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A financial analysis of grain marketing and production supply cooperatives, 1985-1991

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by

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CHAPTER I. INTRODUCTION

A. Background

Agricultural cooperatives are substantial contributors in the marketing of agricultural products and farm input supplies and services. In 1990, cooperatives' combined market share of agriproducts marketed was twenty-seven percent. Cooperatives also claimed a twenty-seven percent share of the market for agricultural production supplies in the same year. The product's market share was down approximately six percent from 1981 due in part to the failure of a few large regional cooperatives, e.g. Union Equity and Pacific Grain Growers. At the local level though, cooperatives generally realized gains in market share, especially in the production supplies business, up seven percent since 1981 (Kraenzle, 1992).

Over this decade, the number of operating farmer-owned cooperatives and their memberships decreased dramatically. In 1981, there were 6,211 cooperatives operating throughout the United States boasting memberships of 5.34 million. At the end of 1990 these numbers had dropped to 4,663 operating cooperatives with 4.12 million memberships (Kraenzle, 1992). Two contributing events in these declines were: 1) The combined effects of substantial decreases in the number of active farmers and increases in the size of farm operations forced many local cooperatives into merger or consolidations;

and, 2) the financial difficulties experienced in the agricultural industry during the 1980's led to an increase in acquisitions and liquidations of cooperatives. A result of this restructuring was that by 1990, a representative local marketing and supply cooperative's business volume and scope of operations had increased considerably.

Reinforced by the organizational restructuring of the 1980's the renewed interest in cooperative structure, theory and practices that began during the 1970's continues to attract the attention of industry leaders, researchers, theoreticians and policy makers. Much of the industry's interest naturally focuses on the issues that affect a cooperative's profitability and long-term viability. Academic attention has focused on the development and application of cooperative theory and its industrial organization implications, the research methodology used in measuring cooperative performance and public policy concerns of producers and consumers in the agribusiness arena. One of the objective of this thesis is measuring cooperative performance.

The literature contains numerous studies comparing the performance and behavior of farmer-owned cooperatives to the performance and behavior of investor-oriented firms (IOFs). Past legislative mandates granted to cooperatives resulted in fundamentally different organization structures between them and IOFs. The enactment of the Capper-Volsted Act granted

farmer-owned cooperatives limited exemptions from anti-trust legislation. And subsequent Tax Acts provided favorable tax treatment to corporations operating on a cooperative basis, i.e distributing net earnings based on patronage rather than capital contribution. Agricultural cooperatives have therefore occupied a unique position in the American economy as a producer vehicle for vertical integration.

This unique position of farmer-owned cooperatives in the economy has led some theorists, investigating the organizational differences between agricultural cooperatives and IOFs, to hypothesize a particular objective function for cooperatives and then show how attempts to maximize that function lead to behavior different from that of IOFs (LeVay, VanSickle and Ladd et al.). Other researchers have taken a more structuralist approach to identify how cooperatives and IOFs differ. This view argues that the unique structural characteristics of cooperatives may lead them to behave differently from IOFs (Staatz, 1987).

With the growth in the size and scope of operations of cooperatives in the past decades, especially at the regional level, some authors have argued that the behavior of many farmer cooperatives has become indistinguishable from that of IOFs (Kravitz, 1974). This alleged blurring of function and purpose between these two organizational forms may have serious public policy implications regarding the specialized

tax treatment granted to cooperatives. The unique owner-patron relationship that grants cooperatives differential tax liability has recently been challenged more seriously by tax-reform proponents.

This challenge is forcing a major reexamination of income distribution methods, capital financing plans and the profitability goals of cooperative forms of business enterprise. In addition to measuring cooperative performance, this thesis also examines the capital structure relationship between firm profitability and organizational growth.

The remainder of this chapter reviews different capital financing characteristics and practices of both IOFs and agricultural cooperatives. Special attention is devoted to (1) methods of cooperative capital financing, (2) issues and concerns of equity building, and (3) the Board of Directors role as they establish and implement capital financing strategies. The chapter concludes with a problem statement defining a Board of Director's capital financing objectives and an outline of the research objectives of this thesis.

B. Capital Financing in Investor-Oriented Firms

The purpose of this section is to review and highlight the chief capital financing characteristics and practices of investor-oriented firms. It is not intended to be an exhaustive summary of financing issues faced by IOFs nor an

attempt to analyze their optimal capital structure. Rather it is aimed at providing the background necessary to compare and contrast the structural differences in capital financing between IOFs and locally owned farmer cooperatives.

Investor-oriented firms have numerous sources of funds available to them when considering the capital requirements of financing new or existing investments. These sources may fulfill either the equity capital or debt capital needs of the firm. The instrumental sources of finance capital for an IOF includes the following: 1) A firm may offer new issues of common or preferred stock; 2) It may utilize internally generated funds in the form of retained earnings; 3) It may acquire more debt in the form of bond issues; and 4) The firm may borrow funds from lenders, i.e. bank notes, mortgages, commercial paper, etc.

Stock issues and retained earnings provide the equity base for an IOF. Retained earnings function as additional capital investments by the shareholders since share values are recapitalized in the secondary market, in part, based on a firm's ability to generate internal financing. The shareholders of an IOF's common stock are the owners of the corporation although their control of the firm is generally limited to the right to vote, either in person or by proxy, on Board of Director appointments or the issue of additional shares of common stock (Brealey and Myers, 1988). The voting

rule is one vote per share owned so that an investor's control is proportionately based on the number of shares of stock, or equity, they hold of the firm.

Common stock represents the permanent equity capital of an IOF. Owning common stock entitles the stockholder perpetual residual claims on the firms earnings. A stockholder's return on their investment has two sources: 1) dividends paid proportionately to the number of shares owned; and 2) any appreciation or depreciation in the value of the stock, including stock splits. The source of dividends paid to stockholders are the after-tax earnings of the firm. The value or price of common stock is continuously capitalized in the secondary market based on the market's expectations of a firm's future income streams. In addition to capitalizing stock values, the secondary market provides stockholders a source of liquidity on their investment.

Retaining earnings is the simplest and most commonly practiced form of equity capital financing employed by IOFs. Because a firm may choose to reserve a percentage of its earnings rather than paying them out as dividends, retained earnings serve as additional equity investments by the stockholders. The equity base may also be expanded and finance capital acquired from offering new issues of common stock, although this practice is seldom used.

Retained earnings and dividends payments are derived from

a firm's after-tax profits. Dividends are subject to double taxation: as part of the earnings at the corporate level and then as dividend income at the individual level. IOFs, therefore, must examine any tax advantages or disadvantages when considering these two forms of capital financing.

An essential source of capital financing available to an IOF is the corporate bond market. The bond market provides a firm a place to sell its corporate bonds to raise debt capital. Corporate bonds (funded) represent long-term loans that investors provide to an IOF in return for regular interest payments until the bond matures or is called and its principle repaid. An IOF's liability is limited with respect to these debt issues in that stockholders have the right to default on any debt obligation, handing over the corporation's assets to the lenders with no further recourse against stockholders (Brealey and Myers, 1988).

Mortgages, bank loans and commercial paper offer IOFs additional sources of debt-capital financing. The time horizon of these debt instruments varies. Mortgages are generally viewed as long-term debt while bank loans are considered intermediate debt and commercial paper is regarded as short-term debt. The choice and use of these sources of debt capital varies with the size of the firm, its immediate needs, and its long-term plans. The capital requirements of financing inventories or expanding a physical plant demand

appropriate use of debt instruments for such activities. IOFs must carefully weigh the capital costs of financing its ongoing needs and planned operations.

Unlike dividends paid out of earnings or any retained earnings, the interest IOFs pay on bonds and loans is from the firm's earnings before taxes. Interest payments are expense before a firm's tax liability is calculated. This effectively creates a tax-subsidy when the capital financing of an IOF is acquired through debt.

Issuing preferred stock is another source of capital financing available to an IOF. Preferred stock is legally considered an equity security but unlike common stock, it usually carries no voting rights and any dividends paid are made at the discretion of the Board of Directors. Preferred stock shares the same perpetual nature of common stock although a percentage of the issues make some provision for periodic retirement and in many cases corporations have an option to repurchase or call preferred stock at a specified price. Any dividends paid on preferred stock is from the after-tax earnings of the firm.

Having reviewed the key capital financing alternatives available to IOFs, the next section of this thesis examines capital financing of agricultural cooperatives and how it differs from that of an investor-oriented firm.

C. Capital Financing in Agricultural Cooperatives

Before examining the capital financing practices of agricultural cooperatives and how they differ from those of IOFs, it is useful to review the unique organization structure and characteristics of farmer-owned cooperatives. This brief review provides the necessary foundation for understanding their specialized capital financing practices.

Agricultural cooperatives are generally defined as business organizations that are owned and controlled by their patrons, who share in the economic benefits of the business based on member patronage. Given the diversity of these organizations, no one definition or theory of cooperatives is likely to be comprehensive.

For the purposes of this thesis, a farmer-owned cooperative will be defined as an organization with the following characteristics (Staatz, 1987):

1. The stockholders, who are farmers, are the major users of the firm's services.

2. The benefits a stockholder receives from committing capital to a cooperative are tied largely to patronage. There are three reasons for this:

   (a) The business pays a strictly limited dividend on equity capital invested in the organization.

   (b) Net margins are distributed among stockholders in proportion to their patronage with the business rather than in proportion to their equity ownership in the firm. This method of distributing margins captures the "business-at-cost" principle of cooperative organization.

(c) Stock of cooperative firms does not ordinarily appreciate because there is a very limited or nonexistent secondary market for it. Therefore, capital gains are not a major benefit to stock ownership in cooperatives, in contrast to IOFs.

3. The formal governance of the business by the stockholders is structured "democratically" in the sense that:

(a) Voting power is not proportional to equity investment. The limitation on "voting one's equity" may be in the form of a one-member/one-vote rule, or voting may be proportional to patronage or stock ownership but subject to some limit such as restricting any one member from having more than five-percent of the total votes (It varies by state stature governing cooperative charters).

(b) There are strict limitations on the number of non-stockholders who may serve on the board of directors.

With these operational definitions of farmer-owned cooperatives in mind, the unique features of cooperative capital financing can now be examined.

1. Unique features of agricultural cooperative finance

Two key characteristics that distinguish agricultural cooperatives from IOFs are: 1) methods of distributing net income; and 2) sources for equity acquisition. Each of these characteristics are discussed in the following sections.

Unlike their IOF counterparts, the earnings or net income of farmer-owned cooperatives is distributed to its owner-members based on their patronage level with the cooperative rather than on their investment or ownership of

equity in it. The Board of Directors is granted the broad authority to decide how to distribute net income from the alternative distribution methods available. The alternative methods discussed in the following paragraphs include cash and noncash patronage refunds, qualified and nonqualified patronage refunds, dividends, and unallocated reserves.

Patronage refunds are distributions of net income generated solely from patron business that are returned to patrons in proportion to the value or quantity of their patronage. These allocations may be determined on the basis of a straight percentage of the cooperative's patronage or in the case of a 'pooling' cooperative, may be segregated by product line. They may be distributed in cash, retained by the cooperative as noncash refunds, or both. Additionally, patronage refunds may be in either qualified or nonqualified forms (Cobia, 1989).

An important distinguishing feature of qualified patronage refunds is that they can be excluded from a cooperative's taxable income, under what is known as the "single tax principle". However, the patron must agree to include the entire refund as income when computing his or her own taxes. Cooperatives can make patronage refunds in cash payments, or they can pay part in cash and retain the noncash part in the cooperative to increase the patron's equity investment in the firm. In either event, the distribution is

classified as an allocated patronage refund.

For a patronage refund to be qualified and thus exempted from the cooperative's taxable income, the refund must meet the following exacting criteria specified by the Internal Revenue Code: 1) A minimum of twenty-percent of the refund must be paid to patrons in cash; 2) All of the cooperative's net income must have resulted from patronage-source business, not business done with non-members; 3) A preexisting obligation by the cooperative to pay the patronage refund must be made; and 4) Notification of the refund and cash payment must be made within specified time limits. If any of these four criteria are not met, the refund is classified as nonqualified and the cooperative is then obligated to pay taxes on it (Cobia p. 231, 1989).

Allocating a high percentage of refunds in cash form benefits current patrons and may encourage patronage and increase membership, because they can reduce cash flow problems of members who may be financially strapped. Cash patronage refunds are a positive incentive. However, a contention against high cash refunds is that they may compromise a cooperative's financial strength thus hindering its ability to grow. It is generally agreed that cooperatives should be capitalized in rough proportion to use by each member. High cash refunds tend to delay the accumulation of equity from under-invested members while delaying equity

redemption for over-invested members

The noncash portion of qualified refunds or all of any nonqualified refunds are considered as retained refunds by the cooperative. Retained refunds are allocations of net income made to patrons but temporarily retained by the cooperative as allocated equity. The purpose of retaining refunds, rather than returning them to patrons in cash, is to increase patron equity in the cooperative. Patrons are informed of this action by written notices of allocation. Allocated retains are the major source of equity capital in midwestern grain cooperatives. These accumulated funds are used for expansion or to replace previously contributed equity that is scheduled for redemption.

Nonqualified patronage refunds are allocations of net income that do not fulfill the qualifying criteria set by the IRS and for which the cooperative must temporarily assume the income-tax liability. Members are not required to report these refunds as part of their taxable income until they are redeemed as cash. Under the "single tax principle" the cooperative is entitled to deduct the amount redeemed from its taxable income upon the member's redemption of the refund. Written notices of allocation are required for nonqualified refunds. Although not widely used, cooperatives may utilize this form of refund to minimize the tax liability of its members from issuing qualified cash refunds, at least until

the nonqualified is redeemed as cash.

