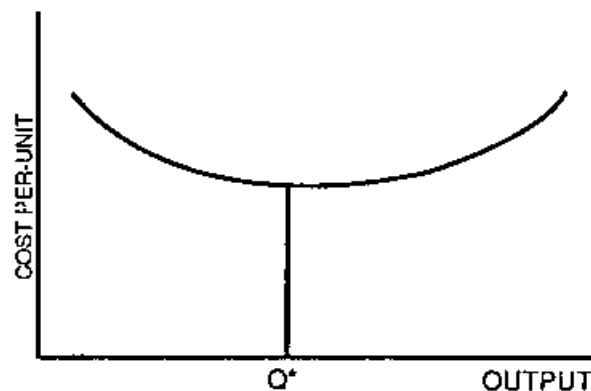
The main leverages a bargaining association can exercise are to:

1. play the marketing firms off against one another, causing them to bid up price, and/or
2. threaten to entirely withhold the product from the private handlers by forming a marketing cooperative to directly process and sell the product. In effect, a bargaining association is one step from becoming a marketing cooperative. Its members have coordinated their selling activity, but they have not yet vertically extended into the market chain.

It is probably the best of all possible worlds if farmers' price enhancement goals can be attained through a bargaining cooperative. The financial commitment is less than for a marketing cooperative, and concerns about achieving production efficiency in marketing are not relevant.

The third concern about countering market power with a cooperative centers on possible barriers to entry into the market. In particular, if the existing buyers are exploiting farmers by paying less than the fair price defined in equation (1), it would seem to present an opportunity for a new firm (one that is not a cooperative) to enter the market and offer to pay

Figure 3. An Example of a U-shaped Per-unit Cost Curve



farmers a higher price and thereby capture a share of the market. As long as the entering firm's price did not exceed P_i^* , it would make at least ample profits. Similarly in farm input supply markets an entering firm could undercut the monopolist's or oligopolist's price, capture a share of the market, and still make an profit.

If no such entry occurs, several explanations are possible:

1. The opportunity has gone unrecognized,
2. The existing firms in the industry have erected barriers to prevent entry, or
3. No entry opportunity actually exists, i.e., no market power exploitation is actually taking place.

The third reason is always a possibility and highlights the importance of potential cooperators being as certain as possible that there is a price-enhancing (price cutting) role to be played before committing to a marketing (purchasing) cooperative. The same can be said of the first reason in which case developing a cooperative is an appropriate response to the market's failure to recognize the profitable entry opportunity.

Of most concern is the second reason pertaining to barriers to entry. If existing firms have succeeded in keeping out other marketing firms, is there any reason to believe entry by a cooperative will fare differently? Certain structural barriers to entry cannot be overcome. These include instances when an existing firm

1. holds patents necessary to a production process,
2. controls the entire supply of a material needed in the production process, or
3. has been granted an exclusive license or franchise to operate in the industry.

In these cases, even though no entry is possible, farmers may still achieve price enhancement through a bargaining cooperative if they follow the guidelines noted previously.

A second type of entry barrier is strategic in nature. If businesses incur sunk costs to enter a market, they will by definition be unable to recover these costs if they are forced to leave the market. The necessity of sinking costs, for example, in the form of nonrecoverable capital investments, is a risk of entering new markets. Existing firms in an industry can exploit this risk to keep out entrants. In particular, threats by incumbent firms of price wars or other forms of ruinous competition can deter entrants whenever sunk costs are important. The reason is that sunk costs prevent a new firm from costlessly

leaving the market if it finds it cannot make a profit given the incumbent firms' behavior.

Thus, in markets with high sunk entry costs and concerns about predatory behavior by existing firms, competitive entry may be forestalled and existing firms may continue to exercise market power. Can a cooperative do any better at breaking the incumbent firms' lock on the market? Recent research suggests the answer may be yes, due to a number of conceptual differences between a cooperative and a noncooperative entrant.⁶ For one thing, a marketing (purchasing) cooperative comprised of the farmers who sell to (buy from) the incumbent firm(s) is a very dangerous entrant from an incumbent's viewpoint. If most or all of the producers decide to market through a cooperative, the supply of product for the other marketing firms dries up. In input supply markets, demand facing the noncooperative sellers would dry up if most of the farmers began patronizing a supply cooperative. In contrast, if the entrant is an ordinary corporation, it and the incumbent firm will usually achieve some mutually-profitable market-sharing arrangement.

Another factor is that a cooperative is comparatively invulnerable to predatory behavior by the incumbent(s). Predatory pricing to drive out a cooperative would involve paying farmers *more* than their product was worth in the marketing context and charging a price less than cost for inputs. While this strategy can quickly inflict losses upon a noncooperative entrant, it plays right into the hands of the co-op members who can sell at inflated prices or buy supplies at cut-rate prices.

The upshot from these considerations is that it will often be in existing firm(s) best interests to deter entry by a cooperative, especially if its members would jointly comprise a large share of the relevant market. As just noted, threats of predation are ineffective against the cooperative, so deterrence can be accomplished only by *committing to raise prices paid (lower prices charged) to farmers sufficiently so that they no longer have incentive to develop a marketing (purchasing) cooperative*. These price improvements must remain in force as long as co-op entry is a threat.

For example, if we denote a new cooperative's marketing costs as M' , the price the cooperative would be able to offer members is

$$P_i' = (P_i - M') / K.$$

The incumbent firms would have to *commit* to a price offer of at least P_i' to prevent the cooperative from developing.

⁶See Richard J. Sexton and Terri A. Sexton, "Cooperatives as Entrants," *Rand Journal of Economics*, 18, Winter 1987, pp. 581-595.

The key implications from this analysis for farmer groups are the following:

1. A threat of vertical integration may be as good as vertical integration itself in accomplishing the farmers' price enhancement goals. The way to realistically pose this threat is through a bargaining cooperative. Farmers considering developing a marketing cooperative should first coalesce into a bargaining association.
2. If the incumbent firm(s) cannot commit to pay satisfactory prices over time, that is, if opportunistic behavior is a strong possibility, the best bet for farmers is to evolve directly into marketing their production through a cooperative. A bargaining association will probably be ineffective.

How to recognize when buyer market power is a problem. We know that farmers are not receiving a fair price if they get less than $P_f^* = (P_r - M)/K$. We can observe the retail price, P_r , that consumers pay for the finished farm products. However, it is very difficult to compute all the costs that go into the margin, M , as the product flows through the several marketing stages depicted in Figure 1.

One possible way to directly judge the performance of marketing firms in a given area is to compare the price they pay with the prices being paid for similar farm products elsewhere. Even this mode of comparison is more difficult than it might initially seem. Farm prices for similar products might differ in different areas for a number of reasons.

1. Regional demand differences may make retail prices and, hence, farm prices higher in some areas than in others.
2. Marketing costs will not be the same across regions for a number of reasons:
 - a. Transportation costs will be less and farm prices consequently higher for producing regions located near major consuming centers.
 - b. Costs for inputs used in marketing will not be the same across regions. For example, labor is cheaper in the South than in other parts of the U.S.
 - c. Processing plants may be more efficient in major producing areas due to efficiencies of large scale operations as depicted in Figure 2.

3. There may be subtle quality differences in the raw products produced in different areas with the higher quality products naturally extracting a price premium.

These factors all indicate the great difficulty involved in directly judging marketing firms' performance. The alternative that economists have frequently employed is to focus on the observable structural characteristics of an industry and infer probable industry *conduct* and *performance* from the structural characteristics. Often times elements of industry *conduct* will also be observable and used jointly with structural characteristics to infer price performance.

An industry's key structural characteristics relate back to the four features of perfectly competitive markets set forth at the beginning of this section. Two are particularly crucial in our analysis of product marketing:

1. The number, relative size and location of buyers.

If only one company buys in an area, the market is a monopsony. If only a few buy, it is an oligopsony. Relative size of the buyers is as important as their numbers. Even if several buyers are available, if a few control a large share of the market, they may succeed in controlling pricing of the farm product to farmers' detriment.

Geographical location of buyers is also a crucial structural factor for many agricultural products. Farmers bear the cost of transporting their raw products from the farm to processing facilities. Often these costs are very high, particularly for bulky or perishable products. Thus, even though several firms may be willing to buy a farmer's production, transportation costs, if processing facilities are not proximate to the farm production, will diminish the net farm price. Therefore, buyers located large distances from the farming region do not provide much protection from possible monopsonistic exploitation by the one or two local marketing firms.⁷

2. The ease of entry into and exit from the marketing industry.

Even when only one or a few firms are available to buy the farmers' product, opportunities for price exploitation are minimized if there are no impediments to entry into and exit from the market. In this case, attempts to pay less than the fair price would be foiled by entrants who could purchase the product at a higher price, perform whatever marketing services are needed, sell the finished product and still make a profit.

⁷Examples of organizing a cooperative primarily to reduce marketing transportation costs are provided in D. M. Simon, W. R. Garland, and Jan Halkett, *Establishing a Cotton-Ginning Cooperative in the Southeast*, U.S. Department of Agriculture, Agricultural Cooperative Service, ACS Research Report 7, May 1981; and Jerry G. West and Lionel Williamson, "Can a Cooperative Succeed Serving Small Family Farms?" *Farmer Cooperatives*, 44, September 1978, pp. 26-27.

Entry and exit are not free if entrants must incur sunk (nonrecoverable) costs. Capital-intensive industries will almost always involve a significant portion of sunk costs because specialized equipment can usually not be resold quickly without loss.⁸ Other costs besides capital costs may also be sunk. For example, the entrepreneurial labor involved in starting a business is a sunk cost.

The need to sink costs can deter entrants who are unsure of a market's future profitability. In turn, the entry mechanism can no longer be guaranteed to protect farmers from price exploitation.

In addition to these structural characteristics, the main type of market *conduct* that needs to concern farmers is coordinated pricing among marketing firms (i.e., cartel behavior) intended to offer farmers less than the fair price defined in equation (1). Overt collusion among buying firms is not necessary to achieve coordinated pricing. Rather, coordination may evolve informally over time with, for example, one firm acting as a price leader and others quickly matching the leader's price offer.

Detecting coordinated pricing may be difficult. The absolute level of the price being offered will usually not provide much evidence because of the many factors just noted that can cause price level differences between regions.

Either buyer or seller cartels are usually prone to at least temporary instability because individual firms can make money by cheating on a pricing agreement. Two pieces of evidence reflect this instability and in turn, the possible presence of a buyer cartel:

1. Periodic receipt by sellers of "under the table" offers to buy at above the announced price.
2. Price wars, that is, sudden and often large increases in the price being paid followed by an equally sudden decrease. Such behavior reflects the breakdown and subsequent restructuring of a price agreement.

To summarize, if farmers have only one or a few selling opportunities within their geographic region and if barriers to entry into the marketing industry are high, the prospects are good that the farmers will be subject to monopsony or oligopsony exploitation. Further evidence is provided by signs of coordinated pricing among buyers.

Farmers' best strategy in these cases is to coalesce into a bargaining cooperative and attempt to elicit price improvement through that organization. If this step is unsuccessful, the next step of integrating into a marketing cooperative should be considered. We shall discuss the key elements in developing these organizations in Part 2 after completing our discussion of the prospective benefits from cooperation.

How to recognize when seller market power is a problem. Most of the rules just discussed for buyer market power apply also to market power for the supply of farm inputs, so this discussion can be brief. Any time farmers pay more for farm supplies than the cost of providing them including a fair rate of profit, they are paying too much.

Once again, though, it may be very difficult to judge directly if prices are too high based on this standard. Regional price comparisons for the same product are not entirely accurate because of possible differences in the costs of providing services. Nonetheless, these direct price comparisons probably work better in farm input markets than in the farm output markets.

Persistently higher prices in one area compared to others that are not explainable through transportation costs, different state sales or excise taxes probably reflect market power. If any large, regional supply cooperatives operate in the general area (e.g., Cenex or Farmland Industries), the simplest way to attack this market power may be to convince the supply cooperative to extend operations into the affected area.

If direct price comparisons cannot be made, the key structural and conduct characteristics described in the previous section can be used to infer performance.

An additional complicating factor in judging the performance of input supply markets is product differentiation and advertising. Many sellers of farm implements, chemicals, seeds, etc. make special claims for their products and heavily advertise these claims. Concerns are twofold:

1. Does the product differentiation reflect genuine quality improvements which merit paying a price premium or does it reflect hype or needless frills?
2. Are expenditures on nonprice competition including advertising and product differentiation needlessly raising prices?

⁸Not all capital costs are sunk costs. For example, the bed preparation and track for a railroad are sunk costs, but costs for the train itself are not sunk because the train can easily be shifted to operate on another track. A technical discussion on this subject is provided by William J. Baumol, John Panzar, and Robert Willig, *Contestable Markets and the Theory of Industry Structure*, ACS Research Report 7, Harcourt, Brace, Jovanovich, New York, 1982, especially Chapter 10.

Quality differences may be surprisingly easy to investigate merely by evaluating the ingredient listing in fertilizer, feeds, and chemicals. Usually product differentiation and advertising go hand in hand with a market having comparatively few sellers, i.e., an oligopoly. To the extent that these features introduce additional needless selling costs, they provide an additional opportunity (along with combating price enhancement) whereby a supply cooperative may be able to cut purchasing costs for its members.

C. Using marketing cooperatives to influence consumer prices.

If farmers can increase the prices for their products at retail, naturally farm prices will also increase. Two possible avenues exist to accomplish this goal:

1. The cooperative may be able to restrict the flow of farm product to the market.
2. The cooperative may be able to improve quality of the finished products.

We shall discuss each possibility in turn. Over-supply relative to demand lies at the heart of American agriculture's financial dilemma. If farmers could jointly agree to restrict production, they could raise prices, reduce costs, and increase profits. However, farmers individually have no incentive to abide by output restriction agreements, and thus, proposals to control output have usually been destined to fail. For a cooperative to have success in restricting the flow of product to the market and, hence, raising price, the following factors must be present:

1. The cooperative must control a large share of the relevant supply. If a market is national or international in scope, or if production is scattered among many thousands of producers, such control is not possible. However, for local or regional markets such as fresh fruits and vegetables, the possibilities are better.⁹
2. The cooperative must have a way to keep excess production off the market. Volume control can be accomplished by
 - a. closing membership and/or
 - b. restricting members' deliveries.

However, simply refusing to process the excess production through the cooperative will have no effect on market price if alternative sales outlets are available. *The excess production must be kept entirely out of the market.*

We should note that cooperatives that succeed in raising price in this manner may run afoul of the Capper-Volstead Act of 1922. This legislation gives

farmers the right to organize into cooperatives, but it also authorizes the Secretary of Agriculture to investigate instances of undue price enhancement by cooperatives. That this authority has never been exercised is probably evidence of the limited success cooperatives have had at monopoly price enhancement.

The second way to raise retail and, thus, farm prices through cooperatives is by improving quality assurance. There are two reasons why a cooperative may be effective in this regard:

1. Production and marketing may be better coordinated through a cooperative than through ordinary market channels due to the improved flow of information, characteristic of a vertically integrated enterprise.

Thus, the marketing cooperative may be able to successfully coordinate quality specifications with its members, set planting and harvest times to maximize quality and so forth.

2. Private handlers of farm products at times will have incentive to shirk on quality.

Maintaining quality is costly, and private handlers for whom reputation is not a consideration can make money by diminishing quality and deceiving consumers. Of course, this strategy only works in the short term, and consumers will react by cutting purchases of the item. The quality-cutting handler can leave the industry counting its short-run, ill-gotten gain, but farmers are left to bear the brunt of disgruntled consumers and, consequently, reduced demand and lower farm prices.

How to recognize when a marketing cooperative can raise retail prices. The number of situations when cooperatives can exercise market control to raise retail prices is probably limited. The main exceptions to this rule are when markets are local or regional in nature and when production is concentrated within the hands of a relatively few producers. Markets tend to be local or regional for perishable and costly-to-transport products. Fresh fruits and vegetables, bread, and fluid milk tend to be local markets, for example, but improvements in transportation technology are increasing the geographic scope of these markets over time. In addition, new entry into production of the product must be limited. (An example of limited entry would be tree crop production where there is usually a four to seven year lag from planting to initial harvest.)

Attempts by farm producers to regulate the supply of their product will usually be enhanced by the presence of a federal or state marketing order.

⁹Even though fresh fruits and vegetables may be shipped in from distant regions, transportation costs are high. This factor gives local producers an element of joint market power.

Marketing orders give the force of law to volume control plans. This, in turn, overcomes the usual problem of producers tending to not abide by the controls.

Quality control problems can usually be observed, and consumer complaints do filter back to the producer, so there is no mystery involved here. Problems are most likely when there are many competing marketing firms, with frequent entry into and exit from the market. In these cases, handlers are hard-pressed to make money and will be tempted to cut costs by cutting quality. Transience of the marketing firms creates a time horizon problem. Destroying consumer's confidence does not hurt these firms if they planned to leave the industry anyway. It does hurt producers for whom farming usually represents a lifetime commitment.

It has been demonstrated over and over that consumers will pay premium prices not only for quality but for the *assurance of quality*. Thus, if the structural symptoms of quality cutting are present or if poor or inconsistent quality of the product delivered to consumers is observed, cooperative marketing may be the answer. For example, Sunkist Growers began in the early 1900s to address precisely this problem.¹⁰

Having completed our discussion of ways cooperation may raise the overall level of a farm product price, we turn now to consider cooperation's role in reducing the variability of farm prices and income.