Dividend payments by cooperatives are treated and distributed quite differently than those paid by IOFs. Unlike the permanent nature of equity capital in an IOF, cooperative equity is rarely considered permanent. It must be redeemed at a future date and does not entitle the owner perpetual claims on the firm's earnings unless the stockholder continues to patronize the cooperative. Then the claim on earnings is proportional to the amount of patronage done and not on the amount of stock owned. Thus equity ownership in an agricultural cooperative represents a temporary investment that entitles its owner to claims on the firm's earnings over the duration of their patronage. And unlike IOFs, cooperative equity capital is rarely exchanged or traded among members or nonmembers. The equity of a cooperative essentially represents a commitment by its owner to support and patronize the business.

Some cooperatives do distribute part of their net income to equity holders based on proportion of equity held rather than on patronage. In this respect, the income distribution mimics the dividend payments of IOFs to their stockholders and is not eligible for single tax treatment. However, by law, cooperatives are limited to the amount of dividends payable on equity capital, to eight percent or less of the equities' face value. And normally they are paid only on membership stock.

Equity dividend payments by cooperatives account for a very small portion of net income distributions. The use of dividends by cooperatives is chiefly limited to only section 521 cooperatives, where the cooperative is allowed to deduct dividend payments from their taxable income.[1] These Section 521 organizations make up a small fraction of the cooperatives operating today in the grain business.

Cooperatives may distribute part of their net income as unallocated equity or reserves. Unallocated reserves are earnings retained by the cooperative but not allocated to member-patrons. These reserves may be from patronage or non-patronage source income. Unallocated reserves are discussed in more detail it the following section.

2. Equity and debt issues in cooperative financing

Agricultural cooperatives face many of the same questions and problems that investor-oriented firms must consider when determining their capital financing structure. How does the capital structure of the firm affect its profitability? Can additional leverage improve the performance of the firm assets without threatening solvency? What combination of debt and equity provides the optimal capital structure mix? All firms must address these as well as other questions when considering

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[1] Under subchapter T of the Internal Revenue Code, only a section 521 cooperative can deduct from taxable income nonpatronage income distributed to patrons on a patronage basis and dividends on capital stock.

their capital financing strategies.

What differentiates IOFs and cooperatives with regards to capital financing is how they acquire and handle equity. The unique user-owner linkage of cooperatives makes it both possible and necessary for a cooperative to secure and handle owner-equity capital with specialized methods. Equity acquisition by cooperatives is the focus of this section. But first, the unique features of cooperative equity are summarized by the following five points (Cobia and Brewer, 1989):

1) Only qualifying persons, generally agricultural producers, can become members and own common stock or obtain membership certificates in a Capper-Vostead agricultural cooperative.

2) Patrons provide equity in anticipation of benefits arising from patronage rather than in expectation of capital appreciation or dividends.

3) Equity is redeemed by the cooperative at book or par value, whichever is less.

4) Cooperatives often raise equity indirectly through the use of retained patronage refunds or per-unit capital retains.

5) A substantial portion of cooperative equity is temporary because cooperatives have an implied obligation to redeem it, although mandatory obligations for redemption do not currently exist.[2]

Because equity investment incentives in cooperatives, as opposed to IOFs, lie in the perceived benefits of its

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[2]. Some states do have provisions that approach mandatory redemption. For example, Iowa law requires that cooperatives settle its estate claims before revolving any equity or issuing more than twenty-percent of its patronage refunds in cash.

owner-members, agricultural cooperatives have limited sources from which they can attract their risk capital. Cooperatives are further limited because potential contributors frequently find it difficult to obtain funds for such investments. There are three types and sources of allocated equity available to cooperatives for building a pool of member equity: 1) direct investments; 2) retained patronage refunds; and 3) per-unit capital retains. Cooperatives may also accumulate risk capital from unallocated equity or reserves, though these sources account for a relatively small percentage of grain marketing cooperative's equity.

Direct investments include cash purchases of common or preferred stock, membership certificates, and other forms of equity. Normally the start-up capital of a cooperative is acquired this way, directly from its founding member-patrons. Existing cooperatives may also use the direct investment method to accumulate equity from its members, although the amounts raised are usually limited and it is often a difficult and unsuccessful method of accumulating capital.

As previously mentioned, retained patronage refunds are portions of net income allocated to members but retained by the cooperative. They represent new investments made in the cooperative by those who are patronizing it. Retaining patronage refunds is a popular practice because once established it is an easy and systematic method of generating

equity funds. This method of equity building is particularly well suited for supply-service and buy-sell marketing cooperatives, where per-unit capital retains do not work well.

Depending on retained patronage refunds as a major source of equity capital may be problematic in that the quantity of retained refunds is dependent on net income. And since net income fluctuates with the fortunes of a cooperative, yearly retains do not necessarily match past year retains thus creating a matching problem between ownership and patronage as equity is revolved.

Per-unit capital retains are patron investments in the cooperative that are based on the value or number of units of the products handled for each patron. These investments are deducted from the proceeds of the product a patron markets through the cooperative. Marketing cooperatives most frequently employ this method of accumulating equity capital. Per-unit capital retains are allocated to patrons in either qualified or nonqualified form. They provide a more stable source of equity accumulation than does retained refunds since they are not affected by the level of net income of the cooperative. However, a drawback of this method of equity building is that cash that would otherwise be available to the farmer is reduced by the amount of the retain.

Equity capital may also be accumulated by building funds that are not allocated to any member, patron, or other

individual account by any form of certificate or book credit. Instead, this equity shows up as member equity on the balance sheet but in an unallocated account. These unallocated equities or reserves have numerous sources but a substantial percentage of them come from non-member business. States often place an upper limit on the amount of non-member business a cooperative may conduct. Also, some states legally obligate their cooperatives to maintain a specified level of unallocated equities while other states permit unlimited unallocated reserves for purposes of covering possible losses.

Creditors may look favorably upon cooperatives with significant levels of unallocated reserves. They view these reserves as securable collateral for loan purposes. However, these unallocated equities may create some problems as a method of capital building. Not allocating net income derived from member business violates the cooperative's principle of business at cost. And it may reduce member's incentives for additional investment while simultaneously increasing incentives to dissolve the cooperative.

3. Board of Directors role in cooperative financing

The make-up and function of the Board of Directors in an agricultural cooperative varies substantially from that of an investor-oriented firm. Whereas an IOF's Board of Directors serve as a trustee of the owner's investments, the Board of a cooperative serves not only as a trustee but also as a

representative for its owner-patrons. Most cooperative's articles of incorporation and bylaws have strict limits on non-stockholders serving as Directors on the Board.

A cooperative's Board plays a much more active role in the decision-making process of the business, especially regarding pricing policy, managerial monitoring, and in the acquisition of equity and debt capital in financing the cooperative's assets. The remainder of this section is devoted to the issues and concerns a cooperative's Board of Directors face when developing capital financing plans.

Some theorist have hypothesized that the structure and role of the Board of Directors in an agricultural cooperative are a function of the unique set of property rights embedded in cooperative enterprise (Condon, 1987). Unlike an IOF where managerial performance is often reflected by the daily movements of the firm's stock price in the secondary market, there is no market that continually monitors and evaluates the performance of a cooperative's management in a similar fashion. The task of monitoring the management performance in a cooperative, especially in locals, rests with the Board of Directors.

The Board of most local cooperatives is made up entirely of elected member-patrons whose primary experience is related to farm management. Often they have little experience in controlling the affairs of a large and more complex business

enterprise. This fact reinforces the need for the Directors to consider and understand the different capital financing trade-offs and options available to their cooperative. At least some Board understanding of this is necessary if the cooperative is to increase its profitability and ensure an adequate capital base for its continued operation.

Maintaining an adequate capital base is essential to any organization's survival. This is especially true for agricultural cooperatives who have somewhat limited sources of equity capital. A chief responsibility of a cooperative's Board of Directors is maintaining its capital base and determining its structure. A cooperative's debt-equity mix is a fundamental aspect of the continued profitability of the firm's assets. The Board of Directors must determine which levels of debt and equity capital can best serve that goal.

However, cooperative capital structure financing does not take place in a vacuum. In addition to determining the debt-equity capital mix that best optimize the cooperative's performance, the Board of Directors must also consider the concerns of its member-patrons. Capital financing decisions by the Board affects the profitability of the cooperative's individual members' enterprise as well as the cooperative itself. The effects on member operations extend beyond any direct financial impact.

The long-term viability of the cooperative is also

important because the members in many local grain and input supply cooperatives depend on the service of a cooperative to support their continued farming operation. A Board of Director's myopia regarding capital financing may not be immediately apparent. Too often it manifests itself later in reduced earnings, a shaky capital base and even insolvency.

The Board of Directors has three fundamental capital structure responsibilities: 1) to ensure the effective use of equity and debt capital; 2) to develop and maintain an adequate equity redemption plan; and 3) to maintain financial viability of the cooperative. The following section of this thesis' introduction formulates these concerns of the Board into a problem statement, followed by a statement of its research objective. This chapter ends with a brief outline of following chapters.

D. Problem Statement and Research Objectives

A cooperative's Board of Directors must ask itself many questions when formulating its capital financing plans. Does the cooperative have sufficient equity for its operations? Does it have too much? Is equity being used to cover up poor operating performance? What levels of debt are proper and feasible for financing asset investments? How can the level of debt capital affect the cooperative's profitability? To what extent does the equity-asset structure affect the growth

of the business? These questions, along with others, form the core of the varied problems a cooperative's Board of Directors face in making capital financing decisions. Developing and implementing strategies and plans that address these questions and their resultant problems are a major function of the Board.

A problem statement regarding a cooperative's capital financing structure may be formulated in three parts:

1. Does the cooperative's current capital structure facilitate or detract from its profitability and growth?

2. What changes, if any, in the cooperative's mix of debt and equity capital are necessary to improve its profitability?

3. Can a targeted capital structure simultaneously increase profitability, promote growth and permit timely equity retirement?

When considering capital financing questions confronting the cooperative, the Board of Directors are explicitly determining optimal financing methods while they are simultaneously attempting to maintain the owner-user principles of cooperative organization and serve farmers needs. These can often be conflicting goals.

Chapter II provides a literature review of business firm performance measures and studies. The chapter also reviews studies on cooperative financing and performance, then concludes with a description of the model used in this study.

The objective of this study was to investigate the

relationships between local grain marketing and input supply cooperative's profitability, capital structure and growth potential. The study measured cooperatives' rates of return on their assets and equity and examines structural differences in the debt/equity mixes of a representative sample of midwestern grain elevators. A model of cooperative profitability was used to classify firms according to their realized rates of return on assets and equity. The model identified firms with superior rates of return on owner's investment and an analysis was performed to determine the financial characteristics that distinguished these cooperatives from their less successful counterparts.

Chapter III follows with a discussion of the empirical procedure used in the study. Included is a description of the data and variables under investigation. In Chapter IV, the results of the study are analyzed. Financial variable and ratio profiles are discussed and profitability group comparisons are made. The summary and conclusions of the study are found in Chapter V.

CHAPTER II. LITERATURE REVIEW AND THEORETICAL MODEL AND METHODOLOGY

A. Firm Level Analysis of Financial Performance

Numerous studies measuring firm financial performance have been conducted for both investor-oriented (corporate) and cooperative organizations. Within the literature has been debate whether the financial strength of farmer-owned cooperatives is comparable with standard measures of performance in similar industries (Royer, 1991). Questions have also arisen about whether the equity-based performance measures of agricultural cooperatives are similar to the measures used in IOFs (Parliament and Lerman, 1993). These studies investigate significant differences in the standard performance measures between the two forms of business organization.

Although researchers have hypothesized operational differences when measuring the financial performance of IOFs and cooperatives, the empirical measures and methods used to assess these firm's financial condition are similar. A discussion of these measures and methods of quantifying firm level financial performance follows.

1. Financial performance measures

Without exception, business managers must periodically have a financial analysis done for their firm to measure and

evaluate the efficiency of its assets use, the profitability of its owner's investment, and the ability to service its debt. Investors and creditors often employ financial analysts to conduct these evaluations. In evaluating a firm's financial condition and performance, analysts frequently use financial ratios to express the relationship between various values or categories in a firm's financial statements.

Numerous financial ratios are available for analysts to assess the financial condition of a firm. However, because many of these ratios are highly correlated within a particular performance category (Chen and Shimerda, 1980) relatively few ratios are needed to measure the crucial aspects of a firm's performance. Ratios are typically classified according to four different economic aspects of the firm's operations (Frey and Behrens, 1981). These four aspects are:

a) Profitability

b) Solvency

c) Liquidity

d) Efficiency

Because the research objective of this study was to investigate the relationship between the profitability and solvency effects on a cooperative's viability and growth, the following discussion is limited to the first two economic aspects in the context of local grain marketing and supply cooperatives.

Profitability: Almost without exception, business firms are intended to be profitable by their owners. Profitability refers to the ability of a firm to generate income in excess of expenses. However, cooperatives are not specifically organized to earn profits in a manner similar to IOFs. Rather, they are required to charge prices equal to costs or refund any surplus of revenues over costs to members in proportion to patronage (Royer, 1992). This is achieved by allocating a cooperative's net operating income to its member-patrons as cash refunds or equity credits.

Two measures of firm profitability used in this study are return on investment (local equity) and return on assets (local assets).

Return on investment is the ratio of a cooperative's net earnings to the equity investment of its owners. The ratio is widely used as a measure of performance for the firms's equity capital. It can be viewed as the dollar amount of profit returned to the firm's owner for each dollar they have invested. This ratio is sensitive to the amount of debt capital the firm uses to finance its assets.