D. Risk reduction through cooperatives.

One of the reasons often given to explain vertical integration by businesses is the need to attain more assured access to the upstream or downstream markets. The same sort of risk-reducing behavior has also been attributed to agricultural cooperatives. Recent examples are the fuel and fertilizer shortages of the early- and mid-1970s.¹¹

The basic point to risk is this: Let a farmer's income stream over a number of years, say N , be denoted by I_1, I_2, \dots, I_N . Chances are the income stream will trend upward over time. We could subtract out the trend component of the income stream and call the detrended series $I_1^*, I_2^*, \dots, I_N^*$. The mean or average of the series is

$$\bar{I} = \frac{I_1^* + I_2^* + \dots + I_N^*}{N}$$

The farmer faces significant income risk if the year-to-year earnings levels fluctuate widely about the average. A common measure of this risk is the variance of the income stream computed as

$$\text{Var}(I^*) = \frac{[(I_1^* - \bar{I}^*)^2 + (I_2^* - \bar{I}^*)^2 + \dots + (I_N^* - \bar{I}^*)^2]}{N} \quad (3).$$

The higher the variance, the riskier is the income stream. Risk is usually bad for two distinct sets of reasons:

1. Most people simply prefer a stable income stream to one that fluctuates widely. These people are said to be *risk averse*.
2. Risk makes it difficult to efficiently plan and manage the farm operation. Credit becomes more difficult to obtain and it is harder to coordinate long-term investment decisions.

Thus, if cooperatives can reduce exposure to risk, they help farmers at both a personal and professional level. We begin by setting forth two basic types of market risk that arise in different contexts.

1. In some markets prices are inflexible and markets do not clear. (If prices are free to move up and down, markets should always clear in the sense of equating demand and supply.)

In these cases farmers may face sales rationing in the downstream market and rationing of purchases in the upstream input markets. (By rationing we mean being unable to buy or sell all that is desired at the price.)

2. Markets that do have flexible prices will clear so rationing is not a problem but wide price swings are possible with the effect being to increase farmers' exposure to risk.

The question for farmers who recognize one or both of the above conditions in their markets is how can a cooperative help? We consider first the case of markets with inflexible prices and possible rationing. Prices may be fixed, for example, due to government regulation or long-term contracts. Even if prices are not absolutely fixed, they may be inflexible because businesses consider it imprudent to make frequent price changes. On the selling side, a marketing cooperative can deal with the risk of rationing in one of two possible ways.

1. The cooperative can have a *closed membership* with the membership strategically chosen so

¹⁰See C. H. Kirkman, *The Sunkist Adventure*, U.S. Department of Agriculture, Farmer Cooperative Service, FCS Information No. 94, 1975.

¹¹See, for example, Donald L. Vogelsang, *Cooperative Farm Fertilizer Costs*, U.S. Department of Agriculture, Economics Statistics and Cooperatives Service, FCS Research Report No. 8, 1979 and Warren J. Mather and Homer J. Preston, *Cooperative Benefits and Limitations*, U.S. Department of Agriculture, Economics Statistics and Cooperatives Service, Cooperative Information Report No. 1, Section 3, 1980.

that the cooperative will have a high probability of being able to market all of its members' production.

In years when additional raw product is needed, the cooperative can attempt to procure it from nonmembers. (The issues of open versus closed membership and whether to accept nonmember business are discussed in Part 2 of this report.)

2. The cooperative can have an *open membership* and agree to provide a "home" for members production even though some production may have to be destroyed or diverted.

In the first instance the cooperative shifts risk from members to nonmembers. In the second case it pools the risk and the costs of sales rationing. In other words, the open membership cooperative does not avoid the consequences of sales rationing, but it spreads them in an equitable fashion among the members so as to minimize their effect. A noncooperative handler, alternatively, might buy all the production from some farmers and nothing from others.

The same types of considerations are at work with upstream integration and a purchasing cooperative. For example, during the fertilizer and petroleum shortages of the 1970s, cooperatives limited sales to members and kept comparatively low prices. The first element of this strategy reflects the member/nonmember dichotomy noted above, while the pricing policy reflects the cooperative's goal of providing service as cheaply as possible.

Turning now to analyze markets with flexible prices, consider the elements that determine the farmers net income, I . Revenues are just the price, P , times the quantity sold, q . Costs are closely related to the amount produced and for simplicity we can write them as a constant function, C , of the amount produced. Thus, we have

$$I = (P - C)q.$$

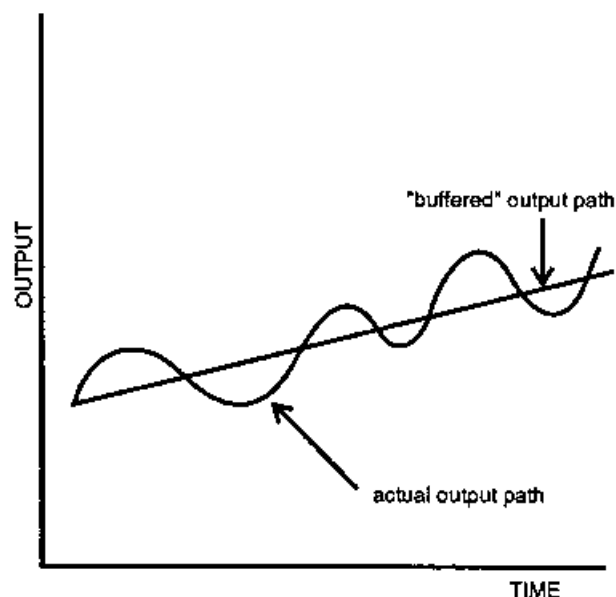
Income is subject to risk because each of the three elements that determine it are subject to random fluctuations: P varies due to changes in output market conditions, C goes up or down based on conditions in the input markets, while q depends upon growing conditions and other natural phenomena.

Cooperatives can possibly help farmers cope with this inherent risk in either of two ways:

1. If the cooperative controls a significant share of the relevant market and the commodity is storable, it can reduce price fluctuations by maintaining *buffer stocks* of the raw commodity.
2. Without controlling a significant share of the market, cooperatives may still help farmers cope with risk through diversification.

The idea of a buffer stock is illustrated in Figure 4. The cooperative effectively chops the peaks and valleys off from the cyclical production path by withholding commodity from the market in high supply years and releasing stored commodity onto the market in tight supply years.

Figure 4. The Effect of a Buffer Stock Program



Ideally, the buffer stock results in a uniform flow of product on to the market and hence, stable prices and incomes. However it is hard to make buffer stocks work. The U.S. government's experience with buffer stocks has not been particularly successful, and it's naturally harder for a single company to make them work.

Control of a large share of the market is necessary if the stocks withheld from or added to the market are to have a significant impact on price. A "free-rider problem" also hinders these programs. For example, producers outside the cooperative have no incentive to withhold production during high supply years. Instead they "free ride" on the enhanced prices brought about by the cooperatives' supply management. In turn, this creates discontent among the cooperatives' members. To limit free riding the cooperative must control a large share of the product.

One of the few cooperatives to successfully perform this buffering role is the California Almond Growers Exchange (CAGE). (CAGE has recently changed its name to Blue Diamond Growers.) CAGE's experience highlights the importance of the points made here. Almond production is highly unstable, but the commodity is quite easily stored. Moreover, CAGE markets over 60 percent of the U.S.

almond crop and 40 percent of the world's supply, among the largest market shares of any U.S. cooperative.

Most cooperatives, especially new ones, cannot expect to play this buffering role. An alternative, risk-management role is possible through pooling.

Pooling occurs when a cooperative markets several different products (or supplies several different inputs) and lumps all proceeds into one or a few "pools." Farmers then receive allocations from the pools in proportion to their patronage with the cooperative. For example, a cooperative may market several different fruit and vegetable commodities. It will usually give growers a partial payment (a so-called "established value") at the time of harvest. Subsequent payments come from the pools. This feature results, for example, in peach growers sharing in income from tomato production and vice versa. By lumping the returns from several commodities together in this fashion, the effect *may* be to diversify risks and stabilize growers' income streams.

In fact, agricultural producers themselves are often diversified, producing and selling multiple commodities. However, modern capital-intensive farming systems tend to encourage specialization. Thus, as producers lose the risk diversifying effect of producing several commodities on the farm, it may make sense to regain diversification through a cooperative.

Problems are twofold, however. First, one grower sharing in another's revenue introduces a *cross-subsidy* which, in turn, distorts market signals and leads to overproduction of some products and underproduction of others. This situation will lead to member discontent unless the cross-subsidies cancel over time. Second, multiproduct pooling may actually hinder a natural tendency for revenue streams to stabilize. That is, years with poor production tend to cause high prices and hence, offsetting revenue effects. With pooling, however, the growers who have the poor supply do not get the full benefit of the high price. They instead share it in the pool with producers of other commodities.

How to recognize when a cooperative can reduce income risk. The risk generated from participating in a market is an easily recognized element of the market's performance. Most agricultural industries are subject to frequent and wide price swings, so the question is not how to detect risk but how to recognize when a cooperative can mitigate the risk or its effects.

Privately-held buffer stocks, as noted, will have a stabilizing effect on price only when the cooperative controls a significant share of the product as in

the case of CAGE. Of course, the product must be storable. Buffering is not a realistic short-term goal for newly developed cooperatives.

The success of pooling hinges on finding commodities with inversely correlated income streams. Two relevant statistical measures to judge this feature for any two commodities are the *covariance* and the *correlation coefficient*. Denote detrended income streams as before by $I_1^*, I_2^*, \dots, I_N^*$ and the mean of the series by \bar{I}^* . Also let the subscripts i and j denote any two different commodities. Then we have the following formulae:

Covariance:

$$\text{Cov}(I_i^*, I_j^*) = \frac{\left[(I_{1i}^* - \bar{I}_i^*)(I_{1j}^* - \bar{I}_j^*) + \dots + (I_{Ni}^* - \bar{I}_i^*)(I_{Nj}^* - \bar{I}_j^*) \right]}{N}$$

Correlation coefficient:

$$\text{Cor}(I_i^*, I_j^*) = \frac{\text{Cov}(I_i^*, I_j^*)}{\sqrt{\text{Var}(I_i^*) \text{Var}(I_j^*)}}$$

where the $\text{Var}(I^*)$ formula is provided in equation (3). A negative value for either measure means the income fluctuations for the two commodities have tended to offset over the N years of data. Thus, these commodities are possible candidates for pooling. The correlation coefficient has the advantage of ranging from -1.0 to $+1.0$, with -1.0 representing the unlikely case of perfectly offsetting fluctuations, 0 representing no correlation, and positive values indicating fluctuations that move together. Thus, large negative values for the correlation coefficient indicate especially good commodity candidates for pooling. Information needed to compute these statistics, such as a measure by crop of income per acre, should be available from farm advisors, county extension agents, or land-grant university extension economists.

Pooling itself is probably not a worthwhile reason to start a cooperative, but if a cooperative is being considered for other reasons, the risk pooling potential, if any, should be considered.

E. Cooperation in markets where no alternative market opportunity exists.

Up until now we have been weighing the advantages of cooperative marketing or purchasing versus dealing with private, noncooperative handlers operating in the same markets. However, farmers have often faced and continue to face situations where no private handler is willing to serve a market. Can cooperation possibly be a good idea in these situations?

On the surface the answer would seem to be "no." If no for-profit company can earn a satisfactory return by serving the market, how then can a cooperative do better?

In fact, there are three reasons that suggest a cooperative might be successful where noncooperative counterparts have not. Thus producers faced with loss of markets due to exit by all for-profit handlers ought to at least consider cooperatively acquiring one or more of the facilities. The reasons are as follows:

1. As much of our previous discussion has indicated, a cooperative may be able to operate more efficiently than the unsuccessful noncooperative handlers. In the case of product marketing, an efficient cooperative may be able to operate with a smaller margin than the noncooperatives were able to achieve.
2. The farmer-members of a cooperative are probably willing to accept a lower return on investment than are the owners of noncooperative firms.

This statement reflects the common perception that most farmers get intrinsic satisfaction from farming and, thus, will *and do* accept lower returns on their investment than are typically earned in other industries. As such, a rate of return on a processing plant that may be unacceptable to nonfarm investors may be acceptable to the farmers especially if preservation of their livelihood is at stake.

3. The harmonization of exchange afforded by cooperation enables flexible pricing methods to be instituted that can extract value from product marketing or input purchasing unattainable to noncooperative firms.

Our third point is crucial, and to fully illustrate it requires introduction of a few additional economic concepts. Focusing on the case of a possible marketing cooperative, denote quantities of the farm product being supplied with the letter Q . Farmers' supply curve, denoted as $S(Q)$, indicates the minimum price farmers as a group need to provide various levels of output. The supply curve is determined by the (incremental) costs of producing various amounts of the product. Supply curves normally slope upward, i.e., to supply ever greater amounts, farmers must be compensated with a higher price.

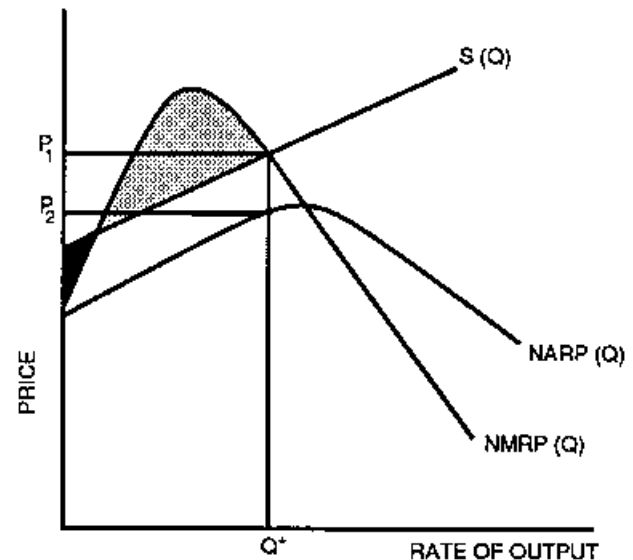
Next, if we take the price at which the finished product can be sold and subtract off the margin, we obtain a curve that measures the maximum price a handler could pay for the raw product while covering all marketing costs including an acceptable return on investment. This curve is often called the

net-average-revenue-product curve for the raw product and is denoted by $NARP(Q)$.

Finally, the *net-marginal-revenue-product* curve measures how much each incremental unit of the farm product is worth. The $NMRP(Q)$ is the difference between the final selling price and the *incremental* (not average) cost of marketing it.

All three curves are drawn in Figure 5 with the general shape they are usually considered to have during any short-run time horizon. $S(Q)$, recall, indicates the minimum price farmers need to receive to cover their variable production costs and $NARP(Q)$ indicates the maximum price a processor can pay and still cover its costs. The two curves do not intersect as the diagram is drawn. In other words, we have a market that cannot be profitably served.

Figure 5. Optimal Behavior for a Marketing Cooperative When No Single Price Will Cover Costs



However, the $NMRP(Q)$ curve, which says how much each incremental unit of the raw product is worth, does lie above the supply curve for some levels of production. In fact, if Q^* units of the raw product are produced (the intersection point of $S(Q)$ and $NMRP(Q)$), the total revenues in excess of variable production and marketing costs from producing and selling the product are graphically depicted by the large dotted region minus the small cross-hatched area.

The problem for the noncooperative marketing firm constrained to deal with farmers at arm's length is that no single price enables it to extract any of these profits. However, a cooperative is ideally suited to practice flexible pricing. In the present example, it should pay producers a price of P_1 per unit and in so

doing extract the maximum total profits available from producing and marketing the product. To cover its marketing costs, the cooperative must recover from members the amount $(P_1 - P_2)Q^*$, which can be done, for example, by charging an annual membership fee.

Although we shall not illustrate it, the same principle holds for a farm input purchasing market. The key is a cooperative's ability to choose the "best" output level, implement flexible pricing and cover an operating deficit with fixed charges to the membership. If the situation is as depicted in Figure 5, farmers will be able to pay these charges and still earn a satisfactory return on their total investment.

How to recognize when cooperation can be successful in markets that ordinary corporations will not serve. Farmers may face either of two alternative scenarios in this context. A market may have never been served or firms are leaving a market that previously had been served. Examples of the former situation have been provision through cooperatives of rural telephone service and electricity. Modern examples might include provision of services such as videotext (e.g., cable TV, remote transmission of auctions), integrated pest management and computer software. In terms of product marketing, instances abound wherein producers would like to locally market fresh fruits, vegetables, home baked products, crafts, etc. but have no outlets. Other examples are specialty products, e.g., angora wool, that appear to have a number of willing producers but no market outlet.

In these instances no direct comparisons can be made between the past performance of a noncooperative handler and the prospective performance of a cooperative. Therefore, information needed to make a wise decision may be difficult to attain.

Consider, for example, a possible cooperative to market angora wool. A number of people appear willing to raise the rabbits, and clothing manufacturers do use the processed wool (presently importing most of their needs). The gap in the market is that no domestic company presently buys and processes the wool. The potential rabbit producers and wool processing cooperative owners probably have a good idea of the rabbit production costs. They *may* be able to find out something about processing costs if such facilities are located elsewhere. Hardest to discern is probably demand for the processed product.

A great deal of uncertainty unavoidably clouds decision making in these situations. Considerable market research is called for but is expensive to

undertake. A technique often used by the USDA Agricultural Cooperative Service in assisting potential cooperatives is to conduct surveys to determine both potential demand and supply for the services of the cooperative.

The decision over whether to cooperatively acquire and operate facilities of a defunct or soon-to-be defunct handler is more structured than navigating the uncharted waters of developing an entirely new venture. Potential cooperators should consider each of their three possible advantages over a noncooperative business.

In judging whether a cooperative may operate more efficiently than its predecessor(s), decision makers should review the previous discussion of ways in which cooperation may reduce the marketing margin.

They can also attempt to discern the recent return on equity in the noncooperative business. Return on equity (ROE) is the net profits of the business divided by the owners' equity. This information should be available from the financial statements of a publicly-held corporation. For a privately-held firm the information should be provided as part of any purchase negotiations. The key point is that the corporation's minimum-acceptable return on investment may be greater than the potential cooperators require.

For example, over the past 50 years, *real* (inflation-adjusted) return on corporate equity has been about 7 percent. On the other hand the return on equity in U.S. agriculture in 1985 was -12.9 percent including capital losses, the sixth consecutive year real returns have been negative.¹²

The final consideration to weigh is whether a cooperative's built-in pricing advantage will enable it to extract sufficient revenue to cover its costs, while leaving enough income to make the farming operations profitable. One key to answering this question is to discern if there are differences among farmers in their willingness to pay for a farm input or service or in the reservation price they must have to supply the product. Paying less than what one was willing to pay or receiving more than one needed results in what economists call an *economic rent*. It is a return to fixed factors of production, for example, capital and possibly operator's labor.

An ordinary corporation constrained to charge the same single price to everyone cannot capture differences in economic rent. A cooperative can capture part of these rents by, for example, differentiating membership fees among members in proportion to

¹² U.S. Department of Agriculture, Economic Research Service, *Economic Indicators of the Farm Sector*, ECIFS S-2, November 1986.

their holdings of a fixed asset such as land. By capturing some of the rents, the cooperative may be able to cover its costs and still generate net benefits for the membership.

The second key tied to a cooperative's ability to invoke flexible prices is to charge or pay the *optimal price*. For a purchasing cooperative this price is equal to the *incremental* (not average) cost of supplying the input or service. For a marketing cooperative, this price is equal to the *incremental* (not average) net revenue generated by the raw product (see Figure 5). Revenues generated from charging these optimal prices will usually not cover costs in the type of markets we are addressing, but they will generate the maximum value for the membership. The cooperative then must extract a portion of this value in the form of a membership fee to cover its costs. (Optimal pricing for a cooperative is discussed in Part 2 of this report.)

III. Summary.

The first key to successfully developing an agricultural cooperative is that the organization have a genuine economic role to play. The cooperative must be able to provide net benefits for its members in excess of what is available through other market channels, or as the oft-used phrase states, "a cooperative must be born of necessity."

Part I of this report has been devoted to enumerating and analyzing the benefits that a cooperative

may be able to provide in a market-oriented economy as in the United States. Cooperation's possible benefits include the following:

1. Cooperatives may be able to operate more efficiently (on a smaller margin) than nonco-op counterparts.
2. Cooperatives may help farmers avoid the effects of their trading partners market power.
3. By controlling the flow of production or by assuring product quality, marketing cooperatives may increase prices paid at retail for their finished farm products.
4. Cooperatives may reduce aspects of the risk and uncertainty that plague farming.
5. Cooperatives may be able to operate successfully in markets that no for-profit company will serve.

Throughout the discussion of these possible benefits to cooperation, particular attention was paid to describing the market structure, conduct or performance characteristics, which tend to suggest the types of market failure that a cooperative can correct.

Part 1 of our "blueprint" is now complete, but even cooperatives that have a critical economic role to play will not succeed unless they are organized, financed, and operated properly. Part II of the report analyzes these keys to successful cooperative development.

PART 2. THE ORGANIZATIONAL, FINANCIAL AND OPERATIONAL KEYS TO DEVELOPING A SUCCESSFUL COOPERATIVE

I. Organizational Keys to Success.

This section discusses critical elements in the success or failure of a cooperative relating to membership, vertical integration within a cooperative, and the structure of decision making.

A. Membership.

Probably the two most important causes of failure among cooperatives are insufficient membership and, hence, insufficient business volume and insufficient equity financing. We discuss membership here and equity generation in the next section.

1. Developing the initial coalition.

Establishing a cooperative first involves developing a coalition of potential members. But coalitions do not form costlessly. People must invest time and money to bring other people together. Here, however, we encounter a problem with the cooperative organizational form. It offers no special monetary rewards for the people who develop the idea for a cooperative and do the initial work needed to get the business going.

People who perform these roles in developing ordinary businesses are called *entrepreneurs*. People who perform the entrepreneurial role in successful nonco-op corporations can expect to profit handsomely from their work because capital (their investment) is the residual claimant in these corporations.

The same type of entrepreneurial vision and energy among key individuals is also needed to develop a cooperative. However, the financial benefit to these people is based on their opportunity to patronize (that is, to sell to or buy from) the cooperative and will be no different than for any other member. In short, the cooperative organizational form does not offer special financial rewards for entrepreneurship.

No doubt this factor sometimes results in cooperatives not being formed even when there is a need. Even though several farmers may recognize the need for a cooperative, in some cases none may perceive a sufficient *individual* gain to incur the entrepreneurial start up costs. Two ways exist to surmount this inertia:

1. Appeal must be made to the same sense of civic responsibility that causes people to serve on school boards, town boards, church councils, and other organizations that offer responsibility but little financial gain.

2. As many people as possible should be involved in the initial stages to spread the entrepreneurial costs.

Within any community certain people tend to be more civic minded and to perform service roles better than others. These people need to be involved in a new cooperative venture as early as possible because the presence of these leaders will stimulate the involvement of others and, thus, lower the organizational burden that any one individual must face.

Our survey evidence reported in Part 3 indeed suggests the likelihood of success in a new cooperative increases as more people become involved in the initial organizational stages.

2. Building the membership.

As a general rule of thumb, a new cooperative should strive to get as large a membership as possible at the time of start up. The reason is that a vast amount of evidence compiled from years of research in diverse industries suggests that usually *efficiency increases with size of an operation*. At worst, efficiency levels are neutral in respect to size.

Economists use the terms *economies of size* or *increasing returns to size* to describe the direct correlation between size and efficiency. Two types of size economies are distinguished: *physical* and *pecuniary* economies. Both are worth discussing in some detail.

Physical economies refer to the actual production process, and their presence means that a larger operation can produce at a lower cost per-unit than a smaller counterpart. This phenomenon is represented visually by the decreasing portions of the per-unit cost curves drawn in Figures 2 and 3 in Part 1.

Reasons for physical economies of size are:

1. Economies of mass production including
 - a. specialization in input use,
 - b. better utilization of capital,
 - c. access to the most advanced technology.
2. Better use of management and central administration.

Physical economies of size are apt to be particularly important for capital-intensive activities such as fruit, vegetable, meat, or dairy processing and fertilizer or chemicals manufacturing. The more members the cooperative attracts, the greater its output level will be and the more able it will be to capture economies of size. As the discussion in Part 1 indicated, economies of size are usually exhausted at some output level and the per unit cost curve flattens out as

depicted in Figure 2. Only rarely does evidence indicate an increasing unit cost curve like the one drawn in Figure 3.

Pecuniary economies occur when a larger firm extracts price *discounts* on its purchases of supplies and price *premiums* on its sales. Pecuniary economies are important because it is usually cheaper to conduct business in large, standard-size volumes.

Buyers prefer to make purchases in standard quantities such as the volume of a railroad car or semi-trailer. Sellers who cannot provide these volumes will be paid less, if they can make the sale at all.¹⁹

Another advantage in cooperative marketing of a large membership and sales volume is that it enhances the reliability of the product flow. In other words, fluctuations in farm production will tend to cancel across large numbers of producers to result in a steadier flow of product to the cooperative. Experts in marketing invariably cite reliability of supply as a critical factor in establishing a marketing network. Buyers will prefer reliable suppliers and will pay them price premiums.

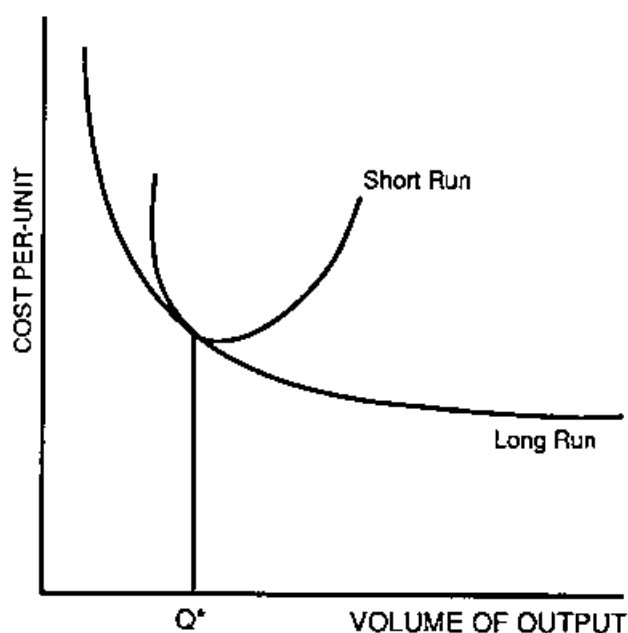
The key element about economies of size and achieving sufficient membership to exploit them is that *the membership must be present at the cooperative's inception*. This is due to the dichotomy between what economists call the *short run* and the *long run*. When the cooperative is in its pre-operations, planning stage, this is the long run. Essentially the cooperative can at this time adopt whatever size of production and marketing facilities it feels will most efficiently handle its prospective business volume.

Once this decision is made and facilities are built or acquired, the cooperative is "stuck" in the sense that many of these plant and facilities costs are sunk, that is, nonrecoverable. The scale of operation cannot be adjusted quickly.

Most modern production facilities are designed to operate at a particular rate to efficiently produce a given volume of product. Deviations from this optimal volume will cause per-unit production costs to rise usually quite rapidly.

Figure 6 illustrates this point for a hypothetical marketing cooperative. The curve labelled long run is similar to those in Figure 2. Based on its expected membership and the members' expected business volume, the cooperative acquires a plant that can efficiently process Q^* units of product per season. However, if members produce more than Q^* , the plant will be pushed beyond its efficient capacity and costs will rise along the curve labelled short run.

Figure 6. Per-unit Costs in the Short Run and the Long Run.



Similarly per-unit costs will rise rapidly if much less than Q^* is processed since the facility is operated at less than the efficient capacity. In other words, once a facility is acquired, the cooperative will be constrained to move along the short-run curve.

Development of the appropriate scale of operation is absolutely critical for the success of an emerging cooperative, but making the best decisions can be difficult. A common cause of recent failures and financial stress among cooperatives has been overexpansion. Not unlike their farmer members, many cooperatives overinvested in capital facilities during the 1970s. When this capacity turned out to be unnecessary, the cooperatives ended up reducing volume along the high-cost short-run curve in Figure 6. As such, they were often unable to service the large debt load that usually accompanied these investments.

On the other hand a very conservative cooperative may not end up developing a large enough scale of operation to exploit the available economies of size.

Three axioms for membership policy emerge from this discussion as ways to help cooperatives utilize economies of size while yet avoiding the grave problems associated with over expansion.

1. Subject to geographic constraints, membership should be made as large as possible at the outset. Although there may be exceptions to this rule, they are few.

¹⁹For example, evidence of pecuniary economies in the production and marketing of cotton is provided by Edward G. Smith, R. D. Knutson, and J. W. Richardson, "Input and Marketing Economies: Impact on Structural Change in Cotton Farming on the Texas High Plains," *American Journal of Agricultural Economics*, 68, August 1986, pp. 716-720.

Some situations are much more amenable to generating a large cooperative membership than others. Needless to say, the greater the economic need for the cooperative, the more likely are farmers to wish to become involved, but other factors can also markedly increase or decrease the transactions costs of building a membership. Organizing costs will be lower when farmers

- a. are located in a compact geographical area,
- b. have similar economic and demographic backgrounds, and/or
- c. have a frequent, recurring need for the services of the cooperative.

The first two of these factors influence the ease or difficulty of obtaining consensus among a group of people. The third factor has been cited by Robert Axelrod in a pathbreaking book on generic cooperation (i.e., people getting along) as the overriding feature stimulating cooperative behavior in a wide variety of situations.¹⁴ Evidence to support this point is apparent from examining the market-share statistics for cooperatives in various industries in the U.S. Cooperatives' share for frequently-used supplies such as fertilizer petroleum, and chemicals is over one-third. On the other hand, their share for building materials and farm equipment, important inputs that are not bought frequently, is only about 6 and 2 percent, respectively.¹⁵

2. "Wait-and-see" behavior should be discouraged.

Some farmers may be reluctant to join an emerging cooperative preferring to wait and see how it does. Because of the need at the outset to exploit economies of size and peg the correct scale of operation, latecomers are much less valuable to a cooperative than are those present at the outset. Membership policies should be structured to reward those who commit at the outset.

3. Membership contracts should be written to encourage long-term commitment of members.

Commitment of members is naturally crucial to maintaining efficient use of the cooperative's operations capacity and to maintain a reliable flow of product in the case of a marketing cooperative. Member commitment is discussed in more detail in the next subsection.

3. Long-term membership policy.

Here we address matters of building commitment among members and whether a cooperative should have an *open* or closed membership.

On the surface, building commitment to the cooperative among members should not be a problem. If the cooperative is satisfying economic needs of the members, their continued patronage should be assured. Matters are not so simple, though. A well-run cooperative needs to take a long-run perspective to its business which includes investing funds in market development, plant maintenance and/or expansion, research and development, etc.

It is possible, even likely in some years, that noncooperative handlers will be able to offer better short-term deals than a cooperative operating with a long-run perspective. In product marketing this tends to occur during tight-supply, high-price years.

If members do not reliably patronize a cooperative, the organization's ability to develop market outlets and efficiently utilize its plant capacity is limited. Thus, just as the cooperative needs to take a long-term perspective, so do farmers with respect to their cooperative membership.

Long-term contracts are one way to encourage member commitment. Five year contracts are common for many large U.S. marketing cooperatives. Of course, contracts can be broken, and it will usually not be prudent for a cooperative to instigate litigation against its wayward members. The alternative is to write the membership contracts so that they prescribe the specific levels of patronage that are expected and set forth specific penalties for failing to meet these standards. Patronage standards are best stated in terms of specified volumes of purchases or sales with clauses to release the commitment if, for example, the member experiences crop failure.

Common and appropriate penalties for failing to meet a commitment are:

1. Loss of membership for a specified number of years without explicit approval of the Board of Directors.
2. Loss of rights to payment from the cooperative's revolving fund. (This point is discussed further in the next section on financing.)

We now turn to address policy towards new members. An open membership is when any farmer meeting certain standards has the right to membership; a closed membership is when no new members

¹⁴Robert Axelrod, *The Evolution of Cooperation*, Basic Books, New York, 1984.

¹⁵Cooperatives' share statistics are from Charles Kraenzle, "More Farmers Turning to Cooperatives for Production Supplies, Marketing," *Farmer Cooperatives*, 49, February 1983, pp. 18-19, and Roger Wissman, "Co-op Share of Farm Marketing, Major Supply Purchases Climb," *Farmer Cooperatives*, 50, April 1984, pp. 18-19.

may join. Cooperatives have had a tradition of open membership. In fact, open membership is sometimes listed as a defining characteristic for cooperatives, e.g., it is one of the so-called "Rochdale principles."

However, cooperatives do normally have a legal right to restrict membership, and there is no reason not to use membership policy as a tool to increase the cooperative's chances for success.¹⁴

From a long-term perspective, increasing membership will normally be good for a cooperative because of the resulting economies of size. Reasons to limit membership in the short-term are threefold:

1. If the cooperative is operating near its efficient capacity, new members would tend to increase operations beyond the efficient capacity, thus raising costs.
2. For a marketing cooperative, the volume of product that can be sold in any season is often limited by sales contracts. Thus, the cooperative may have no sales outlet for the additional product supplied by new members. At best, new sales may only be achieved at discount prices.
3. New members may not be able to meet adequate quality standards.

Quality may relate to the physical quality of the product being delivered or it may relate to the potential member's "quality." For example, if some growers could not be counted upon to reliably deliver the product, it would hinder the cooperative's ability to meet marketing commitments and exploit economies of size. As to product quality, it is difficult and costly in many processing operations to grade individual producers' products for quality. If everything gets lumped together and the cooperative gets paid based upon the average quality, the high-quality producers end up *cross-subsidizing* the low-quality producers.

Our research suggests that this problem has been a major source of member discontent in many marketing cooperatives. Thus, unless grading schemes for individual production can be conveniently instituted, the cooperative is probably wise and justified in excluding low-quality producers.

A fourth, long-term reason to restrict membership is when a cooperative is trying to control the

overall flow of product to the market. As discussed in Part 1, this strategy will be effective only if no alternative marketing outlets are available for those denied membership in the cooperative.

4. *Nonmember business.*

Many cooperatives conduct business with nonmembers. A recent national survey of farmers indicated that about 16 percent patronized cooperatives as nonmembers.¹⁷

Accepting nonmember business gives a cooperative flexibility, and in general, is probably a good idea. Most, but not all of the new cooperatives in our survey were willing to accept nonmember business. In nearly all cases, the reason given was related to better utilization of capital or simply a matter of needing the business.

The advantage of the flexibility afforded by nonmember business is that the cooperative, by regulating its intake of nonmember business, can influence the volume of business it transacts without making a long-term commitment. Thus, during low-supply, high-price years a marketing cooperative would be advised to seek nonmember business as a way of maintaining efficient utilization of plant capital and satisfying marketing sales commitments. During high-supply, low-price years, the cooperative would not accept nonmember business.

The main risk to accepting nonmember business is that it may discourage membership. Some farmers will be unwilling to commit to membership if they can secure most of its advantages as nonmembers while avoiding financing and commitment responsibilities. Thus, it is important that the cooperative make choosing membership the more preferred alternative to nonmember status for most farmers. The reason, of course, is that members with a long-term commitment are vital to planning the optimal scale of operation and securing marketing sales commitments.

The two main ways for a cooperative to make membership the generally preferred way of doing business are to

1. offer no guarantees from year to year to accept nonmember business, and
2. pay *patronage refunds* only to members.

¹⁴Good sources of legal information on organizing cooperatives are Israel Packel, *The Organization and Operation of Cooperatives*, American Law Institute, Philadelphia, 1970; Morrison Neely, *Legal Phases of Farmer Cooperatives*, U.S. Department of Agriculture, Farmer Cooperative Service, Information Report No. 100, 1976; and James P. Baarda, *State Incorporation Statutes for Farmer Cooperatives*, U.S. Department of Agriculture, Agricultural Cooperative Service, Cooperative Information Report No. 30, 1982.

As to the question of limiting membership, Packel (p. 94) says that membership cannot be arbitrarily denied, but denial can occur if the cooperative can demonstrate that existing members would incur a loss were new members allowed. There are exceptions when membership cannot be denied, for example, when the cooperative provides an essential service such as electricity.

¹⁷Paul Wilkins, *Marketing and Farm Supply Cooperatives: Membership and Use, 1980*, U.S. Department of Agriculture, Agricultural Cooperative Service, ACS Research Report No. 28, May 1983.