The interest of this study is the performance of investments (local equity) under the direct control of a cooperative's member-patrons. For this reason, the equity investments of a cooperative in non-local enterprises, i.e. regional affiliates, Bank of Cooperatives, and other locals

are excluded from a measure of return on investment. These non-local investments are subsumed under investments in other cooperatives on a local's balance sheet. Local equity, therefore, is the difference between a cooperative's total equity and its investments in other cooperatives.

Return on assets is the ratio of a cooperative's net earnings to the total assets employed by a firm. The ratio is a measure of the performance of a firm's assets without regards to how the assets are funded. The measure captures the rate of return on assets from debt and equity financing. It can be viewed as the dollar amount of profits earned per dollar of assets employed by the business. Because return on total assets incorporates both debt and equity capital in its measure, it does not demonstrate the leverage sensitivity found in return on equity and may be a more reflective measure of profitability.

Again, the interest of this study was the performance of the total assets (local assets) under direct control of a cooperative's member-patrons. A local cooperative's equity investments in 'other cooperatives' are offset on the asset side of its balance sheet with an equivalent entry under other investments. The local assets used to measure a cooperative's rate of return on total assets were derived by subtracting its balance sheet entry for other investments from its total assets. The rate of return measure of assets therefore

captures the return generated by a local's total current and fixed assets.

Solvency: Solvency typically refers to the capital structure of a business. That is, to what degree are debt and equity capital used to finance the firm's assets. Of particular interest is the relationship between the level of debt and equity capital used to finance the firms fixed assets. Solvency ratios give an indication of balance sheet strength and the relative claims the owners and debtors of a firm have on its assets (Ginder and Henningsen, 1993). This study uses a total debt-local assets measure of solvency.

The total debt-local asset ratio is a measure of the amount of debt used to finance a firm's local assets. The ratio can be viewed as the dollar amount of debt the firm carries for each dollar of locally owned assets it employs. Generally, higher measures of this ratio indicate increased levels of financial risk. Highly leveraged firms often experience difficulties in obtaining additional loans during periods of unfavorable economic conditions and may therefore face possible divestiture or even liquidation.

2. Studies of financial performance measures

Financial ratios have proved useful in evaluating the performance and financial condition of business organizations. Studies have shown that financial ratios can separate financially-distressed firms from non-failed firms with a high

degree of accuracy in the year before the declaration of bankruptcy (Altman, 1968 and Beaver, 1967). Another study showed that the use of financial ratios to determine bond ratings resulted in virtually identical ratings with the bond's institutional ratings (Pinches and Mingo, 1973).

These studies demonstrated certain predictive powers associated with specific financial ratios. Yet there are dozens of ratios financial analysts can use to measure the performance and financial condition of a firm. Surprisingly few empirical studies have examined the applicability of specific financial ratios in analyzing firms.

A study by Pinches, Mingo and Caruthers (1973) established an empirically based classification of financial ratios. Their analysis revealed seven classifications of ratios that can be represented by seven factors - Return on Investment, Financial Leverage, Capital Turnover, Short-term Liquidity, Cash Position, Inventory Turnover and Receivables Turnover. Four of these factors parallel the four traditional classifications of ratios identified by Frey and Behrens.

In the aforementioned study, representative ratios of profitability were cash flow to net worth, cash flow to total assets, and cash flow to sales. A ratio representing efficiency was sales to assets, representing a liquidity ratio was current assets to current liabilities, and representing a solvency ratio was debt to assets.

Solvency ratios have been further analyzed by researchers attempting to link debt levels with income. Melichar (1984) illustrated the joint impact of a farmer's debt level and the interest rate to the income rate of return on equity. In identifying financially stressed operations, he classified farm firms by debt-asset ratio categories.

Harrington (1985) divided and labeled these ratio classifications of farm operators into four groups. Farm operators with debt-asset ratios over one hundred percent were described as "technically insolvent". Operators having ratios between seventy and one hundred percent had "extreme financial problems". Those operators having debt-asset ratios between forty and seventy percent had "serious financial problems", and those with ratios below forty percent had "no apparent financial problems".

B. Studies of Performance in Agricultural Cooperatives

The empirical studies reviewed in this section examine methods of measuring agricultural cooperative performance and techniques of comparing their performance with IOFs.

In the late 1970's and early 1980's, many cooperatives were experiencing severe financial stress due to low rates of return and over-leveraging. Haugen (1981) found that cooperatives were increasingly relying on the use of long-debt in place of equity relative to competing agricultural firms

and that cooperative returns were below those of competitors. It was hypothesized that cooperatives had greater leverage ratios than the industry average because, in part, they were "equity bound", i.e. due to the lack of secondary markets for their stock, debt financing dominated internal financing for many firms (Royer, 1991). The fundamental point was that a cooperative's members were its only source of equity capital.

In 1991, Royer conducted a comparative, financial ratio analysis of farmer-owned cooperatives to determine (1) whether significant differences existed in the financial strength of cooperatives compared with industry standards, and (2) to assess whether cooperative's relative financial condition had generally improved since the early 1980's.

The study focused on firm liquidity, measured by the current ratio, and firm solvency, measured by the debt/equity ratio. Because the source of the industry standards presented only median and quartile financial ratios, the analysis was based largely on the use of non-parametric statistical methods.

The results of the analysis provided no evidence to support the hypothesis that cooperatives generally were financially weaker than other firms in the industries in which they operated. Current ratios lower than their industry standard were found in several cooperative groups, although most of these groups consisted of marketing associations.

This finding was largely explained by the unique business relationship between these associations and their members and the extent in which proceeds payable to patrons appeared on year end balance sheets as current liabilities.

Comparative analysis of cooperative debt/equity ratios indicated that, with the exception of regional grain and regional farm supply firms, cooperatives generally were less leveraged that other firms in their industries. This was especially true for local cooperatives handling grain and farm input supplies. A factor contributing to the differences between the regional and locals is that the equity position of local cooperatives handling grain and farm supplies is artificially enhanced by the double counting of the earnings they receive from their regional affiliates but which are retained by the regional as capital investments. At the end of fiscal 1987, nearly twenty-seven percent of local grain and farm supply cooperative's equity was held as inter-cooperative investments.

The single tax treatment granted to businesses operating on a cooperative basis has led to criticism that these firms enjoy an unfair advantage over their IOF counterparts in raising equity capital. The critics argued that retained patronage refund allocations represent a free, untaxed source of equity capital that confers a cost of capital advantage to cooperatives.

IOFs and cooperatives both have incentives in relying on internal financing for raising equity capital, but for different reasons. The double taxation of corporate income discourages ongoing corporations from issuing new shares of common stock. An IOF's incentive for internal financing stems largely from tax considerations. Cooperative incentives to rely on internal finance are partly tax-based but are more dependent on the property structure of the firm, i.e. the practice of member-patrons supporting and financing the firm's operations in proportion to their patronage.

Caves and Petersen (1986) investigated the hypothesized "tax advantage" of cooperatives over IOFs with respect to their respective costs of capital and its effects on cooperative growth rates. The authors first examined taxation and the cost of internal finance among IOFs and cooperatives and then investigated the relationship between internal financing and firm growth.

Citing an approach used in the literature of finance and public finance for determining debt's net tax advantage by way of internal finance, the authors assessed the possible tax advantage of cooperatives. They showed that tax savings can be achieved by the cooperative form of organization if

$$I(1 - T_d) > I(1 - T_c)(1 - T_g) \qquad (2.1)$$

where I is a firm's pre-tax income, T_d is personal tax rate on

dividends, T_c is the effective rate of corporation income tax, and T_g is the effective rate of personal tax on capital gains.

The expression on the left hand side of the inequality represents the after-tax income available to members of a cooperative regardless of whether income is retained or paid as dividends. The right hand expression represents the after-tax income available to corporate investors if income is retained.

Prior to the Tax Act of 1986, the authors noted that because the effective tax rate on capital gains was so low[1], cooperatives enjoyed a tax advantage on retentions if $T_d < T_c$, or slightly more, depending how close to zero T_g actually was. However, because of diverse personal tax rates (T_d), IOFs and cooperatives may actually face the same marginal cost of capital.[2] The authors noted that "diverse personal tax rates combined with a different tax system is one reason cooperatives and corporations may coexist in long-run equilibrium with their market shares depending on the distribution of farmer's incomes" (p.209).

The study next addressed the issue of the potential growth rates of corporations and cooperatives. It focused on

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[1] A substantial reason the effective tax rate on capital gains is so low is that capital gains are taxed at the time of realization rather than accrual.

[2] In addition to the marginal tax rate, cooperative members must pay FICA tax of 15% that IOF investors avoid.

the differences in growth rates that arose because (1) IOFs are subject to the corporate income tax and (2) cooperatives retire retained earnings with some lag. A fixed debt-equity ratio was assumed for the analysis. Although debt is a significant source of finance, both corporations and cooperatives are thought to be constrained in its use by some maximum ratio. The analysis therefore investigated firm growth on the assumption that internal finance was the only binding constraint on the growth process.

Supposing that a corporation and cooperative earn the same pre-tax rates of return its capital, $r/(1 - T_c)$, if the corporation's income tax is T_c then its after-tax return is simply r. Assuming that the corporation retains R percent of its earnings, maintains its debt-equity ratio, and its capital stock does not depreciate, it will grow at a rate of Rr. A cooperative, under the same assumptions, would experience a growth rate of $Rr/(1 - T_c)$ if it did not have to retire any retentions and it fully allocated all its earnings. With an effective corporate tax rate of $T_c = 0.4$, the authors state that a cooperative could initially acquire capital at a rate two-thirds faster than the corporation.

Because the retained earnings are retired with some lag, the growth rate calculation for a cooperative becomes more complicated. What the authors show is that by varying the level of retentions and the lag period for its retirement, a

cooperative's growth path takes on various values. Newly formed cooperatives may experience rapid growth initially but this rate cannot be sustained once rotation begins. The same is true if a cooperative increases its retention rate. It will realize a spurt in growth that lasts until one rotation period is complete, then the growth rate will diminish.

The results of this study indicate that because of differential tax treatment, cooperatives can for a time grow faster than corporations employing the same retention rate. But, because of equity rotation the growth advantage could swing to corporations over the long run if cooperative's capital cost exceed those of investor oriented firms. Therefore, even if cooperatives have a lower cost of capital advantage over IOFs, they may not be able to translate this advantage into a continuous expansion of their operations and market share.

C. An Earnings Model of Financial Performance

Ultimately, economic performance (profitability) is the source of returns to repay investors and lenders for the risks they assume. Earnings (as opposed to liquidating assets, refinancing, or borrowing more money) are the most desirable and reliable source of funds to make principal and interest payments. A stable trend of positive earnings is one of the best assurances that a firm will be able to borrow when funds

are needed, then eventually repay the debt (Barickman, 1985).

"The relationship between net income and the capital invested in the generation of that income is one of the most valid and most widely recognized measures of enterprise performance" (Bernstein p.102, 1983). The broad category of return on investment (ROI) relates income to the amount of capital needed to generate that income. Bernstein considers ROI the most reliable indicator of long-term financial health, better than common balance sheet measures.

Within the general category of ROI, the return on total assets is perhaps the best measure of operating performance of a business without regard to how the assets were financed. A simplified measure of the returns on assets can be calculated as follows:

$$ROA = (NI + I)/[(BA + EA)/2] \qquad (2.2)$$

where ROA = return on assets,

NI = net income,

I = interest expense,

BA = beginning assets,

EA = ending assets.

Net income is equal to revenues less expenses. Interest is not included in expenses because ROA is a measure of earnings to reward both debt and equity capital. The average value of assets is used because the return earned in a given

period of time should be related to the assets that were available, on average, during that time period. With the year-to-year inventory fluctuations of cooperatives and their non-uniform fiscal year ends, average assets seemed the best choice for measuring rates of return for the study.

The return on owner's equity measures the returns accruing to the owner's investment after the interest payment on debt capital has been met. A simplified measure of return on equity is calculated as:

$$ROE = NI/[(BE + EE)/2] \qquad (2.3)$$

where ROE = return on equity,
BE = beginning equity,
EE = ending equity.

Average equity was used in the measure of return on owner's investment because the value of that investment can fluctuate depending on market conditions, firm performance, and within the context of a cooperative, the rate of equity that is retired in a fiscal year.

Melichar (1985) suggested examining farming operations based on their performance indicated by the relationship between profitability and capital structure. This can be done by examining the reciprocal relationship between the return on equity and the return on assets from the following identity:

$$ROE = ROA - (i(1-t)D/A)/1 - D/A \qquad (2.4)$$

where i = interest rate on debt,

D/A = debt-asset ratio,

t = tax rate.

Return on equity is a function of the return on assets, the after tax interest rate, and the capital structure of the firm. Inversely, ROA is a weighted average of ROE and the after tax interest rate. The weights are the percent equity and the percent debt capital.

This study applies Melichar's approach in examining agricultural cooperatives. However, due to the deductibility of patronage payments prior to tax calculation by cooperatives, the return on equity is a function of the return on assets, the interest rate, and capital structure of the firm.

The differences between the rates of return on equity and assets isolates the effect borrowed capital has on the return to owner's equity. A model can be constructed that captures this relationship between the two measures of return. Figure 2.1 presents a graphical illustration of the model that plots a firm's rate of return measures in ROE and ROA span.