Patronage refunds are the payments made by the cooperative to allocate monies after all costs of doing business have been covered. Retaining the income from nonmember business not only tends to encourage membership but it also is a way of building revenues for the cooperative. Most of the cooperatives in our survey who accepted nonmember business did, in fact, retain the income from nonmember transactions.

Federal statutes and some state laws place restrictions on nonmember business, so before any particular strategy towards nonmembers is adopted, the relevant restrictions must be researched. At the Federal level, several statutes specify that the volume of nonmember business may not exceed that conducted with members. Section 521 of the Internal Revenue Code contains this restriction and also specifies that members and nonmembers be treated the same. Thus, a cooperative that wishes to qualify for section 521 tax status must allocate patronage refunds to nonmembers.¹⁴

State laws may not conform to Federal law on the topic of nonmember business. For example, nonmember business is prohibited in some states, while other states require that patronage refunds be given *only* to members.¹⁵

B. Optimal vertical integration in a cooperative.

Farmers will observe the effects of market failure at the farm gate, that is, in the level and variability of prices they pay or receive. We saw in Part I how such market failure might be corrected by a cooperative. But an important organizational question is how far upstream or downstream into the market flow of Figure 1 must a cooperative integrate in order to correct the market failure?

For example, if farm fertilizer prices appear too high, the problem might be caused by only one or two retail sellers in a remote rural area. Alternatively, it might be caused by the market power of fertilizer manufacturers with retailers merely passing on the inflated prices. *A successful cooperative must integrate to the stage or stages in the production flow where the market failure is occurring.* In the fertilizer example, if the high prices were caused by manufacturer market power, a cooperative organized to sell farm supplies including fertilizer at retail would be ineffective. It would have little choice but to pass on the inflated

fertilizer prices it was charged by the manufacturer(s).

As a very rough rule of thumb, market power is most likely at the manufacturing stages both upstream and downstream from the farm. These stages are capital intensive with relatively few firms and high sunk costs acting as an entry barrier. Market power at the farm gate may also be a problem in rural areas with only a few sellers or buyers.

Having to integrate back into input manufacturing to correct for high prices at retail need not be as discouraging a prospect as it might seem. A number of large cooperatives already operate in these markets and have what is called a *federated* structure. That is, other cooperatives called *locals* are their members. Thus, farmers who face unsatisfactory prices for retail farm supplies may need only form a local retail cooperative which can then apply for membership in a *regional* or federated cooperative to obtain the right to purchase supplies at cost from the regional.

The key point to this subsection is that market failure at any stage in the production chain will probably be transmitted through the chain to adversely affect farmers. A cooperative will successfully counteract the market failure only if it is organized to address the market failure. In general this will require integrating into the stage or stages where the market failure occurs. As noted, this integration may be accomplished through a federated local-regional organization.

C. Decision making.

We wish to discuss two points here: voting and management.

1. Voting.

Major decisions of the cooperative including the election of members to the Board of Directors will be made by a vote of the members. Cooperatives traditionally operate on the basis of one person, one vote. Nearly all of the over 60 cooperatives responding to our mail survey employed this system of voting. In fact, some states require use of the one person, one vote system.

However, some cooperatives have adopted more flexible voting systems, and, if the law allows deviation from one person, one vote, such modifications ought to be considered to help attract the largest-volume farmers as members. Large farmers can be critical to the success of a cooperative because they provide the lion's share of the business volume

¹⁴Section 521 grants certain exemptions from income taxation for qualifying cooperatives. The section 521 exemptions are in addition to the income-pass-through-to-members provision allowed in subchapter T of the Tax Code and discussed in Part I here. See Neely and Baarda, Schrader and Goldberg, and Sexton and Sexton *supra* note 3 for more details on the income taxation of cooperatives.

¹⁵See Packel, Neely and Baarda *supra* note 16.

needed to exploit the economies of size in production and marketing described earlier. Yet cooperatives have had increasing difficulty attracting large farmers as members.²⁰

Because a member's financial contribution to a cooperative is usually roughly proportional to the volume of business transacted with the association, large farmers tend to have the largest financial stakes in a cooperative. Yet if one person, one vote is used, the largest farmer has the same decision making power as the smallest.

The concern is that large farmers will think this allocation of power to be unjust and take their business elsewhere.²¹ The alternative voting system that swings the pendulum in the absolute opposite direction is to base voting power in proportion to patronage levels. This alternative, of course, eliminates any semblance of voting power for the smallest growers and may discourage them from seeking membership. This, too, is potentially troublesome because obtaining the *collective* business volume of small farmers may also be significant to the cooperative's success.²²

A voting system that tends to protect both large- and small-volume members is to grant one vote to everyone and then allow additional votes based on patronage up to some maximum. With this system everyone has some voice, but no one's is too loud in the sense of having undue influence. Considering a system of this type will be especially important when there is a large size diversity among the farmers who might be attracted into a new cooperative.

2. Management.

A cooperative, like any other business, must be well run to be successful. The simplest way to achieve good management is to hire professional management with specific expertise, if possible, in the relevant industry.

Our statistical analysis of the reasons for success or failure among the new cooperatives in our survey found the presence of a full-time, professional manager to be one of the most significant predictors of success (see Part 3). Of course, professional managers do not come cheaply, a fact which highlights the

importance of attaining a sufficient business volume to justify a manager's salary.

Another concern of some analysts is that management may not be inclined to run the cooperative in the member's best interests.²³ The reason for concern is that there is no good barometer of management's performance in a cooperative. In ordinary corporations, the value of the company's stock performs this role. The stock price goes up as the company makes more money and vice versa. In this way, management's performance can be monitored, stock options can be made part of management's compensation package as an incentive feature, and poorly performing companies are vulnerable to outside takeover and displacement of present management—a further incentive to good management.

Because cooperatives either have no stock at all or have stock that is not actively traded, the stock price cannot be used to induce good managerial performance. This deficiency, in turn, places increased importance on the board of directors in a cooperative as a device to insure that management pursues members' best interests.

A final point concerning management is that managers should recognize that cooperatives are different from the ordinary corporations they probably were trained to run. A natural inclination is to run a cooperative the same way an ordinary corporation would be run.

This strategy is dangerous because running the cooperative as an independent "profit center" will not be in members' best interests. The reason is that the cooperative's "profits" will come from charging members too much on their farm supply purchases and/or paying members too little on farm product sales. Even if members eventually get the "profit" back in the form of patronage refunds, a cost is still incurred because economic decisions will have been based on incorrect price signals. Thus, common measures of performance in noncooperatives such as return on equity are not appropriate measures of performance in cooperatives.

As Section III describes, a cooperative should be run so as to *jointly optimize* the performance of the cooperative and the members' farms. To be able to

²⁰See Wilkins *supra* note 17.

²¹Some authors have also argued that small farmers may vote for unwise investment proposals at the expense of their larger colleagues who will end up footing most of the bill through their large patronage volume. See Richard Caves and B. C. Peterson, *Cooperatives' Shares in Farm Industries: Organization and Policy Factors*, Harvard Institute of Economic Research, Discussion Paper No. 974, March 1983.

²²The fastest growing farm-size classes in the U.S. are the smallest and the largest. Small farms are increasing due to the popularity of part-time farms and the increased consumption of fresh fruits and vegetables often grown on small, labor-intensive farms. Both the smallest and the largest farmers are less likely to be cooperative members than their intermediate-size counterparts.

²³For example, see John M. Staatz, *A Theoretical Perspective on the Behavior of Farmers' Cooperatives*, Ph.D. Thesis, Michigan State University, 1984, pp. 106-109 especially.

operate a cooperative effectively, professional managers must initially come to grips with the fundamentals of cooperatives as a distinct business organization. Thus, if management has little prior experience working with cooperatives, members should actively encourage management to participate in cooperative training and education programs.²⁴

II. Financial Keys to Success.

In this Section we explore equity generation for a new cooperative, on-going equity acquisition and redemption plans, debt financing, and the use of grants in developing a cooperative.

A. Generating initial equity.

A major characteristic that distinguishes cooperatives from other businesses is that patronage and not capital is the residual claimant. Thus, members receive income roughly in proportion to their business volume with the cooperative and not based upon their monetary investment in the association.

This facet of a cooperative's operation tends to make it difficult to generate the equity capital needed to launch a cooperative. The reasons are twofold:

1. The pool of potential equity contributors is limited to the potential membership. Outside investors will not find cooperative investments attractive.
2. Even among the pool of potential members, individuals may have incentive to invest as little as possible because their benefit from the cooperative may not be tied to their investment level.

The first reason is due simply to the fact that capital invested in a cooperative earns either a limited return or no return at all. Thus, while an entrepreneur launching a corporation can seek investors world wide, an emerging cooperative must be financed by the members.²⁵

The possible tendency for underinvestment among members is due partly to a *free-rider* problem; because capital investments earn little or nothing per se, members may try to limit their own contributions and "free ride" on others' investments if they can do so and still retain patronage privileges.

As we will describe shortly, the free-rider problem can be overcome by tying patronage rights in the cooperative to the provision of equity capital. However, a second problem remains due to the limited resaleability of cooperative investments.

Normally investments in a cooperative including the right to membership cannot be sold except possibly back to the cooperative at par value. Unlike investors in ordinary corporations who can capture the value of the company's future earnings potential merely by selling their stock, investors in cooperatives benefit from their investment only as long as they maintain patronage with the association.

Thus, the logical incentive for members is to pressure the cooperative to take a short-run view of the business and maximize current benefits to members even though such a policy may be detrimental from a long-term perspective. Such behavior is known as the *horizon problem*.

The keys to successfully capitalizing a new cooperative are, thus, to find methods that overcome members' tendency to free ride and obviate the horizon problem.

Once cooperatives are operational, the usual system of retaining a portion of each member's patronage refund or adding a fixed charge for capital accumulation per unit of business transacted (a *per-unit retain*) does a good job of overcoming the free-rider problem because members' capital contributions are aligned with their patronage levels.

The free-rider problem, though, can be serious when a cooperative is attempting to get its initial infusion of equity. Two alternative systems may be used: Members may be required to purchase stock in the cooperative, or they may be charged for what amounts to a membership certificate. If a cooperative does not issue stock it is known as a *nonstock cooperative* as opposed to a *stock cooperative*.

The legal distinction between the two systems is usually quite unimportant, but we believe the non-stock approach best reflects the economic rationale to join a cooperative which is to secure patronage rights. Thus, if members are required to purchase a membership certificate, it is clear what they are purchasing—a right to patronage. Alternatively, requiring the

*Training programs for cooperatives' directors and managers are often offered through the cooperative extension component of land grant universities. Other training programs are sponsored by U.S. Department of Agriculture's Agricultural Cooperative Service, and the American Institute for Cooperation, both headquartered in Washington, D.C.

²⁵A relatively recent concept in financing cooperatives that addresses the limited equity pool problem is to involve the cooperative with one or more limited partners. The partners may or may not be members or employees of the cooperatives. The partners purchase capital facilities and lease them to the cooperative. The cooperative is provided the opportunity to buy the partners out after a specified number of years. The cooperative usually retains day-to-day control under these arrangements, but the partners also usually have guarantees, in the form, for example, of a professional management contract, that the association will be run so as to protect their investment. Examples where the partnership concept has been tried include several emerging cable TV cooperatives and Pacific Coast Producers, a California fruit and vegetable processor.

purchase of nonincome-earning stock can confuse members' rights as owners versus their rights as patrons.

To prevent free riding, the membership charges need to be made roughly proportional to a member's expected patronage in the association. Some cooperatives, for example, have charged equal membership fees to everyone which surely discourages participation by smaller producers.

The way to make these charges roughly proportional to expected patronage is to base them on an *easily observable, fixed asset*, which is itself roughly proportional to patronage. Acreage is an obvious proxy for expected patronage in a developing marketing cooperative. Information on past marketings or purchases, if available, should also represent a good proxy of future patronage.

Even with this system, some members may attempt to understate their holding of the asset used to allocate the membership fee. The element needed to overcome this attempt at free riding is to place limitations on patronage rights based on the amount of the member's payment for stock purchases or membership certificates. For example, the member who claims to harvest only 100 acres and pays a membership charge based on that amount should only be permitted to sell to the cooperative the typical production from 100 acres unless the member augments his equity contribution.

One final suggestion is to recognize the importance of large producers by making the membership fee somewhat *less* than proportional to expected patronage. A simple way to accomplish this objective is to charge a flat cost to everyone regardless of volume and then an additional fee based on expected volume. For example,

$$\text{Payment} = a + b(\text{Acres}),$$

in which case the fee per acre,

$$\text{Payment}/\text{Acres} = a/\text{Acres} + b,$$

declines as acreage increases. Values for *a* and *b* are chosen to secure the necessary initial equity infusion. The larger is *a* relative to *b*, the greater is the burden placed on small members and vice versa.²⁶

The simple fact of the matter is that large-volume producers will often be able to get price discounts on

purchases and price premiums on sales from noncooperative handlers. Some modifications from basing financing charges purely in proportion to patronage are probably necessary to attract these producers.

John Staatz in his 1984 doctoral thesis suggests a number of ways to mitigate the horizon problem.²⁷ The three most germane to an emerging cooperative are to:

1. Develop a plan to rebate accumulated equities to members as quickly as possible (a topic covered in the next subsection);
2. Lessen restrictions on members' ability to transfer their membership rights. If a membership can be sold with the farm, for example, its value should become capitalized into the farm's selling price. Also transfer of memberships among generations of the same family should be allowed;
3. Allow members to sell per-unit retain and patronage refund certificates to outside investors.

There are apparently no statutory restrictions on the saleability of membership rights or retained equities in a cooperative. Thus, the cooperative is relatively free to impose whatever restrictions it wishes in its bylaws. Specific concerns with allowing trading of membership rights and equity certificates is that it will raise accounting costs for the cooperative and possibly compel the cooperative to incur costly fees to register with the Securities and Exchange Commission.²⁸

B. On-going equity acquisition and redemption.

Once a cooperative is able to begin operations, an on-going source of investment capital is provided by retaining a portion of members' patronage refund or by charging a per-unit capital retain. If members consent, the retained patronage refunds and the per-unit retains are taxable income to the member and not the cooperative. Because there is usually a net benefit

²⁶Technical issues with respect to establishing this type of fee structure are discussed in Pinhas Zusman, "Group Choice in an Agricultural Marketing Cooperative," *Canadian Journal of Economics*, 15, May 1982, pp. 220-234, and Richard J. Sexton, "The Formation of Cooperatives: A Game-Theoretic Approach with Implications for Cooperative Finance, Decision Making, and Stability," *American Journal of Agricultural Economics*, 68, May 1986, pp. 214-225.

²⁷See Staatz *supra* note 23.

²⁸See David W. Cobia, Roger Wissman, William J. Monroe, Francis P. Yager, and Elmer Purdue, "Equity Redemption: Issues and Alternatives for Farmer Cooperatives," ACS Research Report No. 23, U.S. Department of Agriculture, Agricultural Cooperative Service, 1982.

to the member/owners from this tax treatment (see Part 1), the bylaws should include a clause consenting to this treatment.²⁹

The main problem with this system of equity accumulation is that it may cause discontentment among members who pay income tax on monies they do not immediately receive and who periodically get notices of allocation of refunds that they are unable to convert into income.

Thus, even though patronage refund retentions are a convenient and generally fair way to accumulate equity, some of their provisions may be unpopular with members, particularly those who are not very familiar with cooperatives. The concern is that this unrest can induce members to leave the cooperative, causing the adverse consequences described in Part 2, Section IA of this report.

Thus, some suggestions are in order to minimize the unpopularity among members of the equity accumulation programs:

1. Have a visible plan in place to revolve retained equities back to members.
2. Be certain that members receive a sufficient cash refund to cover their income tax liability for both the cash and noncash portions of the refund.

In our survey of newly formed cooperatives, the presence of a plan to revolve retained equities to the members was positively correlated with success of the cooperative. Although students of cooperatives have been calling for increased development of these plans among cooperatives,³⁰ many cooperatives have no plan in place. Among our sample of new cooperatives, 62 percent claimed to have a plan in place. However, nationwide it has been estimated that only about one-third of U.S. cooperatives have a systematic plan to revolve out retained equities and 29 percent have no plan at all.³¹

The structure of equity redemption plans is explained in detail elsewhere,³² so only a few points crucial to cooperatives' success will be mentioned here.

Most systematic equity redemption plans refund equity after five, seven or ten years.³³ The idea is that

once a cooperative has acquired a sufficient equity base, it can begin refunding old equities and replacing them with new ones. The trade off a cooperative faces is that the more rapidly it revolves out retained equities, the greater the rate at which it must acquire them in order to maintain a sufficient equity base. In other words, a plan with relatively few years from retention to redemption must have a higher percentage rate of retention to generate the same equity base as a plan with a longer period between retention and redemption.

The specific advantages to having an equity redemption plan are mainly in the area of member relations and include the following:

1. Timely redemption diminishes the horizon problem discussed in the prior subsection.
2. A timely, visible redemption plan will cause farmers to include their prospective refund as part of the benefit from cooperative membership.
3. Receipt of refunds can be limited to those who meet their contractual obligations to the cooperative as discussed in Part 2, Section I.
4. A moratorium on repayments can be instituted by the Board of Directors if financial conditions compel such action. Thus, the mere presence of a plan need not commit the cooperative to payments that will jeopardize its financial health.

As to member tax liability for retained patronage refunds, the main problem occurs when the cash portion of the refund is not sufficient to cover the income tax on the entire allocation. Most cooperative members are sole proprietorships whose farm income is taxable on their personal income tax return. Under the current tax law the top personal rates are about 30 percent. Thus, if 30 percent or more of the refund is in cash, the tax liability will be covered and member relations will be improved.³⁴

C. Debt finance.

Use of debt has varied widely among cooperatives. For example, in 1962 41 percent of all

²⁹At least 20 percent of the patronage refund must be paid in cash to secure this tax treatment, but the entire amount of the per-unit retains may be retained. There may occasionally be advantages to not qualifying patronage refunds for taxation to the members and, instead, paying tax on them at the cooperative. See Jeffrey Royer, "Cash Flow Comparisons of Two Methods of Allocating Cooperative Patronage Refunds," Paper presented at the annual meeting of the American Agricultural Economics Association, August 1987.

³⁰See Cobia *et al.* *supra* note 24.

³¹P. F. Brown and David Volkin, "Equity Redemption Practices of Agricultural Cooperatives," FCS Research Report No. 44, U.S. Department of Agriculture, Farmer Cooperative Service, 1977.

³²See Cobia *et al.* *supra* note 28.

³³Plans that revolve equity only at the time of a member's death or retirement or only at the discretion of the Board of Directors are not systematic. They do little to solve the problems we have been describing.

³⁴See *supra* note 29.

cooperatives had no debt whereas by 1976 that number had fallen to 21 percent.*

On the other hand, because of cooperatives' equity generation problems described in Section IIA, some cooperatives have placed heavy reliance on debt. Neither of these extreme debt postures are likely to be prudent. However, the optimal debt to equity or debt to asset ratio varies considerably among various industries. For example, in the agricultural implement and machinery industry, the median debt to equity ratio is 33.5 percent, while in agricultural chemicals, it is considerably higher, 53.6 percent.

Table 2 reports the distribution of assets among equity capital, debt capital, and other liabilities (accounts payable, proceeds payable, and deferred and accrued items) in 1976 for U.S. cooperatives classified by type. A fair amount of variation in reliance upon debt is evident for the cooperatives. Marketing coop-

Table 2. Debt and Equity for U.S. Agricultural Cooperatives: 1976

Type of Cooperative	Percentage of Total Assets Represented by		
	Equity capital	Borrowed capital	Other liabilities
Farm supply	50.6	28.3	21.1
Marketing	35.0	35.5	29.5
Cotton & products	38.2	43.0	18.8
Dairy products	35.4	22.6	42.0
Fruits & vegetables	30.7	44.2	25.1
Grain, soybeans, and products	46.9	28.4	24.7
Livestock & wood	49.7	19.6	30.7
Poultry products	49.2	31.7	19.1
Rice	38.4	38.4	23.2
Sugar products	33.9	41.9	24.2
Other products	44.5	19.6	35.9
Total	41.7	33.1	25.2

Source: Griffen *et al.*, *supra* note 35.

eratives tend to rely more heavily upon borrowed capital than do supply cooperatives.

The key criterion in borrowing is, of course, the debtor's ability to make payments on interest and principal. Inability to meet payments is an immediate harbinger of bankruptcy and failure. Reliability of a business's income stream net of variable costs is, thus, the key factor in determining its ability to take on debt. For example, banks and utilities usually

have among the highest debt to equity ratios because their income streams tend to be very stable. As we have noted, agricultural industries tend to be comparatively risky, often experiencing wide fluctuations in income.

This consideration suggests two policies relevant to debt finance:

1. Agricultural cooperatives should rely less heavily upon debt than firms in more stable industries.
2. Whatever strategies can be undertaken to stabilize a cooperative's income stream net of variable costs will both enable it to take on proportionally more debt and reduce the risk of default for any level of debt.

Some of our previous discussion provides the keys to promoting income stability. The main element is to have a stable membership with committed patronage. Involving the cooperative in marketing or selling several products will also stabilize a cooperative's income stream if the income streams are negatively correlated as discussed in Part 1, Section IID.

Cooperatives have access to most of the same sources of debt financing as ordinary corporations plus one additional source. The Banks for Cooperatives (BCs) are lending institutions organized specifically to provide loans to cooperatives.

The BCs are themselves cooperatives; being owned by the cooperatives they serve through capital stock investments. There are 12 district banks plus one central bank. The BCs obtain funds to loan from the sale of securities to private investors. They are not government funded, but are supervised as part of the Farm Credit System. This link tends to make their securities relatively safe investments and usually enables the BCs to obtain favorable interest rates which they can then pass on to their borrowers.

The interest advantage that the BCs can offer their member borrowers varies with economic conditions, but the evidence suggests that a 10 to 25 percent savings relative to commercial bank rates is usually achieved.* Thus, the first suggestion relative to debt finance for organizers of new cooperatives is to explore funding opportunities with the BC in their district. Better interest rates is one obvious reason, but a second reason is that the people at the BCs understand cooperatives and may provide an important source of expertise to an organizing cooperative.

Cooperatives have apparently realized that the BCs are a good lender for them. As Table 3 indicates,

*Nelda Griffen, Jeffrey S. Royer, Roger A. Wissman, Dennis P. Smith, Donald R. Davidson, Stephen D. Lurya, J. Warren Mather and Phillip F. Brown, "The Changing Financial Structure of Farmer Cooperatives," Farmer Cooperative Research Report No. 17, U.S. Department of Agriculture, Economics Statistics, and Cooperatives Service, March 1980.

*See Caves and Peterson *supra* note 21, appendix C.

Table 3. Sources of Borrowed Capital for Agricultural Cooperatives: 1976

Source	Percentage of Borrowed Capital		
	Marketing Coop's	Purchasing Coop's	Total*
Banks for cooperatives	72.7	56.1	62.2
Commercial banks	12.4	11.1	9.5
Debt securities	11.6	9.5	18.9
Leases and industrial revenue bonds	0.9	10.4	3.6
Other cooperatives	0.3	5.6	1.9
Other sources	2.1	7.3	3.9

*Total does not necessarily conform to values for marketing and purchasing cooperatives because of cooperatives that perform both marketing and farm supply functions.

Source: Griffen *et al. supra* note 35.

in 1976 the BCs provided over 60 percent of borrowed capital for agricultural cooperatives, while commercial banks provided only about 10 percent. Among the new cooperatives in our study 31 percent indicated use of BC funding while 25 percent obtained funds from commercial banks. The incidence of success, interestingly, tended to be higher among BC borrowers than commercial bank borrowers. The effect was not so strong, however, that we could be assured of its significance in a statistical sense (see Part 3).

Among the other debt sources listed in Table 3, debt securities are debt instruments issued by the cooperative itself. Normally, only established cooperatives with a good financial record will be able to use this source of funds.

Industrial revenue bonds do, however, offer another possible source of low cost funds. Industrial Revenue (IR) bonds (also called industrial development bonds) are long-term debt issued by a local governmental unit (e.g., city or county) to finance the purchase, construction, improvement, or expansion of property, plant, or equipment to be leased or sold to private businesses. Alternatively, the funds can be loaned directly to businesses for the above purposes.

IR bonds are not normally tax exempt like municipal bonds, but they are backed by the stability of the issuing government which enables them to be issued at favorable interest rates with lengthy maturities.

Clearly the purpose of IR bonds is to benefit the issuing city or county. Cooperatives, being organizations normally intended to benefit a large number of

community members, are ideal candidates for IR bond funding. The main advantages to the cooperative are the favorable interest rates and lengthy maturity. A disadvantage commonly cited is more extensive "red tape" than with other debt sources.³⁷

D. Use of grants and technical assistance.

One perspective important source of start up funds for new cooperatives is grants. Among our sample cooperatives, 23 percent indicated receipt of at least one grant, and our statistical analysis of the probability of success in new cooperatives does indicate a positive correlation between the receipt of grant(s) and success.

New cooperatives are good candidates for grants because as small businesses they are eligible for most funding programs (not, however, Small Business Administration loans) designed to aid the start up of new businesses. In addition, they are eligible for programs targeted specifically to cooperatives. Funding sources include both Federal and state governments as well as private organizations such as church foundations. However, eligibility requirements for programs and the range of available programs themselves often change frequently.

The reason grants can be so important to the start up of a new cooperative is that they can effectively provide an additional infusion of equity capital which, as we have noted, is where many new cooperatives tend to come up short. Grants, thus, provide financial *leverage* that can be used to support additional borrowing and, in general, upgrade the organization's infrastructure.

The best advice concerning grants, therefore, is simply this: the range of funding opportunities should be thoroughly explored at the time of initial planning. However, the long-range business plan should demonstrate that the co-op can be successful without continuous grant funding.

Any device, such as grants, that will raise funds or, alternatively, lower costs during the planning and start-up phase of a cooperative must enhance its chances for success. One way to reduce costs is to take advantage of the network of public sector expertise that can be called upon to advise and assist emerging cooperatives. Sources include the USDA Agricultural Cooperative Service, land-grant university extension personnel, farm advisors/county extension agents, and the Banks for Cooperatives. In addition, most states have an agricultural cooperative council—a statewide affiliation of cooperatives—that may provide useful assistance.

³⁷See Donald R. Davidson, "Industrial Development Bond Financing for Farmer Cooperatives," Farmer Cooperative Research Report No. 18, U.S. Department of Agriculture, Economics, Statistics, and Cooperatives Service, 1980.

These sources may not always be able to substitute for costly private legal, financial, and accounting consultation, but very often the people involved will have had extensive experience working with cooperatives and be able to provide extensive advice and assistance at little or no cost.

Among our sample cooperatives, 49 percent reported extensive use of private consultants while the comparable number for the public-sector sources was 78 percent. Our statistical analysis found a positive correlation between use of public-sector consulting and success and a negative correlation between private sector consulting and success.

III. Operating Keys to Success.

In this section we discuss optimal pricing and output policies in cooperatives and how best to judge the performance of a cooperative.

A. Pricing policy.

If business wisdom could be condensed into one phrase, it would probably be "buy low, sell high." The question is how appropriate is this phrase as a maxim for operating a cooperative? In short, the phrase is half right. A marketing cooperative's goal should be to sell members' production at the highest possible price, and it should attempt to perform whatever marketing functions are profitable in the sense of generating incremental revenues in excess of incremental costs. In essence, on the selling side the marketing cooperative should approximately emulate the behavior of other marketing sector firms.

Similarly, a purchasing cooperative in its buying activities will roughly approximate the behavior of its noncooperative counterparts. It should attempt to procure the supplies it sells to farmers as cheaply as possible.

What then is the appropriate pricing policy for a cooperative in dealings with members? One suggestion contained in the original "Rochdale Principles" is that a cooperative should charge "regular retail prices." In other words, the cooperative would emulate noncooperatives' pricing behavior towards members, too. Cooperatives by their very nature must breakeven, so an alternative pricing suggestion has been to charge or pay the price that will roughly match revenues with costs. This is known as *average cost pricing*.

For a cooperative marketing a single product, Q , the break even price, P_M , is given by the net-average-

revenue-product curve identified in Figure 5 of Part 1:

$$\bar{P}_M = (R - C) / V$$

where R is revenues from sales, C is all marketing costs except raw product costs, and V is volume of raw product processed.

For a purchasing cooperative selling an input such as fertilizer, we can set price equal to the average or per-unit costs of providing the input or service:

$$\bar{P}_P = \frac{\text{Total costs for producing and selling the product}}{\text{Amount of product sold}}$$

Average cost pricing will limit the need for patronage refunds, whereas charging regular retail prices will normally result in a profit or surplus that will need to be rebated to members.

Neither of these rules is optimal in the sense of generating the maximum benefit for members from participation in a cooperative. The optimal pricing policy toward members has, however, been known for more than 40 years.³ It involves paying members of a marketing cooperative a price equal to the *incremental or marginal* value of their raw product and charging members of a purchasing cooperative a price equal to the *incremental or marginal* cost of providing the service or supply.

The above rules are known as *marginal value or marginal cost* pricing. They necessarily maximize members' benefit from participation in a cooperative, and, hence, their use can be integral to achieving success in an emerging cooperative. To better understand these rules, suppose a marketing cooperative obtains Q_1 units of raw product from the members. The net revenue, NR , from selling this production in processed form is:

$$NR(Q_1) = \text{Revenues from sales of } Q_1 \text{ units} - \text{All marketing costs for } Q_1 \text{ units except the raw product costs.}$$

Now if the cooperative obtained an additional increment of raw product, it would now process and sell Q_2 units with the increment, ΔQ , equal to $Q_2 - Q_1$. We can compute the net revenue $NR(Q_2)$ from selling Q_2 units using the above formula. The net value of the incremental production is called the *net-marginal revenue product* (NMRP) and is computed as follows:

$$NMRP(Q) = \frac{NR(Q_2) - NR(Q_1)}{\Delta Q}$$

³See Stephen Enke, "Consumer Cooperatives and Economic Efficiency," *American Economic Review*, 35, March 1945, pp. 148-55.

NMRP(Q) is graphically illustrated in Figure 5. Our optimum pricing rule says to set price, P_m^* , equal to whatever is the value of the NMRP for the given volume of raw product:

$$P_m^* = \text{NMRP}(Q).$$

The comparable rule for a purchasing cooperative is to compute the incremental costs of procuring an additional amount of the farm input, say Z. Thus, we have $\Delta Z = Z_2 - Z_1$, and $C(Z_2)$ = total costs of producing and selling Z_2 units, $C(Z_1)$ = total costs of producing and selling Z_1 units. The marginal cost, $MC(Z)$, of the increment is then:

$$MC(Z) = \frac{C(Z_2) - C(Z_1)}{\Delta Z}.$$

A number of problems may hamper implementation of these marginal cost pricing rules. To begin, while common cost accounting procedures make it easy to compute *total* revenues and costs or *average* revenues and costs, the incremental revenues and costs may be harder to discern.

Some simple rules can help overcome this problem, however. A small marketing cooperative can often sell all it wants at a prevailing market price. To get the equivalent selling price for the raw farm product, we divide the *processed product's selling price* (PPSP) by the conversion factor, K, as described in equation (1) in Part 1. Finally, we need to compute the incremental processing and selling costs. Fixed costs for plant, administration, and capital equipment by definition do not change as output varies in the short-run, so they are never part of incremental costs. A rough approximation of the incremental costs is to compute the *average variable costs*, $AVC(Q)$, of processing and selling the raw product:

$$AVC(Q) = [\text{Production labor costs} + \text{Materials costs} + \text{Energy costs} + \text{Other variable costs}] / Q.$$

Our approximate NMRP(Q), and hence, our optimal raw product price, P' , is thus:

$$\text{NMRP}(Q) = P' \approx (\text{PPSP} / K) - AVC(Q).$$

A similar approximation procedure can be used to arrive at the marginal-cost selling price in a purchasing cooperative.

A second problem is that marginal cost pricing does not directly satisfy cooperatives' breakeven requirement. As Figure 5 illustrates for a marketing cooperative, NMRP is greater (less) than NARP, whenever NARP is rising (falling). Because NARP defines the breakeven price, it follows that pricing according to NMRP will result in a deficit (surplus) when NMRP is greater (less) than NARP.

The analogous results for a purchasing cooperative are that charging a price for inputs or services equal to their marginal cost results in a deficit (surplus) if per-unit costs are falling (rising).

This problem is also less vexing than it initially appears. The reason, as noted previously, is that flexibility in pricing is one of cooperatives' important organizational advantages compared to noncooperatives. Thus, what we need to augment the marginal cost prices described above is an additional set of charges or rebates to enable the cooperative to balance its books.

If marginal cost pricing is expected to result in a deficit, the additional necessary revenue can be obtained from annual membership charges structured according to the criteria discussed in Section IIB. Surpluses can be refunded through the usual system of patronage refunds, but one problem is created. Rebating strictly according to patronage causes the pricing scheme to degenerate into average cost pricing which as we have noted is not optimal. The preferred alternative would be to return surpluses in the form of a rebate on the membership costs where the membership fee is set up as described in Section IIB.

The final problem with implementing the pricing policy described here is due to people's general ignorance concerning the distinct organizational and operational features of a cooperative. Potential creditors, in particular, may expect a cooperative to operate similarly to ordinary corporations. They may be unwilling to loan money to a cooperative that openly expects to accrue a deficit to be covered with a set of membership charges. If in this sense the world is not ready to accept cooperatives being operated as they should be, a cooperative may have to modify its behavior to fit others' preconceptions.

B. Output policy.

This section is concerned mainly with the question of whether a marketing cooperative should try to actively influence its members' production levels, or, instead, passively act as a "home" for whatever the members produce. We begin by noting that improved communication and information flow is one of the organizational advantages of cooperatives discussed in Part 1. Thus, at minimum, cooperatives ought to employ this advantage to communicate information about market conditions to members and, in turn, to receive information from members on production plans, harvest schedules, etc.

Coordination between the cooperative and the membership as to desired product characteristics and harvest times can both improve quality and cut

costs by promoting efficient use of processing facilities.

Whether a cooperative should pursue a more active role in regulating members' production depends on a number of factors:

1. Does the cooperative have any significant influence on the prices it receives?
2. Is the cooperative restricted as to the amount it can sell at a given price?
3. Can the cooperative keep product off the market?
4. Is plant capacity a concern?

As we noted in Part 1, marketing cooperatives may have some influence on their selling price if they control a sizable share of production in a local or regional market. When markets are national or international in scope, influencing price is possible only for the largest, most powerful cooperatives.

If a cooperative does market a significant share of production in the relevant market, its opportunity to influence price depends on its ability to keep product off the market. Merely limiting the amount of product it will accept from members will not raise market prices if the members can turn around and sell their surplus production through other channels.

For example, cooperative cotton gins often sell cotton seed to milling cooperatives through a federated structure. The mills buy seed from the gins and process it into oil and meal or sell it as whole seed. However, many gins also sell whole seed directly. Obviously, any attempt by the mills to regulate the flow of whole seed would be rendered ineffective in these markets due to the selling activities of the gins.

Thus, our first occasion to consider restricting member deliveries is when the cooperative can raise price by restricting output and can keep the surplus production off the market. Of course, the cooperative must communicate to members in advance the volume of production it will accept from each. Members can then divert resources into other types of production.

Although it may seem harsh to deny members a home for their production, it is important to understand that the price increases obtained can more than compensate them for the lost production. It should also be understood that volume restrictions must be made binding to accomplish their intended goal. Voluntary programs will be rendered ineffective by free riders.

A second occasion to restrict deliveries is if the cooperative's selling opportunities are limited. In some industries, sales are governed by long-term contracts, so a cooperative's selling opportunities may be known well in advance of production. In these cases, if surplus production cannot be sold or

can be sold only at a substantial discount, the sales limitations should be communicated to members via restrictions on their raw product deliveries.