In the model, a firm's return on equity is graphed on the vertical axis and its return on assets is graphed on the horizontal axis. The forty-five degree line cutting the northeast quadrant of the graph represents identical measures of ROE and ROA for a firm. It also represents a boundary over

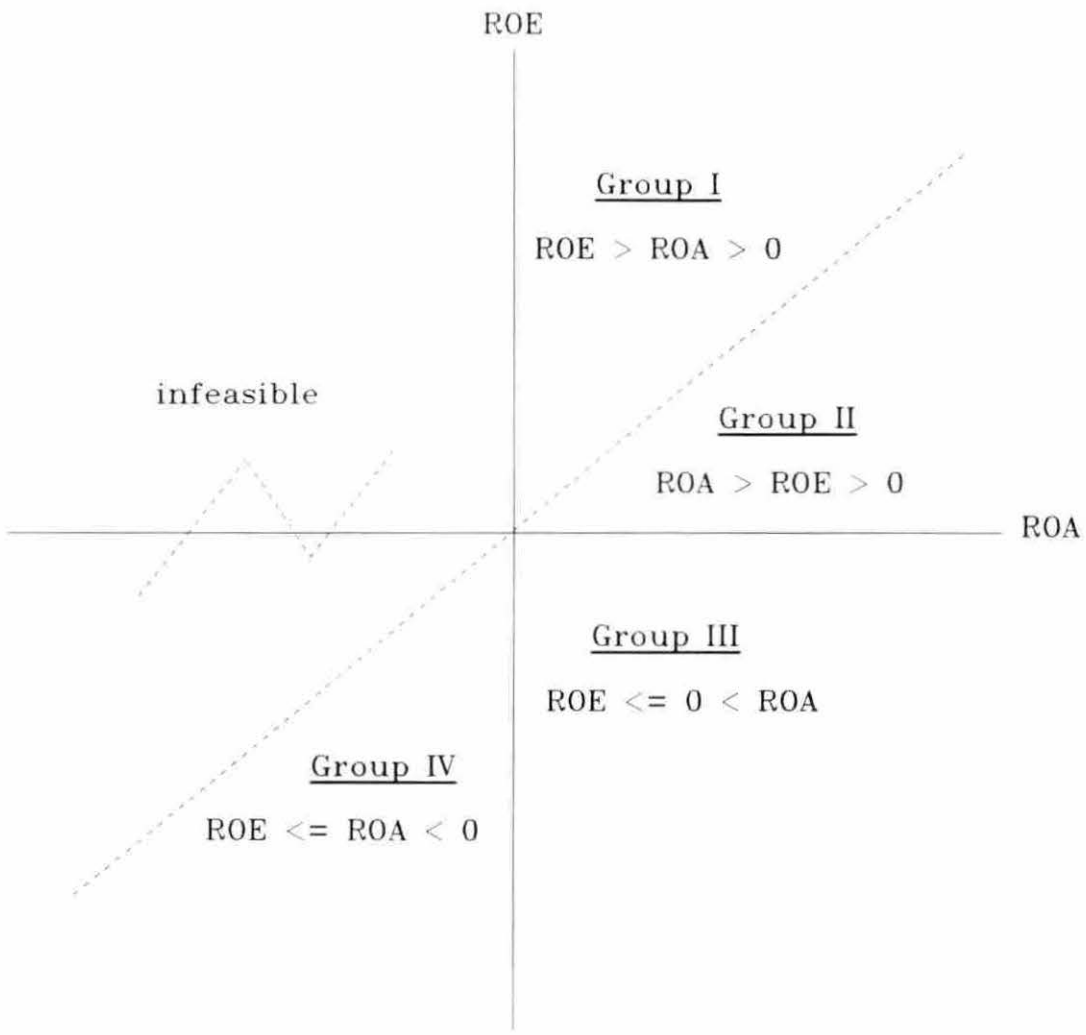

Figure 2.1 Model of Cooperative Profitability

which the debt a firm holds can vary between acting as a positive or negative contribution towards its return on equity.

The forty-five degree line bisecting the southwest quadrant represents a limit between the relationship of ROE and ROA. If both measures of return are negative, then ROE must always be less than or equal to ROA. And, the only possibility of the measures being equal would be the case of a firm whose assets were funded solely with equity capital.

Four profitability groups, based on a firms relative measures of ROE and ROA, are identified and labeled as Group I, II, III, or IV. If ROE is greater than ROA and they are both positive (Group I firms), leverage has a positive contribution to the cooperative's returns to equity. If ROA is greater than ROE and they are both positive (Group II firms), leverage has no effect or some adverse effects on the firm. When the firm's ROA is positive but ROE is negative or zero (Group III firms), leverage has enough of a negative influence on the firm to cause its ROE to fall to or below zero. When ROA and ROE are both negative (Group IV firms) leverage has such an adverse effect on the firm that any debt it holds is a further financial imposition on the firm.

This study calculates these return measures on the data sets for cooperatives identified in the following chapter. Firms are classified by the profitability groups previously

described and the effects of their debt structure are investigated to determine to what extent and degree firm performance and profitability are influenced by the level of debt a cooperative holds.

CHAPTER III. EMPIRICAL PROCEDURES

A. The Data

The data used in this study were financial statements of grain marketing and input supply cooperatives located in Iowa, Nebraska and South Dakota. A seven year time series for a cross-section of cooperatives was used. Financial information was taken from the cooperative's balance sheet, income statement and cash flow statement for each year over the seven year period of the study. In order to establish end points for calculating average assets and equity between balance sheet dates, financial statements were obtained from 1984 to 1991. The actual analysis of the data covers the period from 1985 to 1991.

The analysis examines three sets of financial data. The first set is designated as sample firms and includes all the firms for which financial statements were available. The second set, designated as focus firms, are a subset of the sample firms and represent the firms that were operating continuously over the period of the study. The third set, designated as non-focus firms, were also a subset of the sample firms and they represent firms that discontinued operations at some point over the period of the study. The firms represented in this data set decreased correspondingly with the decrease in the number of firms represented in sample

firms data set.

1. Sample firms

The sample firms in the study included all firms in each year for which data were available and which met the measurement criteria of the study. Cooperatives were excluded if their measure of local equity (equity minus investment in other cooperatives) was negative. Negative local equity produced misleading results when calculating ROE. For example, a firm with an operating loss and negative equity would show a positive measure of ROE.

The sample size decreased in successive years throughout the period of the study. When consolidations, mergers and liquidations occurred, observations were lost from each succeeding year's sample after the event. No data was available to distinguish cooperatives involved in an organizational restructuring or those that simply went out of business.

The model for profitability group classification was applied to the sample firms but the results are not presented in great detail in the analysis. Sample firms were partitioned into focus and non-focus and the model applied and the results analyzed for these two subsets of the sample firms. Nevertheless, financial variable and ratio means are presented and discussed for the sample firms. The judgement was made that analysis of sample firms would yield some useful

information. For example, changes in the averages for the sample reflect changes in the industry through the time period of the study even though they might not be useful in the focus group analysis as designed for this study. Most tables of profitability group variable averages for the sample firms are presented in the appendix.

2. **Focus and non-focus firms**

A subset of the firms that were continuously operating throughout the study period were identified. The focus firms were defined as those firms still operating in 1991 which met the measurement criteria used to calculate financial ratio means. Although they were included in the analysis of the sample firms, a separate analysis was conducted for the focus firms over the same time period (1985-1991). The focus group was identified by examining the firms still in operation at the end of 1991, separating them from the firms operating in preceding years and then measuring their financial performance year by year back through 1985.

An analysis was also conducted on the firms out of the initial sample that ceased operations at some point during the period of the study. Information identifying the reason these firms went out of business was not available and no attempt was made to determine whether they consolidated, merged or were part of an acquisition by another cooperative or private concern. The data available for these discontinued

cooperatives indicate that many of them were experiencing serious financial difficulties prior to their exit from the industry. Therefore, it seemed reasonable to assume that a substantial percentage of these firms were either reorganized with other cooperatives or were liquidated.

It can be hypothesized that the cooperatives still operating in the period at the end of the study have financial structures that differ from those who have ceased operating. By comparing the performance of the focus firms over the period with that of the non-focus firms, an attempt was made to identify fundamental differences in these firm's financial structure. The success of the focus firms should shed some light on the failings of other firms in the sample.

B. Variable Selection, Construction and Description

The financial variables chosen for analysis in this study were obtained from a cooperative's balance sheet, income statement, and flow of funds statement. Financial ratios representing cooperative profitability and solvency were constructed from these variables. A description of the financial variables and the methods of constructing the financial ratios follows.

1. Financial statement variables

The balance sheet and income statement variables examined provided the necessary values for the purpose of calculating

the financial ratios used in the cooperative profitability model. Additional balance sheet variables that proxy the size of operations were also included. The balance sheet variables included sales, term debt, total assets, fixed assets and equity. The income statement variables were local savings (net margins) and interest and depreciation expense.

The flow-of-funds statement variables examined included the source of funds that do not appear in income statements and the uses of those funds which provided information on retention ratios, equity redemption, and fixed asset growth. These variables, for the given year's statement, included term loans, cash patronage payments, equity redemptions, and purchases of fixed assets.

Sample means were calculated for the financial variables in each of the three data sets examined. Variable means were also calculated for the data sets based on the four profitability group categories of the model. The mean for a variable in a particular profitability group can then be compared to the variable's mean in another group as well as to the variable's mean of a representative cooperative in that year. This method of comparing group variable means also allowed the identification of differences in the means among the profitability groups.

2. Financial ratios

As briefly mentioned in A.1 of Chapter II, this study incorporated three financial ratios into the main analysis. A fourth ratio, term debt to total debt was included in a long-run analysis of cooperative. These ratios were chosen based on their ability to accurately measure the performance and economic condition of business firms.

The return on investment ratio, hereafter referred to as return on equity (ROE), measures how well a cooperative's risk capital is performing. It was included in the study for two reasons: 1) To measure the relative performance of the equity capital of cooperatives, and; 2) To serve as an index for measuring debt capital's contribution to a cooperative's profitability.

The ratio was calculated with the following equation:

$$ROE = (NI - PI)/[(BE + EE)/2] \qquad (4.1)$$

where ROE = return on local equity,

NI = net income,

PI = patronage income from investments in other cooperatives,

BE = beginning local equity,

EE = ending local equity.

Net income and patronage income from investments in other cooperatives was taken from a cooperative's income statement. The balance sheet provided the information needed to calculate

a cooperative's local equity. It was calculated by subtracting the balance sheet entry for investments in other cooperatives from the entry for total equity.

A cooperative's average equity in a year was used in the denominator for calculating the ROE measure. This was achieved by using the previous year's closing local equity for beginning equity, adding it to the closing local equity in the year ROE was calculated and then dividing by two. Calculating ROE using average equity rather than beginning or ending equity gave a more representative measure of ROE to the level of equity employed by a cooperative in a given year. This was because equity was being built (or in some cases eroded) during the year. While average equity is not a perfect measure, neither beginning or closing equity were judged to yield measures as accurate as average equity.

The focus of this study was strictly on the performance of equity provided by and under the control of a local cooperative's member-patrons. As a rule, patronage income from regional or other cooperatives is allocated to a local cooperative in the form of equity credits. The income is generally unrealized by the local as cash until the regional decides to revolve it. Thus any equity investments in other cooperatives were not under the direct control of a local's Board of Directors. Since an accurate measure of the performance of the equity at the local level was the focus of

the study a measure of local return on equity was used. This measure eliminated both the earnings from regional patronage and the equity claims against equity credits on the balance sheet.

The return on total assets (ROA) measures how well a firm's assets were used to generate earnings. Because no distinction was made on how the assets are funded, ROA is a measure of the combined effects debt and equity capital had on a cooperative's performance. The measure's inclusion in the study was threefold: 1) ROA is a widely used measure in the literature covering business performance; 2) The ROA measure captures returns from both debt and equity funded assets, and; 3) Its use, combined with an ROE measure, allows identification of the effects that debt and equity capital have on profitability as postulated in the theoretical model.

Two measures of ROA were calculated in the study for purposes of profitability group classification. Both measures were calculated using the cooperative's local assets and local income. Local assets exclude the balance sheet entry cooperatives make to offset the firm's investment in other cooperatives. Local assets were derived by subtracting this entry from a firm's total assets. And, the measure of local income also excluded patronage refunds paid to the local by regional or other cooperatives.

Similar to the average equity figure used to calculate

ROE, the local assets entered in the denominator for the ROA measure represents the average assets available to the cooperative throughout the year. Average assets were derived by summing a firm's beginning of the year local assets with its end of the year local assets and dividing by two. Calculating ROA with average local assets gave better measures of the income generated by these assets over the year.

The first measure of return on assets, hereafter termed return on assets (ROA), was calculated as follows:

$$ROA = [(NI - PI) + INT]/[(BA + EA)/2] \qquad (4.2)$$

where ROA = return on local assets,

INT = interest expense,

BA = beginning local assets,

EA = ending local assets.

The yearly interest expense of a cooperative is included in the numerator for calculating return on assets. This measure of return on assets includes a firm's cost of debt capital in order to capture the asset's return regardless of its funding. ROA was used in one of the formulas used to classify cooperatives by profitability group, although a detailed analysis of the results is not included in the study.

The other measure of return on assets used for the purposes of this study was termed cash return on assets (CROA). CROA was calculated as follows:

$$CROA = [(NI - PI) + INT + DEP]/[(BA + EA)/2] \quad (4.3)$$

where CROA = cash return on local assets,

DEP = depreciation expense.

The only difference between the ROA and CROA measures of return on local assets is that the CROA measure is calculated before depreciation is deducted from a cooperative's income. CROA is a more complete measure of cash flow return on assets. It was included in the study's analysis to capture the returns generated by a firm's assets without consideration of the depreciation policy used on those assets which can vary from firm to firm. This variation occurs not only due to internal policies adopted by the firm but also the IRS rules in effect when major assets were acquired.

The debt-asset (D/A) ratio calculated in the study is a widely used financial ratio applied to studies of business performance. The ratio was calculated as follows:

$$D/A = [(BCD + ECD + BTD + ETD)/2]/[(BA + EA)/2] \quad (4.4)$$

where D/A = debt/local asset ratio,

BCD = beginning current debt,

ECD = ending current debt,

BTD = beginning term debt,

ETD = ending term debt.