These first two reasons to restrict member deliveries are demand related. The final reason is due to production costs. Modern plants, especially capital intensive ones, are geared to efficiently operate at a given volume level. Deviations from the efficient volume cause costs to rise rapidly as illustrated in Figure 6.

If the cooperative has reached its efficient operating capacity, it should restrict member deliveries in the short-run until it can add additional capacity.

The point with any of these reasons to deny members a "home" for their production is that such a denial is in their mutual best interests. If delivery restrictions are clearly communicated in advance, members can either find alternative market outlets or alternative products to produce. Meanwhile, their net revenue per unit from the cooperative will be higher than if the surplus production had been dumped at the cooperative's door.

Acting as a "home" for members' production is good member relations and, thus, it should be the prevailing policy, unless one of the three reasons cited above is compelling.

C. Evaluating a cooperative's performance.

Once a cooperative has been developed, the members must judge its performance to determine if the organization is, in fact, accomplishing the objectives that led to its formation. The question for members individually and collectively to ask is, "am I (are we) better off with the cooperative than without it?" This question can only be answered from a reference point, and two are available:

1. the members' economic well-being before the cooperative was developed;
2. the economic well-being of farmers who chose not to join the cooperative.

The key point about either of these comparisons is that they ordinarily must be made from a long-term perspective. Only in a few isolated instances will the advantages or disadvantages of a cooperative be immediately apparent. Reasons why a long-term evaluation is needed are that:

1. Most businesses, cooperatives included, do not perform at peak potential in their first year or two.
2. Many factors completely unrelated to the cooperative can cause farm prices to rise or fall. Thus, to avoid erroneously attributing random price effects to a cooperative, members must evaluate price performance over

the long-run when random shocks should average out.

3. In the first few years of operation the cooperative will need to retain a large portion of earnings for investment purposes. Moreover, any plan to rebate retained equities will not have "kicked in" yet. Thus a cooperatives' price performance may look misleadingly poor in the initial years.

Another factor to bear in mind when judging a cooperative's performance relative to a noncooperative counterpart is that the presence of the cooperative may have caused other firms in the industry to behave more competitively, that is, to offer higher prices and/or charge lower prices. This possible procompetitive effect of cooperatives has been called the competitive yardstick, and it has an element of free ridership attached to it; nonmembers effectively may gain many of the benefits of the cooperative due to the noncooperative handlers' more competitive behavior.

In spite of this free rider problem, it is clear that members probably could not disband the cooperative and revert to patronizing the other handlers because the competitive yardstick would no longer be in place.

Notice that in this discussion of cooperative performance evaluation, we have stressed the members' long-term economic well-being compared either to nonmembers or the pre-cooperative era. We have not mentioned any of the indicators such as rate of return-on-equity (ROE) commonly used to judge businesses. These indicators are invalid to judge a cooperative's performance even though they have frequently and erroneously been used for that purpose.

The reason is that it should not be the cooperative's goal to accumulate vast amounts of "profit" and thus, to achieve a big ROI. Profit, of course, would normally be achieved at members' expense by charging too much for supplies and/or paying too little on members' raw product sales. Such behavior as our subsection on pricing has indicated is not in the members' best interests.

Rather, as with any vertically integrated organization, the revenues and costs of the cooperative are accountable to the members, and the well-functioning cooperative operates specifically to benefit its members. Thus, the cooperative's performance must be judged based on the members' welfare after they have received its benefits and paid its costs.

IV. Summary.

Part 2 of our report has focused on the organizational, financial, and operational keys in successfully developing a cooperative once a reason for its existence has been established (Part 1).

Among the organizational keys, attaining as large a membership as possible was cited as an especially crucial factor in enabling the cooperative to exploit economies of size in both production and marketing. Suggestions were made for specific financing and decision making frameworks that would enable the cooperative to appeal to both large and small farmers.

In the area of financing, we stressed that contributing equity to a cooperative was often not an attractive investment per se. We suggested characterizing initial equity contributions as membership fees and further suggested that patronage rights in the cooperative be tied directly to these fees.

As to operations, we stressed that the key feature was to set up price and output policies so as to *jointly optimize* the performance of the cooperative and the member farms. Optimal pricing policies were shown to be those that paid members the *marginal value* for their production or charged them the *marginal cost* of providing supplies. Also, several instances were isolated wherein a policy of restricting member deliveries to a marketing cooperative could be beneficial.

This completes our "blueprint" to success in developing a modern agricultural cooperative. To test and apply the blueprint we turn now to examining the experiences of a number of recently developed American agricultural cooperatives.

PART 3. AN EXPLORATORY ANALYSIS OF RECENTLY FORMED AMERICAN AGRICULTURAL COOPERATIVES

This part of the report describes our survey analysis of the experiences of many recently-formed American agricultural cooperatives. Section I describes our methodology to locate new cooperatives and develop contacts; Section II discusses the survey instrument; Section III reports the main survey results, while Section IV contains a statistical analysis of the determinants of success in new cooperatives.

I. Identifying Newly Formed American Agricultural Cooperatives.

To provide ideas and a fertile testing ground for our cooperative success blueprint, we sought to locate and develop contacts with cooperatives formed in the U.S. and affiliated areas since roughly 1970 onward. This task was complicated because no central directory of these organizations is available. Moreover, many new cooperatives are quite small and not well known.

Our procedure in developing a sample of recently formed cooperatives was to contact and request assistance from individuals and organizations most likely to be aware of recently-formed agricultural cooperatives in the various parts of U.S. Those contacts included:

1. Personnel at land-grant universities with primary responsibilities in the area of cooperatives;
2. Directors of state-level agricultural councils; and
3. Heads of the 12 district Banks for Cooperatives.

Each of these individuals was sent a letter informing him/her of our study and requesting the names, addresses, and contact persons for cooperatives formed since roughly 1970. Because of our interest in success and failure, we were particularly interested in finding organizations that had begun operations since 1970 but had subsequently gone out of business.

The response rate to this request was high, but several people were unaware of any newly-formed cooperatives in their area. Nonetheless, through this network and other contacts, we were able to locate about 150 cooperatives in the U.S. and affiliated territories that met the criteria for inclusion in our study.

Our procedure was then to make telephone contact with one or more leaders of these cooperatives, explain the purpose of the study, and request permission to mail a survey instrument to be completed by the person. The leaders we contacted were either members who were on or had been on the Board of Directors (usually in the capacity of president) or were professional management. Among our respondents, 64 percent were member/patrons of the cooperative and 36 percent were from management.

Contacts were generally willing to participate, and surveys were mailed to people affiliated with 108 different cooperatives. If the survey form was not returned within four weeks of mailing, a follow-up letter and an additional survey form was mailed. This methodology produced a response rate of nearly 60 percent.

II. The Survey Instrument.

Because our survey encompassed both purchasing and marketing cooperatives and both active and out-of-business cooperatives, four survey instruments were designed, one each for active marketing cooperatives, active purchasing cooperatives, no-longer-operating marketing cooperatives, and no-longer-operating purchasing cooperatives.

The methodology involved designing a preliminary set of survey instruments and submitting them to extensive pretesting from case study analyses of several recently-formed California agricultural cooperatives. Personal interviews by either or both of the authors were used in the pretesting phase. Based on the availability of cases in California, the pretesting was skewed towards cooperatives marketing fresh and processed fruits and vegetables. Both active and defunct cooperatives were included in the pretesting.

Final versions of the questionnaires were prepared based upon results from the pretest phase. Cooperatives used in the pretesting phase were not included in the final survey phase for which results are reported here.

Category areas for the surveys were chosen to test, illustrate, and, as appropriate, modify or update the cooperative success blueprint reported in final form in Parts 1 and 2 of this report. Survey questions included the following categories:

1. Basic information on the cooperative including age, membership, products marketed, and position of the respondent;
2. Economic factors motivating the decision to develop the cooperative;
3. Membership factors;
4. Financing issues;
5. Decisionmaking and management; and
6. Evaluation of the cooperative's success or failure.

A copy of the survey instruments mailed to active marketing and active purchasing cooperatives is included at the end of the report. Survey forms sent to leaders of no-longer-active cooperatives differed only slightly to reflect the *ex post* nature of these organizations. Where judgmental answers were requested, we allowed respondents to choose from among three categories: For example, A. an important factor, B. a minor factor, C. not a factor. Whenever appropriate, we encouraged respondents to elaborate upon their answers and left space on the form for that purpose.

III. The Main Results.

A. Characteristics of survey respondents.

Sixty one usable responses were received. Responses emanated from 26 states plus Guam and the Mariana Islands. Hawaii was the most frequently represented state with eight responses, followed by Vermont with six, and California, Minnesota, and Tennessee with five each. A complete distribution of responses by state is provided in Table 4.

The most frequent start up dates for our respondents were 1983 and 1984 with eight beginning operations in each year. The complete distribution of start-up dates is provided in Table 5.

As to the types of cooperatives responding, the most frequently represented function was fruit and vegetable marketing with 22 responses (36 percent) with farm supply cooperatives second most represented with 11 responses. The complete distribution of the sample cooperatives by function is reported in Table 6.

Locating leaders of cooperatives that had gone out of business who were willing to participate in the study was, not surprisingly, difficult. Eight responses from this group were obtained with the remaining 53 coming from cooperatives that were active at the time of the study.

Survey response data for the four main component areas of the questionnaire: economic factors, membership factors, financing, and decisionmaking, are now presented and analyzed in turn.

Table 4. Cooperative Survey Respondents by State or Other Location

State/Location	Number of Responses
Alabama	3
Alaska	1
Arkansas	2
California	5
Florida	1
Guam	1
Hawaii	8
Idaho	1
Kentucky	2
Louisiana	2
Maine	1
Mariana Islands	1
Minnesota	5
Missouri	1
Nebraska	2
New Mexico	1
North Carolina	1
North Dakota	2
Oklahoma	1
Oregon	2
Texas	1
Tennessee	5
Vermont	6
Virginia	3
Washington	2
Wisconsin	1
Total	61

B. Economic factors.

Part 1 in this report documented several economic benefits that cooperatives can prospectively provide their membership. Question 7 on either survey form was designed to capture the importance of each of these factors: Question 7a, "prices were too low (marketing co-op) or too high (purchasing co-op)," was designed to mainly capture market power considerations (Part 1, Section IIB). Question 7b on the marketing cooperative form, "marketing services were not performed effectively," reflects the possibility that the marketing margin may be reduced through cooperative marketing (Part 1, Section IIA). Question 7b on the purchasing cooperatives' form reflects the same idea on the farm input side of the market.

Table 5. Start-up Dates for Cooperative Survey Respondents

Date	Number of Responses
Pre 1970	4
1970	1
1971	1
1972	4
1973	2
1974	4
1975	4
1976	4
1977	2
1978	3
1979	2
1980	3
1981	3
1982	4
1983	3
1984	8
1985	8
1986	1

Question 7c, "prices were subject to too much variability or uncertainty," captures the possible risk-reducing role of cooperatives discussed in Part 1, Section IID. Question 7d on both forms reflects cooperatives' possible role when no private handlers will operate in a market (Part 1, Section IIE) or the similar problem discussed in Section IID that buyers and sellers may be present but cannot be counted upon to meet farmers' buying and selling needs. Question 7e on the marketing form, "individual farmers lacked bargaining power," is intended to capture both farmers' difficulties in dealing with monopsony or oligopsony buyers (Part 1, Section IIB) and their aspirations to raise market prices through

Table 6. Cooperative Survey Respondents by Function

Cooperative Function	Number of Responses
Fruit and Vegetable marketing	22
Farm supplies	11
Animal products marketing	8
Farm services	5
Nut marketing	4
Grain marketing	4
Other marketing	7
Total	61

collective marketing (Part 1, Section IIC). Space was also provided for respondents to list and rank additional factors.

Respondents were asked to indicate whether each of the above considerations was (A.) an important factor, (B.) a minor factor, or (C.) not a factor in the decision to organize a cooperative. The quantitative responses to these questions are reported in Table 7. In addition to indicating the percentage responses to the A, B, and C categories, the table also reports a mean or average rating based on assigning the values 1.0, 2.0, and 3.0 to A, B, and C responses, respectively. Thus, factors with a *lower* mean score were judged to be relatively more important than factors with a *higher* mean score.

The first point to note from the table is that all factors were deemed to be very important or of minor importance by over 60 percent of the respondents. The most important factor for marketing cooperatives was bargaining power which 70 percent cited as a major factor underlying their organizing effort. Representative respondent comments about the bargaining power factor included:

Table 7. Importance of Alternative Economic Factors in the Decision to Form a Cooperative

Factor	Important factor	Minor factor	Not a factor	Mean response
	—percentage responses—			
7a: Prices too low (high)	44.3	23.0	32.8	1.89
7b: Ineffective or poor quality supplies or service	54.1	16.4	29.5	1.75
7c: Price variability/uncertainty	37.7	26.2	36.1	1.98
7d: Undependable/nonexistent market outlet	65.6	9.8	24.6	1.59
7e: Bargaining power (mtg. co-op only)	70.0	10.0	20.0	1.50

- Produce buyers found it easy to pit one farm against another; farmers had no clout.
- Individual farmers lacked quantity to bargain effectively.
- Buyers would tend to take advantage of individual farmers.

Among the farm supply and services cooperatives, the most important factor was undependable or nonexistent source of supplies which 65 percent rated as a very important factor in the decision to organize a cooperative. Representative comments included:

- Plantation stopped selling fertilizer and herbicides to growers.
- No other almond hullers in this area would handle the new producing trees.
- No supplies/services on this island.
- Tractor services were not available.

Although respondents commented extensively in the open response categories (7f and 7g on the marketing form, 7e and 7f on the purchasing form), their responses tended to be restatements of the same basic economic problems suggested in the main response categories.

C. Membership factors.

We were concerned with membership growth from initial planning to start up to current size, the decision to open or close the membership, and policy towards nonmembers.

The response to question 4 concerning the number of producers involved in the initial planning stages confirmed the hypothesis that a few people often end up doing much of the costly preliminary work in a cooperative. Ten or fewer people were involved in 54 percent of the cases and 20 or fewer were involved in 79 percent.

To measure the growth of the membership from the time of initial planning to start up, a growth coefficient (GC) was computed as the ratio

$$GC = \frac{\text{Members involved in initial planning stage}}{\text{Members at the time of initial operations}}$$

The mean value for the growth coefficient in our sample was 0.65, indicating that on average the cooperatives in our sample failed to double in size as they evolved from planning into an actual operating entity. Our statistical results reported in the next section demonstrate that the smaller growth coefficient (i.e., the greater the growth rate) the greater the prospects for success in a cooperative.

Among our sample cooperatives, 72 percent reported having an open membership (question 16a),

Table 8. Reasons for Open or Closed Membership in a Cooperative

	Important Factor	Minor factor	Not a factor	Mean factor response
—percentage responses—				
Open membership:				
More members make co-op run more efficiently	60.7	14.8	9.8	1.40
More members give co-op more bargaining power	60.7	9.8	14.8	1.46
Open membership is the co-op way	54.1	13.1	18.0	1.58
Closed membership:				
More production would cause operating inefficiencies	62.5	0	37.5	1.75
Restrict volume of product on the market	16.7	0	83.3	2.67

while 28 percent indicated otherwise. Open membership is one of the Rochdale principles, but, as was shown in Section IA of Part 2, open membership may not always be the most prudent membership policy. Thus, we were interested in the cooperatives' reasons for having an open or closed membership policy.

Question 17 on both forms was designed to generate this information. For open membership cooperatives, the following factors were offered: more members make the co-op run more efficiently (a physical economies of size factor), more members give the co-op more bargaining power (the market power argument) and open membership is the co-op way of doing business (the Rochdale principle).

Responses were generated using the (A.) important factor, (B.) minor factor, and (C.) not a factor categorization. Percentage responses are summarized in Table 8 along with the mean response based, once again, on the A = 1, B = 2, C = 3 scale. Over 60 percent of the respondents thought that both the economic reasons to keep membership open were important factors, but, interestingly, the Rochdale principle of open membership as a matter of cooperative philosophy was found to be important by 54 percent of the respondents.

Representative comments of respondents concerning the rationale for open membership included:

- We have a limited market; more members gives us more price control; more volume gives us credibility.
- We opened membership when we realized that new members did not have an adverse effect on existing members' [sales].
- More members means more . . . income for advertising and promotion.
- Co-op can most effectively control and stabilize price if most growers are members.
- A large co-op has a better buying power than a smaller one.

Potential reasons to close membership listed in Part 2, Section IA included plant capacity limitations, quality control, and desire to restrict the flow of product on to the market. Because most of the sample cooperatives had open membership, response to the closed membership question was limited but, nonetheless, illuminating. Over 62 percent cited plant capacity limitations as an important factor in their decision to close the membership, while only about 17 percent cited a desire to limit access to the market. This result, in turn, affirms our earlier conclusion that volume restriction is unlikely to be feasible for an emerging cooperative.

Representative comments about the decision to close membership included:

- Having just started operations, the demand for service exceeded our capabilities.
- Processing plant currently at full capacity; capital costs for expansion too costly for anticipated return from product.
- Transportation services offered now to all in the area; more expansion to off line shippers would not help our situation.

Turning now to the issue of nonmember business (questions 18 and 19), 72 percent of our sample cooperatives accepted nonmember business and 28 percent did not. Among those accepting nonmember business, 75 percent retained the income and paid taxes upon it, thus, effectively using the nonmember business as a source of profits. (The decision about whether to accept nonmember business is discussed in Part 2, Section IA4.)

Respondents commented extensively on the reasons for accepting nonmember business with the responses invariably pointing to either of two sound business practices:

1. Using nonmember business to increase plant efficiency, i.e., to exploit economies of size;
2. Using nonmember business to meet sales commitments or unanticipated sales opportunities.

Representative comments on the efficiency argument included:

- Nonmember business brings us to a level of efficient facility utilization.
- More volume would lower unit costs.