The D/A ratio included the total debt of a cooperative. The ratio was calculated on a cooperative's local assets

(assets minus investments in other cooperatives) to capture a more accurate measure of the percentage of those assets funded with borrowed capital. The measure incorporated the firm's average total debt and average local assets to reflect its solvency position throughout the year.

The D/A ratio is a measure of leverage for a business firm. That is, it measures the percentage of the firms assets that were financed by debt capital. Conversely, subtracting the D/A ratio from one yields the fraction of the firm's assets that were financed by equity capital. The D/A ratio is included in this study as a measure of the capacity a cooperative has for expanding its capital base through debt financing.

Another financial ratio examined in the study was term debt to total debt. It was calculated by dividing a cooperative's balance sheet entry for long term debt by its total debt, i.e. current debt and long-term debt. For example, a ratio of fifteen hundredths says that for every dollar of debt the firm holds, fifteen cents of that debt is term debt. The ratio gives an indication of the extent to which a cooperative depends on term debt for financing its operations. Generally a lower term to total debt ratio is preferable to higher ratios due to the interest cost differential between short and long-term loans.

C. Empirical Procedure

The primary empirical procedure used in the study involved a comparison of means across the data sets under examination. All three data sets were treated in a similar manner. In each year of the study, financial variable and ratio means were calculated for the firms in each set. The sample firm means for each variable are representative of industry standards for local grain marketing and input supply cooperatives operating in a given year. An industry standard is useful for comparison purposes in identifying the balance sheet and income statement strengths and weaknesses of the focus firms and non-focus firms.

In addition to calculating variable means for the firms comprising each data set, an analysis of firm performance was conducted using the profitability model presented in Chapter II. An analysis of the cooperative profitability model as applied to the focus firm and non-focus firm data sets was undertaken. Based on a cooperative's return on local equity and local assets measures, firms were classified in one of the four profitability groups outlined by the model. Group means were then calculated for all firms comprising a particular group classification in each year of the study. A comparison of the variable means between the profitability groups and across the two data sets was then conducted.

The study incorporated two measures for return on assets

(ROA and CROA) when classifying cooperatives by profitability groups. Because the criteria for group classification differed between the ROA and CROA methods, there was a substantial difference in the number of firms represented within each of the four groups. Also, there was a similar divergence in the financial variable and ratio means as measured by the two group classification methods. These differences are briefly summarized in the analysis section of the thesis.

1. Profitability groupings after depreciation expense

Using the measure for return on assets before interest but after depreciation (ROA), cooperatives were classified in one of four profitability groups as outlined in the model presented in section D, Chapter II. A firm's classification depended on its relative measures of ROA and return on equity (ROE) in the sample year. Due to a wide variety of factors including (1) the changing economic climate, (2) cooperative's capital structure, (3) changing interest rates, (4) weather related volume changes, and (5) government storage programs, measures of firm profitability varied from year to year. This resulted in different profitability group classification from one year to the next for many of the cooperatives.

Means were calculated within each profitability group for the financial variables and ratios. Tables summarizing these means were then constructed for all four groups each year of

the study. Using ROA and ROE as the group classifying criteria resulted in cooperative representation in all profitability groups throughout the period. Although this method of firm profitability classification produced a larger dispersion of firms across the groups, it was felt that using ROA as the criteria for classifying cooperatives was not sufficiently explanatory to fulfill the research objectives.

2. Profitability groupings before depreciation expense

The second method of analysis used in the study involved classifying the cooperatives into profitability groups based on their return on assets before interest and depreciation (CROA) and ROE. This method of profitability group classification resulted in extensive reclassification of cooperatives within each of the four profitability groups. Most notable were large shifts of Group I firms back into Group II classification, and shifts of firms out of Group IV into Group III classification. No apparent shift of firms occurred between the Group II and Group III classifications. Financial variable and ratios means diverged considerably from the ROA classification method when comparing the two results.

3. Long-run profitability group classification

In addition to classifying cooperatives by profitability group in each year of the sample period, a seven year, long-run profitability group classification was determined for each

firm. Included in the long-run analysis were flow-of-funds statement variables that were deemed useful in isolating factors that influence a cooperative's growth rate and equity policy.

Four variables from a cooperative's flow-of-funds statement were included in the long-run analysis. These variables included a cooperative's fixed asset purchases, cash patronage paid, additions to long-term debt, and equity retired and revolved. Cumulative totals over the sample years were calculated and then divided by the number of years in the period (seven) to obtain long-run averages for each of these variables.

The flow-of-funds statement variables capture all sources and uses of funds for a firm in a given year. The difference between the source and use totals are either additions (sources greater than uses) or deductions (sources less than uses) to a firm's working capital. Although it is essential that a cooperative have adequate levels of working capital available to conduct its day to day operations, the focus in this study was not specifically aimed at analyzing a firm's working capital requirements. Rather, these four variables were related to the acquisition of debt and equity capital and how they influenced the cooperative's growth.

The procedure used to classify a cooperative by its long-run profitability group was simple and straightforward. The

model for cooperative profitability group classification outlined in Chapter II was applied to the long-run groupings. Yearly return on investment measures (ROA, CROA, ROE) were calculated then summed over the seven year period of the study. This sum was then divided by the number of years of the study to obtain a yearly average for each measure of return on investment. Using these yearly averages, a cooperative's long-run profitability group classification was determined. Profitability group means and standard deviations were then calculated for all financial variables and financial ratios under investigation.

Additional financial ratios were calculated for the long-run analysis. These ratios included interest expense to total debt, depreciation expense to fixed assets, local assets to total assets, fixed assets to total assets, equity retired to local equity and fixed asset purchases to depreciation expense. Fiscal-year ratios were calculated for each cooperative and summed over the period. These sums were divided by seven to obtain the long-run average for each of the ratios. Profitability group means and standard deviations were calculated for these ratios for the group classifications.

The additional financial ratios analyzed in the long-run profitability group classifications were chosen because it was felt that these ratios captured firm characteristics that

differed between the profitability groups. The ratios conveyed useful information on cooperatives' asset and flow of funds structure. An analysis of variance was conducted for the financial ratios (and financial variables) to determine if significant differences existed between the profitability groups. The Scheffe procedure was used for the analysis and groups with significant differences between their variable and ratio means were identified.

CHAPTER IV. ANALYSIS

A. Variable Profiles

This chapter presents and discusses the financial variables and ratios calculated for the study's analysis. Tables of financial variable and ratio means were constructed for the sample firms, focus firms, and non-focus firms. The variable and ratio means for each data set are first presented and discussed, then the means calculated by profitability group for focus and non-focus firms are presented and analyzed.

The sample firm's financial variable and ratio means are analyzed first, to identify local grain and production supply cooperatives' industry averages. This was followed by an analysis of the variable and ratio means of focus and non-focus firm data sets. These two data sets are presented and discussed concurrently in order to compare the differences in each set's means. This method of presentation allows identification of the means that deviated substantially across data sets. Isolating key differences of the calculated means between the two data sets may help account for the apparent success (focus firms) or failure (non-focus firms) of these cooperatives.

Next, a presentation and analysis of the profitability group classifications of the focus and non-focus firms was

conducted. The analysis focused on the profitability group classifications derived from the relationship between the CROA measure of return on local assets and ROE. Because CROA included depreciation as well as interest expense in its calculation, this criteria of classifying cooperatives better separated firms with superior rates of return on local equity. Furthermore, using CROA as the criteria for firm classification it can be hypothesized that the cooperatives classified as Group I firms are not only realizing superior returns on their equity investments but are capable of sustained growth while replacing fixed assets and revolving past equity issued.

The next section of the analysis examined cooperative's financial performance based on its long-run CROA/ROE group classification. Long-run classifications were obtainable only for those firms operating throughout the sample period. Thus the long-run analysis was applicable only to the focus firm's data set. Variable and ratio profiles were obtained for all firms in each of the profitability group categories in the long-run. Specific flow-of-funds statement variables were also examined to determine if categorical differences between the profitability group means existed.

1. Financial variable and ratio means

The following tables present the financial variable and ratio means calculated for the data set representing sample

firms. This data set included all the firms for which financial statements were available and which met the measurement criteria of the study in each of the years under investigation. The variable means are representative financial statement variables of an average local grain marketing and input supply cooperative that operated over the period. The first table of financial variable means is presented in Table 4.1.

The first column of the table lists the years that the financial performance of local cooperatives were examined. The second column (N) represents the number of firms for which variable means were calculated in each year. The sample size decreased each year due to operational restructuring or firm failure. The number of firms dropping from the sample varied from year to year with the largest loss of firms occurring between the first three years (1985-1987) and the last two years (1990-1991) of the study.

In the final year of the study, the sample firms that were still in operation were also identified as the focus firms and partitioned as such from sample firms for analysis in all prior years. A result of this partitioning was that the financial variable and ratio means of these two data sets were identical for 1991. This fact is evident when examining the variable and ratio means in 1991 for the two separate data sets.

Table 4.1 Financial variable means of sample firms (in dollars)

Year	N	Sales	Termdebt	Local Asset	Fixed Assets
1985	219	8,915,747	455,480	2,607,493	1,166,668
1986	202	8,096,707	404,096	2,569,919	1,235,929
1987	187	8,672,680	363,382	2,956,717	1,312,069
1988	181	11,628,824	348,690	3,754,472	1,378,577
1989	173	14,447,473	340,143	3,865,247	1,443,638
1990	167	14,591,464	388,248	4,288,904	1,569,293
1991	152	15,436,028	477,217	4,988,678	1,769,460

The average cooperative's sales dropped nearly ten percent in 1986 from 1985 levels, then recovered slightly in 1987. These sales results were partly a reflection of a large grain inventory build-up due to a government price support program. As government program-induced inventories were liquidated in 1988 and 1989, an average cooperative's sales increased substantially, over thirty percent in 1988 and nearly twenty-five percent in 1989. Sales leveled off in 1990 then exhibited only a moderate increase in 1991. By 1991, an average cooperative's sales had increased by approximately seventy-five percent over its 1985 level.

As cooperatives sought to reduce the high levels of long-term debt acquired in the early 1980's, average term debt decreased successively from 1985 to 1989. By 1989, the average cooperative's term debt was less than seventy-five

percent of its 1985 level while average cooperative's sales had increased by sixty percent of 1985 levels. In 1990, term debt rose by more than ten percent of 1989 levels and in 1991 jumped by nearly twenty-five percent over its 1990 level. By 1991, the term debt mean was only slightly higher than it was in 1985.

With the exception of 1986, an average cooperative's local assets increased consistently over the period of the study. Substantial increases occurred in 1988 and 1991 over previous year's levels. The trend of a growing local asset base coupled with decreased levels of long-term debt indicated a growing reliance by cooperatives on equity or short-term debt to finance assets. By 1991, the average cooperative's local assets were approximately ninety percent greater than their 1985 level.

The fixed assets of an average cooperative also increased in each year over the period of the study. The most substantial increases occurred between 1989 and 1991. By 1991, the sample firm's fixed asset mean had increased by over sixty percent of its 1985 level. The yearly increase in this mean paralleled the yearly decline of the number of sample firms. The growth of an average cooperative's fixed assets was reflected in the expansion of operations and the service area claimed by many locals.

The remaining sample firm financial variable means

calculated in the study are presented in Table 4.2. The last three columns of financial variable means captured a cooperative's cash flow that was used to calculate rate of return on local assets.

The equity position of an average local cooperative improved considerably throughout the period. Substantial increases occurred in 1987, a year in which the sample lost fifteen firms and in 1988, a year after high local margins were captured. By 1991, average equity had increased by over seventy percent of its 1985 level. This equity growth was, in part, an outcome of the growth in size and operations of many local cooperatives as they expanded their service territories to capture the unserved markets and memberships that resulted from failure of a neighboring cooperative or proprietary firm. Part of the growth was also a result of the more successful firms increasing their member investment by offering new and expanded services that effectively increased member patronage.

Over the period, the local net income (margins) mean of the sample cooperatives ranged from a low of $24,535 in 1985 to a high of $291,802 in 1987. Cooperative incomes realized substantial improvements in 1986 and 1987 as production and marketing conditions were generally favorable in the grain and farm input supply industry. Despite the drought in 1988, cooperative incomes remained strong, in part, due to the liquidation of inventories accumulated during the

Table 4.2 Financial variable means of sample firms 1985-1991 (in dollars)

Year	N	Local Equity	Margins	Interest	Depreciation
1985	219	1,298,287	24,535	113,617	152,179
1986	202	1,407,862	154,750	84,254	160,238
1987	187	1,636,907	291,802	61,384	170,699
1988	181	1,824,761	279,357	82,823	180,479
1989	173	1,927,655	167,814	110,894	189,278
1990	167	2,050,267	172,585	111,599	200,980
1991	152	2,210,091	135,436	110,369	225,439

government's price support program. However, by 1991, the average cooperative's income had substantially deteriorated (by over fifty-five percent) from its peak level in 1987.

As cooperatives struggled to reduce the often disastrously high debt levels they acquired in the late seventies and early eighties, and as the cost of borrowing funds gradually improved, the sample mean for interest expense was reduced by nearly fifty percent between 1985 and 1987. However, this improvement in the borrowing costs experienced by an average cooperative was short lived as the interest expense mean rose in the remaining years of the study. This occurred despite the fact that, with the exception of 1991, cooperatives were reducing or maintaining their levels of long-term debt (see table 4.1). The increased borrowing costs

from 1988 through 1991 resulted from increased use of short-term debt (seasonal loans) to finance growing current assets. This interest obligation on current assets such as inventory and accounts receivable represented a less serious threat to solvency than the long-term interest problem in the period.