On the idea of using nonmember business to generate flexibility in marketing cooperatives' sales, the following were representative comments:

- Because sometimes we can use [nonmember business] to fill a gap and maintain a market.
- To meet contract commitments that members cannot meet.
- Co-op will accept produce only if not available from members.
- If we need it to satisfy customers' needs.
- If we can make a profit on nonmember business, we do it.

D. Financing.

We were interested in several aspects of financing: sources of initial equity and debt capital, extent of use of grants, and whether a plan had been established to revolve retained equities back to members.

Thirty nine of the responding cooperatives (64 percent) indicated use of membership fees or assess-

ments to generate initial equity capital, while 26 (43 percent) reported issuing stock. Purchasing or supply cooperatives more frequently chose the stock approach than did their marketing counterparts. Several cooperatives used a combination of membership fees and stock issuances. We also attempted to generate information on the new cooperatives' sources of additional equity capital beyond the initial infusion. However, response to our question 20 was poor, probably because an accurate answer would have required access to financial statements, and, therefore, no worthwhile inferences could be drawn from it.

As to initial debt capital, 25 percent reported borrowing from commercial banks, and only 19 (31 percent) reported borrowing from the Banks for Cooperatives (BC); even though they usually offer somewhat lower interest rates than commercial banks. One possible explanation for the relatively low usage of the BCs is that they may sometimes be unwilling to accept risks of loaning to new cooperatives. Interesting to note is that 15 respondents listed access to debt financing, especially the BCs, as a very important factor in choosing a cooperative organization rather than an alternative organization form (questions 8 and 9). Thus, even though the proportion borrowing from a BC was not high, most of those who did obtain BC funding attached considerable importance to it.

Nineteen respondents (31 percent) reported obtaining loans from alternative sources. Among those who specified the source, four reported borrowing from members, and five reported receiving loans from state agencies. Five (8 percent) of the sample cooperatives reported having no debt at all.

Only 14 cooperatives (23 percent) reported use of grants as an initial source of funds. Our survey was unable to discern whether failure to obtain grants was due to failure to apply or to applications being rejected. The grants received came from a wide variety of sources:²⁹

Federal agencies	5
State agencies	4
Tennessee Valley Authority	4
Private donors	2

The Tennessee Valley Authority's support was, of course, limited to cooperatives in its Southeastern U.S. service area. All in all the fairly limited use of grants relative to the number of possible available sources indicates that grantsmanship is an area where leaders of new cooperatives may need to focus greater attention.

Thirty eight respondents (62 percent) indicated that the cooperative had a plan in place to revolve retained equity back to members. This figure is probably overstated to some extent because some respondents appear to have confused the payment of patronage refunds with the presence of a revolving fund. The most commonly described plan (eight cooperatives) was nonsystematic and based on the year-to-year discretion of the Board of Directors. Two cooperatives redeemed equities based on a member's age, 65 and 72, respectively.

Among the various systematic plans described, the time from acquisition to revolvment of the equities varied fairly evenly from four to ten years. Some cooperatives with lengthy cycles, e.g., 10 years, indicated plans to speed up revolvment when the cooperative's financial health permitted it. Among the cooperatives with no plan, only a few indicated an intention to develop one.

E. Decision making and management.

Our concerns in this area were with the information and planning that went into the decision to develop a cooperative and whether any alternatives to a cooperative were considered. We were also interested in the nature of voting in the cooperative and its management structure.

As noted in Part 2, Section IID, a prospective advantage to starting a cooperative is that several public sources of information and expertise are available to lend assistance. These include university extension specialists, the USDA Agricultural Cooperative Service, farm advisors or county extension agents, and Bank for Cooperatives personnel. Private consultants, of course, are also available for a fee.

Our question 10 was designed to indicate the extent to which our sample cooperatives made use of the various information sources. Table 9 summarizes the results based on the A. important source, B. minor source, and C. not a source categorization. The mean score reported in the table results from assigning A = 1.0, B = 2.0, C = 3.0.

The most important information source was university extension specialists which over one-half listed as an important source. However, private consultants ranked nearly as high, being cited as an important source by nearly one-half of the respondents.

Those reporting the BCs to be an important information source coincides almost exactly with the number of co-ops reporting BC loans. This result

²⁹Not all respondents listed the grant source, and some listed multiple sources.

Table 9. Information Sources Used in Developing New Cooperatives

Source	Important factor	Minor factor	Not a factor	Mean score
	—percentage responses—			
University extension specialists	52.5	9.8	37.7	1.85
Agricultural Cooperative Service	21.3	23.0	55.7	2.34
Farm advisors/county extension agents	41.0	19.7	39.3	1.98
Bank for Cooperatives	29.5	8.2	62.3	2.33
Private consultants	49.2	14.8	36.1	1.87

affirms our point in Part 2, Section IIC that, aside from providing low-cost loans, the BCs can also provide a source of low-cost expertise.

Frequent use of expensive private consultants relative to the publicly available services which are usually free suggests that some of the new cooperatives may have been overlooking the best values in terms of information and expertise.

Finally, to determine the extent of formal planning for the cooperative, we asked in question 11 whether a financial feasibility study had been conducted. The answer was nearly evenly split: 31 indicating "yes," 30 reporting "no."

A cooperative is not necessarily the only organizational vehicle through which farmers can address the various elements of market failure discussed in Part 1 of this report. For example, farmers who face market power in their sales markets could in principle acquire and operate a marketing firm as either a partnership or a corporation. Special subchapter S corporations are allowed to remit corporate income back to their shareholders for taxation in a similar manner to the tax treatment afforded cooperatives. Question 8 on our survey was intended to see if any of these organizational alternatives had been considered. Mostly the answer was "no." Only three reported considering a partnership, only three considered the subchapter S mode, while 17 considered an ordinary corporation.

The reasons for choosing the cooperative form were requested in question 9. Although this question was to be answered only by those who actively considered alternative organizations, the number of responses to this question was somewhat greater than for question 8. Access to BC funding was listed

as an important factor by 15 respondents, while 14 listed tax considerations. Note that partnerships and subchapter S corporations are taxed similarly to cooperatives, but ordinary corporations would be subject to double taxation (see Part 1, Section IIA). Six respondents cited the prospective membership size as an important factor. Whereas ordinary corporations and cooperatives can have any number of shareholders, shareholder numbers in partnerships and subchapter S corporations are restricted by law.⁴

Voting in our sample cooperatives was almost exclusively done on a one person, one vote basis. Only two respondents reported voting in proportion to patronage. This situation is an instance where the prevailing practice differs from recommended policy contained in our success blueprint. Unless all members are similar in their volume of business, one person, one vote systems threaten to cause discontent among the larger members who are crucial to a co-op's success. However, recall that one person, one vote systems may be unavoidable consequences of state law in some cases.

As to management (question 23), 21 respondents (34 percent) indicated that the cooperative was managed by the producer/members themselves, 36 (59 percent) indicated the presence of full-time professional management, while 6 (10 percent) reported used part-time professional management. (The percentages add to slightly more than 100 percent due to multiple answers on a few of the forms.) Our statistical analysis of the determinants of success in a new cooperative suggests that the presence of full-time professional management is an important key to success. We turn to that discussion now.

⁴A subchapter S corporation can have no more than 35 shareholders. Only individuals, not corporations, partnerships, etc. may be shareholders in a subchapter S corporation. There appears to be no strict legal maximum to the number of partners in a partnership, but the law requires that the co-owners intend to *actively participate* in the trade or business. This proviso clearly reflects a presumption that partnerships will involve a small number of co-owners.

IV. Statistical Analysis of the Determinants of Success in Emerging Agricultural Cooperatives.

A. The success ratings.

The survey respondents were asked to rate their recently-formed cooperative as either a major success, a minor success, too early to tell (about success), or not successful (questions 28 and 31 on the marketing co-op and purchasing co-op forms, respectively).

The results were as follows:

	<u>Number</u>	<u>Percentage</u>
Major success	28	45.9%
Minor success	12	19.7
Too early to tell	10	16.4
Not successful	11	18.0

All of the cooperatives that had ceased operating were classified as not successful.

Representative comments from among those who ranked their cooperative a major success included:

- We have organized 50+ small growers into a single marketing force. Sales are increasing about 25-30 percent per year and membership is growing annually. We have circumvented the market by going direct to chain warehouses.
- We have had two solid years with good prospects for coming years. Membership is increasing. For each of our two years of operation, we have returned 20 percent more to our growers than the independent field price.
- The co-op has fulfilled its purpose for being organized—to provide goods and services to its members at competitive prices and return its profits back to its members.
- In ten years the co-op has repaid all original capital loans. Has good volume, quality members, good equipment and personnel, short revolving cycle, etc.

Among the comments of those less sanguine about their cooperative's success included the following:

- We are getting by. Co-ops are complex like the people they comprise.
- I believe we will find two major problems: (1) trucking has cost us too much because

production was down due to the weather, and (2) it is too much for a farmer to handle management.

- Possible new members are in a wait and see attitude, and the five year commitment they must make to sell all their cattle through the co-op is hard to do.

B. A statistical model of the determinants of success.

1. Constructing a measure of success.

No business's success is guaranteed. Bad luck, unexpected adverse economic conditions, new competition, changing consumer preferences, etc. can topple even the most carefully planned, best run enterprise. However, the main purpose of this report has been to suggest that there are particular economic conditions and certain organizational, financial, and operational features that will enhance a cooperative's chances for success, all else considered.

We could, in fact, formalize these ideas in terms of an equation with the probability of success, a variable ranging from zero to one, being explained by the economic, organizational, financial, and operational factors. undertake this task, a first point to note is that we do not actually observe the underlying probabilities of success or failure in an enterprise, but, rather, we observe the outcome: a successful business or one that is not successful.

The goal of this section is, therefore, to take the information on success or lack thereof as provided by the respondents in our sample of new cooperatives and statistically relate the successful/not-successful variable to the other economic, organizational, financial, and operational information provided in the surveys. In this manner, we hope to obtain equations that indicate the importance of the various factors in determining success and can be used for predicting the probability of success for a cooperative with a particular set of characteristics.

The statistical technique used to accomplish this task is called *logit analysis*.⁴¹ The first task is to construct a measure of success. Although respondents were given four success/failure categories, these must be condensed into two for present purposes. The choice made was to employ the following dichotomy: major success and not a major success. Cooperatives rated as a major success by the respondent were placed in the major success (MS) category and assigned for statistical purposes the value 1.0. All

⁴¹For those who have some familiarity with statistical methods, logit analysis is a modification of the basic linear regression model to accommodate qualitative dependent variables such as buy-no buy decisions, yes-no responses, or, as in our situation, the dichotomy between success and lack of success. The technique is discussed in most modern econometrics textbooks.

other responses, minor success, too early to tell, and not successful, were lumped into the category "not a major success," (NMS) and assigned the value of 0.0.

At the outset we should note that there is some arbitrariness to this categorization. In particular, each cooperative's category is based on the opinion of the respondent. Others might view the matter differently. In addition, placing too-early-to-tell cooperatives in the NMS may miscategorize cooperatives ultimately destined for success.

Two factors mitigate the first problem. Multiple survey responses from the same cooperative always resulted in the same success rating, and statistical analysis of the ratings indicated no persistent bias in the response due to the position of the respondent. In particular, manager/employee respondents were not significantly more likely to rate a venture as a major success than were member/director respondents.

As to concern over miscategorizing too-early-to-tell cooperatives, evidence from the surveys tended to suggest with only a few possible exceptions that this was, in fact, an equivocal response. In other words, people choosing the too-early-to-tell category could not judge the cooperative to be a major success but believed there was still a chance to "turn the corner" to success. As such, most of the too-early-to-tell cooperatives would be appropriately placed in the not-a-major-success category.

2. Variable selection.

The number of possible determinants of success included in the survey forms exceeds the number that would be prudent to include, given our number of sample cooperatives, in a single equation. Our solution to this problem was to adopt a two-stage approach to the estimation. In stage I we classified our determinants of success according to whether they were economic, organizational, financial, or operations/management variables. Separate equations were estimated to relate the MS or NMS success variable to each group of determinants. The most significant determinants from the Stage I equations were used to produce a "best" model in Stage II.

Thus, we have four Stage I models. Model I relates the probability of MS to several of the economic factors discussed in Part 1 and summarized in Table 7. For statistical purposes, the three response categories, A, B, and C, needed to be condensed into two: thus for the following factors we created an indicator variable which is set equal to 1.0 for respondents who listed A, an important factor and is set equal to 0.0 for all other responses:

Q7a — *Price too low (high),*

Q7b — *Existing services ineffective,*

Q7c — *Variable and uncertain prices, and*

Q7d — *Undependable/nonexistent market outlet.*

One other economic variable included in Model 1 was an indicator variable to discern if the type of cooperative in our sample affected the probability of success. We set the variable, *main products marketed* equal to 1.0 if the cooperative marketed fruits, vegetables, or nuts and equal to 0.0 for all other cooperatives, e.g., supply and service co-ops or other marketing co-ops.

Model 2 includes several of the membership factors discussed in Part 2, Section IA. The specific variables are the *growth coefficient*, which measures growth in membership from the initial planning stage to start up; *open membership*, an indicator variable set to 1.0 for co-ops with an open membership policy, set to 0.0 otherwise; *nonmember business*, an indicator variable set to 1.0 if the co-op accepted non-member business, set to 0.0 otherwise; and the *number of members involved at the initial planning stage*.

Model 3 examines the role of initial financing factors on the probability of major success. All variables in model 3 were indicator variables and included: *commercial bank loan*, set to 1.0 for co-ops with a commercial bank loan, set to 0.0 otherwise; *Bank for Cooperatives loan*, set to 1.0 for cooperatives with a loan from a BC, set to 0.0 otherwise; *have equity redemption plan*, set to 1.0 for co-ops with an equity redemption plan, set to 0.0 otherwise; and *obtained funding from grant(s)*, set to 1.0 for cooperatives that obtained one or more grants, set to 0.0 otherwise.

Model 4 covers the role of operations factors including management in affecting the MS or NMS outcome. All variables in model 4 were indicator variables and included the following: *feasibility study*, set to 1.0 for co-ops that reported conducting a feasibility study, set to 0.0 otherwise; *full-time professional management*, set to 1.0 for cooperatives with *full-time professional management*, set to 0.0 otherwise; *manager respondent*, set to 1.0 if the respondent was part of professional management, set to 0.0 otherwise; *private consultant(s)*, set to 1.0 for co-ops that engaged a private consultant, set to 0.0 otherwise; and *public consultant(s)*, set to 1.0 for co-ops that used one or more public consultants, set to 0.0 otherwise.

3. Results.

Results from estimating the four Stage I models are reported in Table 10. To interpret the results note that the estimated coefficient measures each factor's effect on the probability of a major success based on the data. Therefore, factors with a positive coefficient

Table 10. Stage I Logit Analysis of Success Probability

Model/Variable	estimated coefficient	absolute t-statistic
1. Economic factors		
Price too low (high)	0.036	0.065
Existing services ineffective	-0.339	0.642
Variable and uncertain prices	0.173	0.304
Undependable/nonexistent outlet	-0.377	0.687
Main products marketed	-0.306	0.564
Constant	0.312	0.474
Likelihood ratio test		1.275
2. Membership factors		
Growth coefficient	-1.015	1.633
Open membership	1.025	1.466
Nonmember business	1.286	1.826*
Number of members at initial planning stage	0.053	2.446*
Constant	-2.110	2.149*
Likelihood ratio test		12.445*
3. Financing factors		
Commercial bank loans	-0.333	0.498
Bank for Cooperatives loan	0.239	0.372
Have equity redemption plan	1.271	2.049*
Obtained funding from grant(s)	0.338	0.501
Constant	-1.058	2.009*
Likelihood ratio test		6.596
4. Operations/management factors		
Feasibility study	-1.332	1.993*
Full-time professional management	2.404	3.183*
Manager respondent	0.159	0.235
Private consultant(s)	-0.469	0.752
Public consultant(s)	0.210	0.282
Constant	-0.990	1.231
Likelihood ratio test		17.762*

*Indicates statistical significance at the 90 percent level.

are associated with an increasing probability of a MS, while factors with a negative coefficient are associated with a decreasing probability of a MS.

However, the coefficients reported in Table 10 are only estimates that may well deviate from the "true" value. The "absolute t-statistic" column in the table provides information on the amount of confidence to be placed in any estimated coefficient. In general, little confidence can be placed on estimated coefficients that have a small (close to zero) t-statistic. Confidence in the estimate increases for larger t-statistics. One rule of thumb is that for t-values

greater than 1.65, we can safely assume the true effect is not zero with 90 percent confidence. All t-statistics that meet this cut off are noted with an asterisk in the table.

Another feature of Table 10 to note is the likelihood ratio test statistic reported for each model. This statistic measures the statistical significance of the overall model, not any one particular variable in the model. Once again, the larger the value of the statistic the more confident we can be that there is some significant power in the model to explain the MS, NMS dichotomy. Values of the statistic that meet the

90 percent confidence level cut off are noted with an asterisk.⁴²

Turning to the individual models, Model 1, economic factors, performed the poorest. None of the estimated coefficients met the 90 percent confidence level cut off nor did the overall model as measured by the likelihood ratio test. These results do *not* mean that the economic factors cited in Part I are not crucial to success. Rather, the results probably indicate that the economic conditions are all of nearly equal importance and are thus unable to help explain the dichotomy between MS and NMS.

Model 2, membership factors, did do a good job of explaining success. The overall model meets the test of statistical significance as do most of the individual coefficients. All have the signs we would expect based on the analysis in Part 2, Section IA. Open membership and using nonmember business are both positively associated with MS. This result probably reflects the overriding importance for new cooperatives of generating as large a business volume as possible to exploit the available economies of size in production and marketing.

Model 2 also indicates that the greater the number of members involved in the initial planning stages, the more likely is success. More involvement means that the organizing costs are spread across a greater number of people, so no one bears too large a burden. The sign on the growth coefficient (GC) reflects the importance of expanding the membership beyond the initial coalition prior to start up—smaller values for GC are associated with larger rates of membership growth. Thus, the negative sign on GC means that the greater the growth rate, the more likely is success.