The growth in the sample mean for depreciation expense over the period paralleled the growth of an average cooperative's fixed assets. Data pertaining to cooperative's choice of depreciation schedules was not available, but throughout the sample period the average depreciation rate was approximately thirteen percent of the mean value of the fixed assets. However, when the sample firms were partitioned into focus and non-focus firms and subsequently analyzed, variations in depreciation rates became more apparent.

Table 4.3 presents the financial ratio means for sample firms in each year of the study. Since subsequent analysis of focus and non-focus firm's profitability group classification used CROA and ROE as the classifying criteria, the discussion on the sample firm's financial ratio means is confined to these two ratios and the debt/asset ratio. The other ratios for return on local assets are included in the table merely to reflect the effects interest and depreciation expenses had on return on investment measures.

The sample mean for the CROA ratio ranged from a high of 17.73 percent in 1987 to a low of 9.40 percent in 1991. The

Table 4.3 Financial ratio means of sample firms 1985-1991 (in percentages)

Year	N	RROA	ROA	CROA	ROE	D/A
1985	219	0.46	4.56	10.25	-2.62a	48.48
1986	202	5.20	8.29	14.47	8.37	44.02
1987	187	9.52	11.54	17.73	16.44	39.87
1988	181	7.71	9.83	15.31	13.37	43.02
1989	173	3.95	6.42	11.57	5.40	44.26
1990	167	3.71	6.14	11.32	3.92	44.41
1991	152	2.27	4.33	9.40	1.73	47.17

a) Although the net local margin mean was positive, the extremely negative, unweighted ROE of a few firms produced the data set's negative ROE mean.

increase in this ratio over the first three years of the study was a direct result of the improved earnings realized by the sample cooperatives. As earnings leveled off in 1988 and then declined through 1991, the CROA ratio also declined. Even though interest and depreciation expenses increased the last three years of the study, the declining CROA mean resulted from reduced earnings with an expanded local asset base.

Due to unusually large operating losses experienced by many cooperatives in 1985, the sample mean for ROE was a negative 2.62 percent for the year. High borrowing costs negatively affected many cooperative's ROE as well. As earnings improved and borrowing costs declined the sample mean for ROE increased dramatically to its seven year high of 16.44

percent in 1987. Declining margins and increasing interest expenses the following years were chiefly responsible for lower ROE means, although larger equity means were a contributing factor as well. By 1991, a representative cooperative was realizing an extremely low but positive return on its owner's investment.

The mean for the total debt/local asset ratio of sample firms ranged from a high of 48.48 percent in 1985 to a low of 39.87 percent in 1987. Between these years sample cooperatives were reducing their long-term debt without greatly increasing their level of seasonal (short-term) borrowing. Beginning in 1988 and through 1991, cooperative seasonal borrowing increased greatly. This trend was highlighted when the decrease in the sample term debt mean was compared to the local asset and D/A ratio means, which simultaneously increased from 1988 to 1990. Then the substantial increase in the term debt mean in 1991 raised the average D/A mean for the sample to its highest level in six years.

The next section of the analysis investigated the financial variable and ratio means calculated for focus and non-focus firms. Tables summarizing the calculated means were constructed for each data set. Individual tables that summarized the same variable and ratio means for each data set are presented together. The means across tables are compared

to identify financial characteristics that differentiated the two groups of firms.

The first four financial variable means are presented in Tables 4.4 and 4.5. The number of firms represented in the focus firm tables varied slightly over the sample period for two reasons: 1) Two firms had negative measures of local equity in 1985, 1986, 1987 and 1989, and one firm had a negative measure of local equity in 1988; and, 2) There was a missing observation in 1986 disallowing asset and equity averaging. The decreasing size of the non-focus firm data set from 1985 to 1991 was a result of the convergence of the sample firm's data set through the period to the become the focus firm data set in 1991.

In comparing the financial variables of the two sets of firms, the most striking difference is the size of the cooperatives represented, as measured by the sales and fixed and local asset means. By sales, the focus firms are over fifty percent larger to nearly twice the size of non-focus firms in a given year. Likewise, as measured by the local and fixed asset means, focus firms are fifty percent to nearly twice as large as non-focus firms. As a group, the cooperatives that either failed or were reorganized with other cooperatives over the seven years of the study appeared to have been concentrated among firms whose sales and local and fixed asset means were below the industry average, as given

Table 4.4 Financial variable means of focus firms 1985-1991 (in dollars)

Year	N	Sales	Termdebt	Local Assets	Fixed Assets
1985	150	10,533,443	501,584	3,043,238	1,342,869
1986	149	10,570,884	504,114	2,881,284	1,346,630
1987	149	9,547,590	381,090	3,243,478	1,432,175
1988	151	12,510,410	374,900	4,035,679	1,471,515
1989	150	15,275,577	369,235	4,097,301	1,532,436
1990	152	15,120,292	405,763	4,464,645	1,634,111
1991	152	15,436,028	477,217	4,988,678	1,769,460

Table 4.5 Financial variable means of non-focus firms 1985-1990 (in dollars)

Year	N	Sales	Termdebt	Local Assets	Fixed Assets
1985	69	5,399,004	346,287	1,660,221	783,622
1986	53	5,057,946	318,588	1,694,570	831,303
1987	38	5,242,115	293,728	1,832,313	841,129
1988	30	7,191,508	220,914	2,339,061	910,792
1989	23	9,046,793	153,612	2,341,762	864,523
1990	15	9,232,676	197,329	2,508,052	912,468

in table 4.1.

Focus firm's term debt means generally followed that of the industry average, decreasing through 1989 then increasing the last two years of the period. The term debt means of the non-focus firms, however, decreased in each successive year of the period, even as their sales and fixed asset means were

rising. Their ability to secure long-term financing obviously had been reduced due to financial pressure and difficulties revealed more fully in subsequent tables showing cash flows.

Both group of firms local asset means followed a similar trend as the industry average, with the exception of the non-focus firm's local asset mean increasing in 1986. Again, the difference in the size of operations between the two data sets are reflected in the local asset means.

Tables 4.6 and 4.7 present the remainder of the financial variable means for focus and non-focus firms respectively. Of interest here was the difference between the two groups with respect to their margins and interest and depreciation expense means. It should be noted, though, that as measured by the groups equity means, the focus firms had larger levels of local equity than the industry average and the non-focus firms had levels below that of the industry average.

The net margin means of focus firms was substantially greater than those of non-focus firms throughout the study. In 1985, the later firms had a negative mean for margins, and in 1990 their average margin was approximately one-fifteenth the average of the focus firms. The negative average for margins in 1985 and its low average in 1990 translated into a greater loss of cooperatives from this data set in the years immediately following these poor margins, i.e. sixteen fewer in 1986 and fifteen fewer in 1991 (zero non-focus firms in the

Table 4.6 Financial variable means of focus firms 1985-1991 (in dollars)

Year	N	Local Equity	Margins	Interest	Depreciation
1985	150	1,541,394	44,728	126,117	178,935
1986	149	1,599,628	188,759	89,198	180,562
1987	149	1,796,272	328,980	64,182	188,547
1988	151	1,954,552	311,629	86,788	194,519
1989	150	2,040,343	185,418	114,873	201,391
1990	152	2,130,848	188,372	115,198	209,389
1991	152	2,210,091	135,436	110,369	225,439

Table 4.7 Financial variable means of non-focus firms 1985-1990 (in dollars)

Year	N	Local Equity	Margins	Interest	Depreciation
1985	69	769,793	-19,361	86,442	94,015
1986	53	868,746	59,137	70,634	103,101
1987	38	1,012,026	146,023	50,855	100,715
1988	30	1,171,482	116,923	62,728	109,810
1989	23	1,187,832	53,007	84,668	110,278
1990	15	1,233,710	12,609	76,081	115,773

final year of the study). Clearly, focus firm's ability to generate positive earnings was a contributing factor for their survivability.

The interest expense mean of the two groups generally followed the trend for the industry average. In 1990, the

non-focus firm's interest mean did drop from the previous year while the focus firm's mean rose. Interest, as a percentage of the term debt mean, generally varied between sixteen and thirty percent for both firm groups. This percentage generally improved between 1985 and 1988 as cooperatives attempted to reduce their long-term commitments. However, beginning in 1989, interest payments began to represent a larger percentage of the average firm's term debt. This was especially true for the non-focus firms. In 1989, their interest mean represented over fifty percent of long-term debt and nearly forty percent in 1990.

The depreciation expense mean of two data groups exhibited increases over the period, with the exception of a slight decrease in this variable for non-focus firms in 1987. The rate of increase in this mean was larger for the focus firms, reflecting higher levels of fixed assets purchased by these firms.

The financial ratio means for the two groups of firms are presented in tables 4.8 and 4.9. The following discussion will focus on the group's cash return on assets (CROA), return on equity (ROE), and the debt-asset ratio (D/A).

In all years of the study, the focus firm's group mean varied from two to three-and-a-half percentage points higher than the non-focus firm's group mean. Focus firm's CROA mean was above ten percent in all years except 1991. Non-focus

Table 4.8 Financial ratio means of focus firms 1985-1991 (in percentages)

Year	N	RROA	ROA	CROA	ROE	D/A
1985	150	1.20	5.13	10.95	-0.58a	47.93
1986	149	6.32	9.18	15.38	11.27	43.21
1987	149	10.08	11.98	18.20	18.00	39.96
1988	151	8.39	10.41	15.86	14.86	43.06
1989	150	4.34	6.72	11.86	6.00	44.30
1990	152	4.07	6.44	11.62	4.53	44.30
1991	152	2.27	4.33	9.40	1.73	47.17

a) The negative ROE mean resulted from a extremely negative ROE of one of the focus firms.

Table 4.9 Financial ratios of non-focus firms 1985-1990 (in percentages)

Year	N	RROA	ROA	CROA	ROE	D/A
1985	69	-1.15	3.31	8.72	-7.04a	49.70
1986	53	2.03	5.78	11.90	0.21	46.30
1987	38	7.32	9.78	15.88	10.31	39.53
1988	30	4.30	6.94	12.56	5.91	42.83
1989	23	1.36	4.45	9.68	1.49	43.96
1990	15	0.07	3.06	8.31	-2.19a	45.56

a) One firm had an extremely negative ROE which was disproportional to its weight for the mean.

firm's had a CROA above ten percent in just three of the six years ratios were calculated for these firms. Higher margins accounted for most of the improvement in the CROA mean of the two groups, especially in the middle years of the study. And

although both groups had lower margins with higher levels of local assets in 1989 and 1990, their increased interest and depreciation expenses were sufficient to maintain their CROA at higher levels than in 1985.

The greatest divergence in financial ratios between the two sets of firms occurred in the measure of ROE. In all years of the study, focus firms had far superior measures of this ratio than did the non-focus firms. Because the ratio mean calculations were unweighted, focus firms had a negative ROE mean in 1985 even though their net margin's mean was positive. This was true of the non-focus firms in 1990 as well. Due to the negative net margin mean in 1985, non-focus firm's ROE mean was also negative. Except for 1987, non-focus firm's had very low measures of ROE compared to the industry's average. Low returns on owner's investment partly explained why, as a group, these non-focus firms were reorganized or went out of business.

The trend in the debt-asset ratio mean of both groups of firms paralleled that of the industry average. Relatively high ratios in 1985 were followed by improvements (lower ratio) in 1986 and 1987. Both group's D/A ratio mean began rising again in 1988 and continued to increase through the end of the period. Non-focus firms had a higher D/A ratio than the focus firms in 1985 and 1986, but beginning in 1987, the focus firms had a higher D/A ratio mean for the remaining

years. Though term debt was declining through these years (except in 1990 and 1991), the higher D/A ratio for 1987 onward seemed to indicate a heavier reliance by both data groups on short term debt financing.

2. Profitability group classification financial variable and ratio means

The model used to classify cooperatives by profitability groups was applied to sample firms. Financial variable and ratio means were calculated for each of the four profitability groups. The tables summarizing the results of that analysis are not presented here but have been included in the appendix for reference.

The following analysis examined the results when the profitability group model was applied to the focus firms and non-focus firms. The tables for variable and ratio means are presented together to better compare and contrast the differences between the two groups of firms. Because the focus of this study is on a cooperative's ability to generate cash flows sufficient enough to reward owner's equity, revolve equity on a timely basis, and simultaneously permit organizational growth, the analysis concentrates on the Group I firms. However comment on the other profitability group means is made when appropriate.

Since the profitability group classifications were determined by the relationship between a cooperative's rate of

return on assets (CROA) and its rate of return on owner's investment (ROE), the analysis was started by examining the financial ratios calculated for focus and non-focus firms. This served to provide a necessary background when analyzing profitability group financial variable means. This was especially helpful when examining the financial variables which determined a firm's cash flow, i.e. net local margins, and interest and depreciation expense.

The CROA means by profitability group classification for the focus and non-focus firms are presented in Tables 4.10 and 4.11 respectively. Group I non-focus firms had the greatest variability in absolute CROA means across the data sets and also had the two highest measures of this mean in 1986 and 1989, based on a small number of firms. The high means in these years resulted from exceptionally high interest and depreciation expenses posted by the firms comprising the group. Other than these two exceptions, there was not great variability between the CROA mean measures between the Group I and II focus and non-focus firms.

The measures of CROA across most profitability groups increased in the years that were most favorable for the industry at large (1986-1988). Over this period, the percentage of firms classified as Group I and II cooperatives was the greatest while Group III and IV had the lowest percentage of cooperatives classified in them. No focus firms

Table 4.10 Profitability group CROA means of focus firms in 1985-1991 (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	16.74 (15)	12.99 (88)	6.50 (41)	-3.04 (6)
1986	19.15 (34)	15.95 (93)	7.12 (22)	0 (0)
1987	20.73 (58)	16.95 (87)	8.90 (4)	0 (0)
1988	18.02 (59)	14.99 (85)	8.17 (7)	0 (0)
1989	16.08 (38)	12.97 (82)	5.02 (24)	-2.59 (6)
1990	14.78 (23)	12.88 (98)	5.53 (30)	a (1)
1991	13.13 (17)	11.44 (91)	4.99 (39)	-6.01 (5)

a) Omitted to prevent disclosure.