Model 3, financing factors, overall did not quite meet the 90 percent significance level cut off but contains some illuminating results, nonetheless. Debt financing from a commercial bank was negatively associated with the success probability while Bank for Cooperatives funding was positively associated with success. Although neither coefficient meets the 90 percent significance test, the results do provide some evidence to support the importance to new co-ops of exploring the advantages of BC funding. It should be noted, however, that the positive correlation between BC funding and success may result from the BCs willingness to loan to only the potentially most successful cooperatives.

Also positively correlated with success, though not statistically significantly, was the variable indicating receipt of one or more external grants. Finally,

presence of an equity redemption plan was positively and significantly correlated with success. This result probably reflects both the good member relations aspects of having a visible plan in place and the fact that the stronger cooperatives were most likely to have a plan.

Model 4, operations/management factors, was also a quite successful model, easily meeting the 90 percent cut off for overall statistical significance. The key variable in the model is the one indicating presence of full-time professional management. It is positively correlated with success and is highly significant.

Also interesting to note is that use of public consultants was positively correlated with success while use of private consultants was negatively correlated with success. Although neither coefficient met the statistical significance test, they do provide some evidence on the efficacy of taking advantage of the publicly available expertise.

We note that manager respondents were somewhat more likely to judge a new co-op to be a MS than were member/directors. However, both the coefficient and its t-value are very small, prompting our earlier conclusion that position of the respondent did not significantly bias the surveys.

Finally, the negative sign on the variable indicating that a feasibility study was conducted is an anomaly. Clearly conducting a feasibility study should not diminish success prospects. It may be that feasibility studies were commissioned only in those cases where success prospects were most dubious, thus ultimately leading to the negative correlation between MS and a feasibility study.

Table 11 contains the estimation results for the Stage II "best" explanatory model of the MS, NMS dichotomy. Factors chosen from the Stage I models were the following membership factors: growth coefficient, number of members at the initial planning stage, and use of nonmember business. Also included were the variables indicating presence of an equity redemption plan and full-time professional management. The respondent's position variable was also included to control for any biases caused by that factor.

As Table 11 indicates, the Stage II model performs quite well, easily meeting the standard for overall significance. All individual factors have the expected signs with the variables indicating presence of an equity redemption plan and full-time professional management meeting the statistical significance cut off and the variable indicating the

⁴²The likelihood ratio statistic is distributed according to the chi squared distribution with degrees of freedom equal to the number of estimated parameters.

Table 11. Stage II Logit Analysis of Success Probability

Variable	Estimated coefficient	Absolute t-statistic
Growth coefficient	-0.573	0.884
Number of members at initial planning stage	0.035	1.561
Nonmember business accepted	0.756	0.991
Have equity redemption plan	1.163	1.695*
Have full-time professional management	1.256	1.773*
Respondent's position in co-op	0.259	0.389
Constant	-2.580	2.665
Likelihood ratio test		19.197*

*Indicates statistical significance at the 90 percent level.

number of members at the initial planning stage only narrowly missing the cut off. The "R2" statistic indicates that this model explains about 30 percent of the variation between MS and NMS found in our sample, a good performance by logit model standards.

V. Summary.

This part of the report has been devoted to describing our survey of recently-formed American agricultural cooperatives and to analyzing the survey responses that were generated. We found, not surprisingly, a mixed bag of success (about half of our sixty plus respondents reported that their co-op was a major success) and other, less serendipitous results. Respondents generally agreed that the economic conditions amenable to co-op formation discussed in Part I were, in fact, important factors motivating the decision to develop a cooperative.

Most of our sample cooperatives had open membership and accepted nonmember business. These characteristics we found to be positively correlated with the success probability based on the statistical analysis reported in Section IV. A relatively few people were found to be involved in the initial organizing stages of the cooperatives, but the more that

were involved, the more likely was the co-op to be successful. Similarly the statistical analysis demonstrated that membership growth from the initial planning stages to the time of start up was also important to success.

On the topic of financing about two-thirds of the sample cooperatives generated initial equity capital from membership fees, and 43 percent issued stock. Only about one-fourth obtained start-up capital from grants.

About one-third of the sample cooperatives obtained loans from a Bank for Cooperatives, and one-fourth borrowed from commercial banks. The BC borrowers tended to be the more successful of the two.

In the area of decision making and management, the new cooperatives made extensive use of both public- and private-sector consultants, with co-ops using public sector assistance tending to be more successful. Voting with two exceptions was based on the one person, one vote principle. Finally, a key success-determining factor was found to be the presence of full-time professional management which 59 percent of the sample cooperatives indicated having.

CONCLUSIONS AND RECOMMENDATIONS

Cooperatives have been an important part of America's agricultural economy, and they no doubt will continue to play a major role as agriculture prepares to face the demands and challenges of the twenty first century. However, to retain their vitality cooperatives must be flexible and in step with the modern, evolving economy.

In focusing on the role that cooperatives can play in the modern economy this report has confirmed some traditional maxims for cooperatives' behavior but has also presented some ideas at odds with traditional wisdom. We state our main conclusions and recommendations in ten steps to success to be followed more or less in sequence.

- Step 1: Analyze market conditions with a keen understanding of what cooperatives can and cannot do. Do not waste time and money on organizing a cooperative when markets already perform reasonably well.
- Step 2: If a determination is made based on the criteria described in Part 1 of this report that a cooperative can potentially generate net benefits to farmers, conduct a feasibility study questioning whether sufficient membership, business volume, and equity capital can be obtained to realize these benefits.
- Step 3: If Step 2 generates an affirmative response, organize the cooperative so as to maximize the membership size and to build commitment among members. Be flexible as to financial commitments and voting procedures to achieve the first objective. Use long-term member contracts with stiff penalties for violations to achieve the latter.
- Step 4: Carefully estimate the new cooperative's business volume and plan capital facilities that will efficiently handle that volume.
- Step 5: If possible, hire a full-time professional manager to run the operation.

- Step 6: Finance initial capital outlays, and generate a sufficient equity base by using flexible membership fees and possibly grants. Obtain debt capital through the Banks for Cooperatives or Industrial Development Bonds.
- Step 7: Develop a plan to refund retained equities back to members.
- Step 8: Establish pricing policies that exploit cooperatives' built-in flexibility in pricing. If possible, approximate the optimal prices to members using the procedures set forth in Part 2, Section IIIA.
- Step 9: Carefully consider membership policies. There are prospective advantages and disadvantages to open versus closed membership and to accepting or refusing to accept nonmember business. These considerations are discussed in Part 2, Section IA. Determine which considerations are dominant for each particular situation.
- Step 10: Always remember the relative strengths and weaknesses of cooperatives as a business organization. The strengths include harmonization of trade, ease of communication, pricing flexibility, and government policies that are beneficial to cooperatives. The main weaknesses of cooperatives are their difficulty in obtaining equity capital and their failure to reward entrepreneurial activity. Cooperatives may also be less flexible than other business organizations owing to their democratic nature. Exploit the strengths and take steps to overcome the weaknesses. Our hope is that this report helps provide the means to do so.

Survey Form Sent to Active Marketing Cooperatives

e. individual farmers lacked bargaining power A B C

- 1a. Name of cooperative _____
- 1b. Address of cooperative _____
- 2a. Name and telephone number of respondent _____
- 2b. Respondent's position (past and/or present) in the cooperative _____

- 3. In what year did active planning for the cooperative begin? _____
- 4. How many producers were involved in the initial planning stage? _____
- 5. In what year did the cooperative begin actual operation? _____
- 6a. How many members were there at the time of initial operation? _____
- 6b. If (6a) differs from (4), how were additional members recruited? _____

7. We are interested in the factors that led to forming the cooperative. We have listed several possible deficiencies in the prevailing (precooperative) marketing arrangements. For each, please indicate if it was A. an important factor, B. a minor factor, or C. not a factor in the decision to form a cooperative. For important and minor factors, please explain the circumstances, if possible.

- a. prices were too low A B C _____
- b. marketing services were not performed effectively A B C _____
- c. prices were subject to too much variability or uncertainty A B C _____
- d. marketing outlet did not exist or was undependable A B C _____

- f. other (please list) A B _____
- g. other (please list) A B _____

- 8. Were other organizational forms considered?
 - a. partnership [yes no]
 - b. subchapter S corporation [yes no]
 - c. ordinary corporation [yes no]
 - d. other (please specify) _____
- 9. If alternative organizations were considered, why was the co-op form chosen? Some possible reasons are listed below. Please indicate for each if it was A. an important factor, B. a minor factor, or C. not a factor.
 - a. tax considerations A B C
 - b. access to debt financing, e.g., bank for cooperatives A B C
 - c. size of membership precluded use of other forms A B C
 - d. other (please specify) _____
- 10. Several sources are available to provide information or consulting to farmers considering forming cooperatives. For each source listed below please indicate if it was A. an important source, B. a minor source, or C. not a source of information or consulting.
 - a. university extension specialist A B C
 - b. USDA (Agricultural Co-op Service) A B C
 - c. farm advisors/county extension agent A B C
 - d. bank for cooperatives A B C
 - e. private consultants, e.g., lawyers, accountants A B C
 - f. other (please specify) _____
- 11. Were any financial feasibility studies conducted? [Yes No] If yes, please explain the nature of the study and by whom it was conducted.

12. How was start-up equity capital obtained?

a. none
b. members (Yes No)
1. fees
2. assessments
3. stock
c. other (Yes No) If yes, please explain

13. How was start-up debt capital obtained?

a. commercial bank (Yes No)
b. bank for cooperatives (Yes No)
c. other (please specify)

14. Were grants an important initial source of funds? (Yes No) If so, please list the grant sources

15. How many members does the co-op currently have?

16a. Is the membership open now? (Yes No)
16b. Was membership open in the past? (Yes No) If yes, during what time period?

17a. (To be answered only if the membership is currently open.) Some possible advantages of maintaining open membership are listed below. Please indicate for each if it is A. an important factor, B. a minor factor, or C. not a factor in the decision to maintain open membership. Please briefly explain your answer, if possible.

a. more members and a larger operation make the co-op run more efficiently, i.e., at lower per unit costs A B C

b. more members and greater volume give the co-op more bargaining power A B C

c. open membership is the co-op way of doing business A B C

17b. (To be answered only if the membership is currently closed.) Some possible advantages of maintaining a closed membership are listed below. Please indicate for each if it is A. an important factor, B. a minor factor, or C. not a factor in the decision to close the membership. Please briefly explain your answer if possible.

a. physical plant and marketing facilities are currently maintained at efficient capacity--more production would introduce inefficiencies A B C

b. the volume of product placed on the market is restricted by closing the membership A B C

c. other (please list and explain) A B

18. Is nonmember business accepted? (Yes No)
Why or why not?

19. (To be answered only if nonmember business is accepted.) Does the cooperative retain and pay taxes on earnings from nonmembers? (Yes No)

20. Listed below are commonly used methods for cooperatives to acquire additional capital. For each source, please indicate the percentage of total equity capital that currently comes from each source.

a. annual or other periodic membership fees _____ %
b. required stock purchases for existing members _____
c. initial fees from new members _____
d. initial stock purchases by new members _____
e. per unit retains _____
f. retained patronage funds _____
g. other (please list) _____
h. other (please list) _____ 100%

28. About how many other companies compete in these same markets? _____
 How many, if any, of the competing companies are cooperatives? _____

29. Please briefly describe the nature of competition in these markets? For example, are relations between cooperatives different than relations between cooperatives and non-cooperatives? _____

30. At the present time, would you rate the co-op venture a success? _____
 [major success minor success not successful too early to tell]
 Please explain your answer. _____

21a. Is a plan in place to revolve equity back to members? [Yes No] If yes, please explain briefly how it works. If no plan exists are there plans to develop one? _____

21b. Do members earn interest on their equity contributions? [Yes No] If yes, at what rate? _____

22. How is voting conducted? (please check appropriate selection)
 a. one person one vote _____
 b. in proportion to patronage _____
 c. other (please explain) _____

23. How is the cooperative managed? (please check appropriate selection)
 a. producer managed _____
 b. professional management--full time _____
 c. professional management--part time _____
 d. other (please explain) _____

24. What are the main products marketed? _____

25. Does the co-op assume ownership (take title) of the products marketed, or does it act only as a selling agent? [ownership selling agent]

26. Several types of buyers are listed below. For each type, please indicate if it is typically A, an important direct source of sales, B, a minor direct source of sales, or C, not a direct source of sales.
 a. processors A B C
 b. wholesalers A B C
 c. institutions (e.g., hospitals) A B C
 d. retail stores A B C
 e. restaurants A B C
 f. consumers A B C
 g. other A B

27. In addition to selling, does the co-op A, generally perform, B, occasionally perform, or C, not perform the following marketing services.
 a. Pick up (assembly) of product from farms A B C
 b. Grading/sorting A B C
 c. Processing A B C
 d. other (please list) _____ A B
 _____ A B

Survey Form Sent to Active Purchasing Cooperatives

- 1a. Name of cooperative _____
- 1b. Address of cooperative _____
- 2a. Name and telephone number of respondent _____
- 2b. Respondent's position (past and/or present) in the cooperative _____
3. In what year did active planning for the cooperative begin? _____
4. How many producers were involved in the initial planning stage? _____
5. In what year did the cooperative begin actual operation? _____
- 6a. How many members were there at the time of initial operation? _____
- 6b. If (6a) differs from (4), how were additional members recruited? _____
7. We are interested in the factors that led to forming the cooperative. We have listed several possible deficiencies in the prevailing (precooperative) supply or service arrangements. For each, please indicate if it was A. an important factor, B. a minor factor, or C. not a factor in the decision to form a cooperative. For important and minor factors, please explain the circumstances, if possible.
- a. Prices were too high A B C _____
- b. Supplies and/or services were not of desired quality A B C _____
- c. Prices were subject to too much variability or uncertainty A B C _____
- d. Needed supplies and/or services were unavailable or their supply was uncertain A B C _____

e. other (please list) A B _____

f. other (please list) A B _____

8. Were other organizational forms considered?

- a. Partnership [yes no] _____
- b. Subchapter S corporation [yes no] _____
- c. Ordinary corporation [yes no] _____
- d. Other (please specify) _____

9. If alternative organizations were considered, why was the co-op form chosen? Some possible reasons are listed below. Please indicate for each if it was A. an important factor, B. a minor factor, or C. not a factor.

- a. Tax considerations A B C _____
- b. Access to debt financing, e.g., bank for cooperatives A B C _____
- c. Size of membership precluded use of other forms A B C _____
- d. Other (please specify) _____

10. Several sources are available to provide information or consulting to farmers considering forming cooperatives. For each source listed below please indicate if it was A. an important source, B. a minor source, or C. not a source of information or consulting.

- a. University extension specialist A B C _____
- b. USDA (Agricultural Co-op Service) A B C _____
- c. Farm advisors/county extension agents A B C _____
- d. Bank for cooperatives A B C _____
- e. Private consultants, e.g., lawyers, accountants A B C _____
- f. Other (please specify) _____

11. Were any financial feasibility studies conducted? [Yes No] If yes, please explain the nature of the study and by whom it was conducted.

12. How was start-up equity capital obtained?

- a. None _____
- b. Members [Yes No] _____
1. fees _____
2. assessments _____
3. stock _____
- c. Other [Yes No] If yes, please explain _____

13. How was start-up debt capital obtained?

- a. commercial bank [Yes No]
- b. bank for cooperatives [Yes No]
- c. other (please specify) _____

14. Were grants an important initial source of funds? [Yes No] If so, please list the grant sources _____

15. How many members does the co-op currently have? _____

16a. Is the membership open now? [Yes No] _____

16b. Was membership open in the past? [Yes No] If yes, during what time period? _____

17a. (To be answered only if the membership is currently open.) Some possible advantages of maintaining open membership are listed below. Please indicate for each if it is A. an important factor, B. a minor factor, or C. not a factor in the decision to maintain open membership. Please briefly explain your answer, if possible.

a. more members and a larger operation make the co-op run more efficiently, i.e., at lower per unit costs A B C _____

b. more members and greater volume give the co-op more bargaining power A B C _____

c. open membership is the co-op way of doing business A B C _____

d. other (please list) A B _____

17b. (To be answered only if the membership is currently closed.) Some possible advantages of maintaining a closed membership are listed below. Please indicate for each if it is A. an important factor, B. a minor factor, or C. not a factor in the decision to close the membership. Please briefly explain your answer if possible.

a. physical plant facilities are currently maintained at efficient capacity—more production providing a larger volume of supplies and/or services would introduce inefficiencies A B C _____

b. other (please list and explain) A B _____

18. Is nonmember business accepted? [Yes No] Why or why not? _____

19. (To be answered only if nonmember business is accepted.) Does the cooperative retain and pay taxes on earnings from nonmembers? [Yes No] _____

20. Listed below are commonly used methods for cooperatives to acquire additional capital. For each source, please indicate the percentage contribution to capital that currently comes from each source.

- a. annual or other periodic membership fees _____ 2
- b. required stock purchases for existing members _____
- c. initial fees from new members _____
- d. initial stock purchases by new members _____
- e. per unit retained _____
- f. retained patronage funds _____
- g. other (please list) _____
- h. other (please list) _____ 100%

21a. Is a plan in place to revolve equity back to members? [Yes No] If yes, please explain briefly how it works. If no plan exists are there plans to develop one? _____

21b. Do members earn interest on their equity contributions? [Yes No] If yes, at what rate? _____

22. How is voting conducted? (please check appropriate selection)
- a. one person one vote _____
 - b. in proportion to patronage _____
 - c. other (please explain) _____
23. How is the cooperative managed? (please check appropriate selection)
- a. producer managed _____
 - b. professional management--full time _____
 - c. professional management--part time _____
 - d. other (please explain) _____
24. What are the main products and services supplied? _____

25. About how many other companies compete in these same markets? _____
26. How many, if any, of the companies are cooperatives? _____
27. Please briefly describe the nature of competition in these markets? For example, are relations between cooperatives different than relations between cooperatives and non-cooperatives? _____

28. At the present time, would you rate the co-op venture a success?
 [major success minor success not successful too early to tell]
 Please explain your answer.

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