Table 4.11 Profitability group CROA means for non-focus firms in 1985-1990 (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	18.84 (2)	13.14 (31)	7.77 (29)	-9.81 (7)
1986	22.85 (4)	14.19 (32)	6.17 (15)	-3.77 (2)
1987	19.55 (9)	14.80 (28)	a (1)	0 (0)
1988	16.41 (4)	13.43 (23)	4.43 (2)	a (1)
1989	25.07 (2)	10.67 (13)	5.22 (7)	a (1)
1990	a (1)	16.13 (6)	4.47 (6)	-4.88 (2)

a) Omitted to prevent disclosure.

were classified as Group IV in these three years.

The high CROA means of the focus firms in 1986-1988 were more a result of improved net local margins than of increased interest and depreciation expenses. Tables presented later in the study will demonstrate that this group of firms generally

had lower interest expense with higher depreciation expense, an indication of fixed asset growth with lower interest costs.

The profitability group ROE means of focus and non-focus firms are presented in Tables 4.12 and 4.13. Again, with the exception of Group IV firms, the Group I non-focus firms demonstrated the greatest variability in their ROE mean across the profitability groups in both data sets. The sensitivity of ROE measures to the debt-asset ratio partly accounted for the extremely high measure of ROE for this group in 1986 (see Table 4.15). Financing assets with mostly debt capital resulted in higher measures of ROE. ROE sensitivity to the debt-asset ratio also accounted for the higher negative values of ROE associated with Groups III and IV in both data sets.

Because the ROE measure was strictly derived from net local margins, after interest and depreciation expenses, the highest values for the ratio among Groups I and II firms occurred in the most profitable years in the industry (1986-1988). Of all firms comprising the focus firm data set, the percentage of firms represented as Group I was the highest during this period. And as their ROE means demonstrated, this Group, on average, had extremely positive rates of return on their owner's investment. The ROE means were not greatly boosted by high debt-asset ratio means (see Table 4.14).

A final note on these tables is in order. Of the firms comprising the data set each year, the percentage of non-focus

Table 4.12 Profitability group ROE means for focus firms in 1985-1990 (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	20.38 (15)	6.38 (88)	-15.48 (41)	-53.28 (6)
1986	25.70 (34)	10.84 (93)	-9.25 (22)	0 (0)
1987	27.96 (58)	12.58 (87)	-8.68 (4)	0 (0)
1988	23.14 (59)	10.91 (85)	-7.09 (7)	0 (0)
1989	19.62 (38)	8.50 (82)	-13.32 (24)	-37.22 (6)
1990	18.44 (23)	7.97 (98)	-15.86 (30)	a (1)
1991	16.18 (17)	7.10 (91)	-11.64 (39)	-40.84 (5)

a) Omitted to prevent disclosure.

Table 4.13 Profitability group ROE means of non-focus firms in 1985-1990 (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	28.09 (2)	7.66 (31)	-13.30 (29)	-56.24 (7)
1986	39.49 (4)	8.55 (32)	-9.49 (15)	-138.93 (2)
1987	26.20 (9)	9.45 (28)	a (1)	0 (0)
1988	20.11 (4)	7.79 (23)	-12.04 (2)	a (1)
1989	25.95 (2)	5.08 (13)	-8.70 (7)	a (1)
1990	a (1)	10.12 (6)	-11.65 (6)	-17.27 (2)

a) Omitted to prevent disclosure.

firms represented in either Group III or Group IV was highly disproportional to the number of firms each year. That is, a greater number of these firms were represented in Groups III and IV than in Groups I and II. And the ROE mean of firms represented in III and IV had often extremely large negative

values. Poor rates of return on owner's investment coupled with high debt-asset ratios may have been instrumental for the firms that discontinued operations.

The profitability group debt-asset ratio means for focus and non-focus firms are presented in Tables 4.14 and 4.15. With a couple exceptions, the ranking of the data sets' D/A ratio followed the same pattern. Group IV firms had the highest and most extreme D/A ratio means in nearly all years of the study that this group was represented. Group III firms had the second highest D/A ratio means in most years, and the highest means in those years when no firms were classified into Group IV. Group II firms posted the lowest D/A ratio mean throughout the period and Group I firms consistently had the second lowest measure of this mean.

As postulated by the model of cooperative profitability, Group I firm's profitability was enhanced by the levels of debt they held. Optimal D/A ratios for focus firms appeared to be in a range of fifty to fifty-five percent. The D/A ratio of the non-focus firms radically fluctuated from year to year. In 1987 when this data set had the highest representation of Group I firms, the D/A ratio mean fell within the range found in Group I focus firms but in other years the mean demonstrated no consistent value.

While the Group II firms had the lowest D/A ratio means, their rate of return on assets still exceeded their rate of

Table 4.14 Profitability group means of debt-asset ratio for focus firms, 1985-1991 (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	55.03 (15)	42.51 (88)	54.54 (41)	64.51 (6)
1986	55.72 (34)	36.37 (93)	52.78 (22)	0 (0)
1987	50.87 (58)	32.07 (87)	53.45 (4)	0 (0)
1988	51.40 (59)	35.63 (85)	62.91 (7)	0 (0)
1989	50.64 (38)	37.44 (82)	51.57 (24)	65.34 (6)
1990	51.20 (23)	38.60 (98)	56.70 (30)	a (1)
1991	55.04 (17)	40.18 (91)	58.92 (39)	56.02 (5)

a) Omitted to prevent disclosure.

Table 4.15 Profitability group means of debt-asset ratio for non-focus firms, 1985-1990 (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	48.71 (2)	43.02 (31)	54.35 (29)	60.29 (7)
1986	66.91 (4)	41.49 (32)	46.12 (15)	83.51 (2)
1987	51.18 (9)	33.73 (28)	a (1)	0 (0)
1988	48.74 (4)	40.58 (23)	45.49 (2)	a (1)
1989	42.29 (2)	39.31 (13)	51.86 (7)	a (1)
1990	a (1)	34.31 (6)	61.26 (6)	35.69 (2)

a) Omitted to prevent disclosure.

return on owner's investment. It was possible that these firms could have shown improved ROE had they employed more debt, especially during the industry's better years. And although Group III focus firms generally had levels of debt that were more in line with Group I firms, the interest on

that debt had enough of a negative influence on their earnings to drive their ROE below zero.

Profitability group means were calculated for each of the eight financial variables examined in this study. Sales means of the four profitability groups for focus and non-focus firms are presented in Tables 4.16 and 4.17.

The sales mean figures in the tables are given in thousands of dollars. The number in parentheses after each mean shows the number of firms classified in a particular profitability group for that year. These numbers summed across the four groups in a given year equaled that year's data set size. Several conventions were adopted for these tables and all subsequent tables summarize labels for profitability group financial variable and ratio means. There is no change in the numbers in parentheses among the tables except in the table for term debt where means where calculated only for the cooperatives that reported term debt.

The Group I focus firms were comprised mostly of the larger cooperatives as measured by the sales means. Their sales mean was the highest in years with the lowest number of firms represented by that group. As the industry's overall performance improved in the middle years of the study and more firms were classified as Group I cooperatives, their sale's mean declined, but then increased again as fewer firms were represented in Group I. The percentage of focus firms

Table 4.16 Profitability group sales means of focus firms in thousands of dollars (number of firms)

Year	Group I	Group II	Group III	Group IV
1985	19,812 (15)	9,698 (88)	9,257 (41)	8,317 (6)
1986	14,617 (34)	7,528 (93)	7,744 (22)	0 (0)
1987	13,685 (58)	6,862 (87)	7,964 (4)	0 (0)
1988	15,320 (59)	10,846 (85)	9,044 (7)	0 (0)
1989	19,940 (38)	13,761 (82)	12,541 (24)	17,371 (6)
1990	21,887 (23)	14,283 (98)	12,055 (30)	a (1)
1991	36,163 (17)	13,084 (91)	13,054 (39)	6,341 (5)

a) Omitted to prevent disclosure.

Table 4.17 Profitability group sales means of non-focus firms in thousands of dollars (number of firms)

Year	Group I	Group II	Group III	Group IV
1985	7,438 (2)	4,997 (31)	6,216 (29)	3,214 (7)
1986	10,790 (4)	4,673 (32)	3,927 (15)	8,233 (2)
1987	8,002 (9)	4,245 (28)	a (1)	0 (0)
1988	12,631 (4)	6,462 (23)	4,277 (2)	a (1)
1989	23,546 (2)	8,189 (13)	7,342 (7)	a (1)
1990	a (1)	8,260 (6)	8,259 (6)	4,201 (2)

a) Omitted to prevent disclosure.

classified as Group I cooperatives in a year exceeded non-focus firm Group I classifications. This result suggested that in a less than favorable economic climate, a cooperative's scale of operations positively influenced the rate of return on owner's equity.

The sales means of both Group I and II focus firms exceeded that of the non-focus firms in all years but one. The exception in 1989 resulted from the small sample size (2) of Group I non-focus firms. Even within the Group III and IV profitability classifications, focus firm's sales means were higher than the non-focus firm's means. In view of the fact that all of the non-focus firms eventually were reorganized or liquidated it may be hypothesized that a necessary, though not sufficient, condition for a cooperative's long term viability is a minimum scale of operations.

The term debt means by profitability group classification are presented in tables 4.18 and 4.19. Cooperatives that reported no term debt in a year were omitted from the means calculation. The numbers in parentheses represented the firms that reported term debt in the year.

The percentage of firms within a group that reported term debt in a year was highest among Group III and Group IV classifications for both data sets (see numbers in parentheses in Tables 4.16 and 4.17). These two groups tended to have relatively high term debt means in most years.

Group II firms generally had the lowest mean for term debt among the four profitability classifications in the data sets. The group also had, as a percentage of firms in the group, the fewest firms that reported term debt in most years. During periods of higher margins (1986-1988) Group II focus

Table 4.18 Profitability group term debt means of focus firms in thousands of dollars (number of firms)

Year	Group I	Group II	Group III	Group IV
1985	397 (12)	552 (83)	608 (39)	416 (26)
1986	508 (32)	395 (80)	457 (20)	0 (0)
1987	490 (48)	297 (66)	463 (4)	0 (0)
1988	476 (50)	278 (61)	521 (6)	0 (0)
1989	398 (26)	310 (57)	410 (20)	443 (5)
1990	486 (16)	318 (69)	623 (23)	a (1)
1991	768 (12)	348 (64)	620 (33)	498 (3)

a) Omitted to prevent disclosure.

Table 4.19 Profitability group term debt means of non-focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	547 (2)	343 (21)	374 (29)	118 (5)
1986	880 (4)	270 (27)	246 (11)	a (1)
1987	341 (9)	238 (20)	a (1)	0 (0)
1988	157 (2)	198 (19)	163 (2)	a (1)
1989	a (1)	105 (10)	237 (5)	a (1)
1990	0 (0)	93 (3)	277 (6)	a (1)

a) Omitted to prevent disclosure.

firms, on average, reduced their long term debt. But as margins declined, these firms supplemented their lower earnings with higher levels of term debt.

Group I and Group II non-focus firms, with one exception in 1986, reduced their long-term borrowing through the end of

the period. It may have been that these firms, due to pending financial difficulties, had less access to long-term funds than their focus firm counterparts.

A relatively high percentage of Group I focus firms employed term debt. These firms increased their level of borrowing long-term funds during some of the most profitable years (1986-1988) for the industry. In the face of declining margins in 1990 and 1991, the fewer but larger firms classified as Group I had an increased term debt mean. Larger firms would naturally be expected to employ greater levels of term debt, but the substantial increase in this mean in 1991 indicated greater debt levels of the firms that borrowed.

The local and fixed assets of the focus firms are displayed in Tables 4.20 and 4.21. These two asset categories are presented and discussed together by data set in order to better identify and analyze the asset mix of firms in the different profitability groups.

The local and fixed asset means of Group I firms were the highest of the profitability groups in all years of the study. In asset size, the mean's ranking followed an order of Group II, Group III, and Group IV firms. The only exception to this pattern was in 1989 when the two asset categories' mean for Group IV firms ranked third. This mean's ranking was raised due to larger cooperatives classified as Group IV in that year.

Table 4.20 Profitability group local asset means of focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	4,831 (15)	3,003 (88)	2,557 (41)	2,482 (6)
1986	4,027 (34)	2,615 (93)	2,236 (22)	0 (0)
1987	4,375 (58)	2,528 (87)	2,404 (4)	0 (0)
1988	5,174 (59)	3,358 (85)	2,671 (7)	0 (0)
1989	5,337 (38)	3,743 (82)	3,020 (24)	5,212 (6)
1990	6,408 (23)	4,280 (98)	3,620 (30)	a (1)
1991	10,715 (17)	4,340 (91)	4,300 (39)	2,707 (5)

a) Omitted to prevent disclosure.

Table 4.21 Profitability group fixed asset means of focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	1,425 (15)	1,412 (88)	1,214 (41)	1,006 (6)
1986	1,631 (34)	1,377 (93)	960 (22)	0 (0)
1987	1,754 (58)	1,239 (87)	954 (4)	0 (0)
1988	1,770 (59)	1,319 (85)	803 (7)	0 (0)
1989	1,881 (38)	1,466 (82)	1,236 (24)	1,421 (6)
1990	2,153 (23)	1,642 (98)	1,232 (30)	a (1)
1991	3,318 (17)	1,672 (91)	1,464 (39)	663 (5)

a) Omitted to prevent disclosure.

Of interest in these tables was the proportion or ratio of fixed assets to local assets. For Group I firms, this proportion ranged between thirty and forty percent in all of the sample years. For Group II firms, the proportion ranged

from approximately thirty-nine to over fifty percent. Thirty to fifty percent of Group III's total assets were fixed assets. And twenty-five to forty percent of Group IV's total assets were fixed. When compared to similar proportion of fixed assets to total assets in the non-focus firm data set, the usefulness of the ratio became apparent.

The local and fixed asset means, by profitability group, for non-focus firms are presented in Tables 4.22 and 4.23. Group I firms had the highest means for the two assets categories. There was, however, no specific ordering in the level of asset means, by profitability group, in the data set. The non-focus firm's asset means were lower in all profitability group categories than were the focus firm's means.

The range in the proportion of fixed assets to local assets was greater among more of the profitability groups of non-focus firms than of focus firms. The proportion for non-focus Group I firms ranged from twenty-seven to fifty-five percent. The ratio of Group II non-focus firms paralleled Group II focus firms i.e. between thirty-nine and fifty percent. The proportion of Group III firm's fixed asset to local assets was between thirty-two and forty-nine percent. And the proportion's range for Group IV firms was thirty-eight to nearly fifty percent. The variation in the range of this ratio between focus and non-focus Group I firms demonstrated

Table 4.22 Profitability group local asset means of non-focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	2,135 (2)	1,628 (31)	1,821 (29)	1,000 (7)
1986	3,142 (4)	1,695 (32)	1,287 (15)	1,847 (2)
1987	2,416 (9)	1,647 (28)	a (1)	0 (0)
1988	3,996 (4)	2,123 (23)	1,489 (2)	a (1)
1989	5,612 (2)	1,828 (13)	2,296 (7)	a (1)
1990	a (1)	1,668 (6)	2,851 (6)	1,422 (2)

a) Omitted to prevent disclosure.

Table 4.23 Profitability group fixed asset means of non-focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	960 (2)	701 (31)	959 (29)	375 (7)
1986	1,780 (4)	814 (32)	628 (15)	737 (2)
1987	972 (9)	803 (28)	a (1)	0 (0)
1988	1,144 (4)	901 (23)	486 (2)	a (1)
1989	1,567 (2)	749 (13)	810 (7)	a (1)
1990	a (1)	644 (6)	1,035 (6)	578 (2)

a) Omitted to prevent disclosure.

that the most profitable firms, Group I focus firms, had a more consistent asset mix in their operations.

The profitability group local equity means for focus and non-focus firms are presented in Tables 4.24 and 4.25. The focus firm's equity base, as measured by its profitability

Table 4.24 Profitability group local equity means of focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	2,238 (15)	1,699 (88)	1,067 (41)	733 (6)
1986	1,848 (34)	1,662 (93)	950 (22)	0 (0)
1987	2,035 (58)	1,672 (87)	1,042 (4)	0 (0)
1988	2,242 (59)	1,849 (85)	815 (7)	0 (0)
1989	2,635 (38)	2,031 (82)	1,334 (24)	1,090 (6)
1990	2,917 (23)	2,247 (98)	1,194 (30)	a (1)
1991	4,199 (17)	2,276 (91)	1,401 (39)	569 (5)

a) Omitted to prevent disclosure.

Table 4.25 Profitability group local equity means of non-focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	817 (2)	849 (31)	798 (29)	288 (7)
1986	1,152 (4)	970 (32)	676 (15)	135 (2)
1987	1,090 (9)	1,021 (28)	a (1)	0 (0)
1988	2,047 (4)	1,099 (23)	522 (2)	a (1)
1989	3,397 (2)	1,024 (13)	865 (7)	a (1)
1990	a (1)	981 (6)	1,021 (6)	752 (2)

a) Omitted to prevent disclosure.

group means, exceeded that of the non-focus firms for nearly all observations. The exceptions were based on a small sample of non-focus Group I firms in 1989 and 1990. The local equity means of some focus firm group classifications doubled the mean of non-focus firm classifications in many years,

especially among the Group II firms.

Group I and II focus firms had relatively strong equity positions throughout the study. These group's means stayed fairly consistent early during the period (1985-1987) then increased by ninety and thirty-three percent, respectively, of their 1985 levels by the end of the period. Group III and IV's equity positions, while stronger than their counterparts among non-focus firms, were for most years substantially weaker than the first two profitability groups. This was true of other measures for scale such as sales and asset levels. These measures also revealed that smaller firms, based on their profitability group classification, generally realized lower returns on their owner's investments.

With the exception of their Group I cooperatives in 1988 to 1990, the non-focus firm's equity positions, as measured by each group's local equity mean, was substantially lower than their focus firm counterparts. This was especially true for the Group III and IV non-focus firms. Although the firms in these groups operated on smaller scales, it appeared that they were under-financed with equity capital. It is likely that equity had been eroding due to operating losses and reached a critical point. This situation could be crippling to a cooperative during times of unfavorable economic conditions.

Tables 4.26 and 4.27 present the profitability group net local margins means. Both focus and non-focus Group I firms

Table 4.26 Net margin means of focus firms by CROA profitability group in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	349 (15)	111 (88)	-139 (41)	-432 (6)
1986	400 (34)	179 (93)	-98 (22)	0 (0)
1987	506 (58)	230 (87)	-98 (4)	0 (0)
1988	497 (59)	213 (85)	-49 (7)	0 (0)
1989	530 (38)	178 (82)	-139 (24)	-593 (6)
1990	530 (23)	199 (98)	-92 (30)	a (1)
1991	661 (17)	164 (91)	-108 (39)	-263 (5)

a) Omitted to prevent disclosure.

Table 4.27 Net margin means of non-focus firms by CROA profitability group in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	210 (2)	63 (31)	-93 (29)	-146 (7)
1986	394 (4)	93 (32)	-40 (15)	-412 (2)
1987	274 (9)	112 (28)	a (1)	0 (0)
1988	410 (4)	109 (23)	-73 (2)	a (1)
1989	681 (2)	61 (13)	-91 (7)	a (1)
1990	a (1)	99 (6)	-109 (6)	-141 (2)

a) Omitted to prevent disclosure.

had margin levels up to four times those calculated for their respective data set's Group II firms. The high margin means of these Group I firm's were realized even in the years when the industry averages were quite low (i.e. 1985 and 1991). The ability of these focus Group I firms to consistently

outperform the industry average, indicated superior rates of return to their owner's investment unmatched by the other cooperatives in the sample.

The Group II focus firms outperformed the industry average in years when industry margins were low, but had lower margin levels in years when the industry average was higher (see Table 4.2). These firm's margins were consistently twice the size of their non-focus firm counterparts, who in all years of the study had mean margin levels below the industry average.

By definition of the model of cooperative profitability, all Group III and Group IV firms had negative local margins. For both focus and non-focus Group III firms the losses, as measured by the margin's mean, were lessened during periods of brisk economic activity, i.e. 1986-1989. On the other hand, Group IV firms in both data sets posted substantial losses across the entire period.

The interest means by profitability group for the focus and non-focus firm data sets are summarized in Tables 4.28 and 4.29. Although not all firms carried term debt, nearly all cooperatives (numbers shown in parentheses) comprising the samples had interest expense over the period. All of the non-focus firms had interest expense and essentially all of the Groups I, III, and IV focus firms had this expense. Group II focus firms had the greatest number of firms with no interest

Table 4.28 Profitability group means for interest expense of focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	135 (15)	111 (88)	147 (41)	176 (6)
1986	116 (34)	70 (91)	129 (21)	0 (0)
1987	85 (58)	47 (81)	103 (4)	0 (0)
1988	108 (58)	71 (82)	103 (7)	0 (0)
1989	105 (37)	106 (78)	127 (24)	247 (6)
1990	122 (22)	106 (95)	140 (30)	a (1)
1991	205 (16)	86 (86)	131 (39)	76 (5)

a) Omitted to prevent disclosure.

Table 4.29 Profitability group means of interest expense for non-focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	53 (2)	67 (31)	117 (29)	53 (7)
1986	160 (4)	57 (32)	59 (15)	197 (2)
1987	67 (9)	41 (28)	a (1)	0 (0)
1988	69 (4)	59 (22)	47 (2)	a (1)
1989	268 (2)	50 (13)	96 (7)	a (1)
1990	a (1)	51 (6)	105 (6)	45 (2)

a) Omitted to prevent disclosure.

payments.

The interest means of focus firms for all profitability group classifications were generally higher than non-focus firm's means. This result was not surprising given the higher levels of debt (both current and term) carried by the focus

firms. The reduction of term debt, without substantial increases in current debt, by the majority of non-focus firms in the latter years of the study also contributed to this finding.

Although Group I focus firms had on average high interest payments, this expense was not sufficient to raise the cash flow rate of return on assets above the rate of return on owner's equity. This group's interest mean reflected its employment of increased levels of term debt as economic conditions improved and borrowing costs diminished. In addition the increased use of short-term debt financing, with its shorter terms and lower borrowing costs helped keep their interest payments from reducing ROE below their CROA.

The focus and non-focus firm's depreciation expense means are presented in Tables 4.30 and 4.31. The total value of focus firm's depreciation expense mean exceeded that of the non-focus firm's mean across all profitability group classifications consistently throughout the period of the study. The larger level of fixed assets employed by focus firms in the four groups accounted for this finding. The primary difference between the two data sets and within group classifications was found in the depreciation rate that can be derived from ratio of the depreciation expense mean to the fixed asset mean (demonstrated in long-run profitability group analysis).

Table 4.30 Profitability group depreciation expense means for focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	186 (15)	182 (88)	176 (41)	136 (6)
1986	213 (34)	174 (93)	155 (22)	0 (0)
1987	224 (58)	163 (87)	226 (4)	0 (0)
1988	211 (59)	186 (85)	150 (7)	0 (0)
1989	223 (38)	194 (82)	183 (24)	238 (6)
1990	259 (23)	211 (98)	166 (30)	a (1)
1991	419 (17)	208 (91)	197 (39)	101 (5)

a) Omitted to prevent disclosure.

Table 4.31 Profitability group depreciation expense means for non-focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	90 (2)	83 (31)	119 (29)	40 (7)
1986	143 (4)	103 (32)	87 (15)	144 (2)
1987	108 (9)	96 (28)	a (1)	0 (0)
1988	125 (4)	107 (23)	75 (2)	a (1)
1989	189 (2)	93 (13)	118 (7)	a (1)
1990	a (1)	101 (6)	131 (6)	66 (2)

a) Omitted to prevent disclosure.

Group I non-focus firms depreciated fixed assets at a rate that approached, in some years, five percentage points under the rate of their focus firm counterparts. Group I focus firms, on average, depreciated fixed assets at a rate that varied between 11.8 and 13 percent which was

approximately the sample firm's depreciation mean in most years of the study. The lower depreciation mean found among the Group I non-focus firms indicated a slower replacement rate of these firms fixed assets.

Group III and IV firms of both data sets depreciated fixed assets at higher rates than did Groups I and II in most years of the study, with the exception of the Group IV non-focus firms in 1989 and 1990. Group III's 1987 depreciation means for both groups were above twenty percent of their respective fixed asset's mean. And during the industry's most profitable years, Group III focus firm's depreciation mean exceeded fifteen percent of fixed assets.

3. Long-run profitability group classifications and variable profiles

As previously described in section B.3 of Chapter III, a long-run profitability group classification analysis was done on the focus firm data set. Financial variable and ratio means and standard deviations were calculated for the three profitability groups that were represented in the analysis as well as for the complete data set. The long-run analysis, using the CROA criteria, produced no Group IV cooperative classifications. Any such firms would have had, on average, negative earnings in all the sample years with negative measures of CROA and ROE. It was highly unlikely that a cooperative could remain viable under these conditions.

Table 4.32 presents the first of three tables summarizing the results of the long-run analysis. The financial variable means are presented in thousands of dollars. The focus firm means provided a standard measure of firm performance over the seven year period. The results can be interpreted as yearly averages for financial statement variables and financial ratios of a representative cooperative in the data set. Likewise, the profitability group means represented yearly averages over the period for a cooperative's particular classification. Group means that differed significantly among the profitability group classifications are identified next to the group's variable mean. The Scheffe procedure was used to make comparisons among the group means. The group number in parentheses indicates the profitability group comparisons that had significant differences in their variable (and ratio) means.

Over seventy-five percent of the focus firms had profitability Group II long-run classifications. Of the three long-run profitability groups Group II firms had, based on yearly sales, local and total asset means, the smallest scale of operations. Yearly average sales of these firms over the period ranged from just over $1.13 million to $50 million. This long-run group's firms employed higher levels of local equity and fixed assets than Group III firms, who based on sales, local and total asset means had larger scale of

Table 4.32 Long-run CROA profitability group classification financial variable means in percentages (std. dev.)a

Category	Sample	Group I	Group II	Group III
N	150	21	114	15
Sales	12,494 (15,089)	25,811(2,3) (33,236)	10,018 (7,508)	12,668 (8,612)
Term Debt	321 (463)	596(2) (842)	247(3) (331)	493 (444)
Local Equity	1,907 (1,859)	3,261(2,3) (3,826)	1,747 (1,216)	1,234 (698)
Total Assets	4,659 (4,918)	9,045(2,3) (10,458)	3,822 (2,706)	4,878 (2,730)
Local Assets	3,816 (4,312)	7,866(2,3) (9,223)	3,102 (2,305)	3,568 (2,153)
Fixed Assets	1,505 (1,634)	2,689(2,3) (3,316)	1,326 (1,095)	1,209 (761)

a) Parentheses indicate group means significantly different at a 95% confidence level.

operations.

Long-run profitability Group I firms were comprised largely of the biggest firms in the sample. Their size, based on yearly sales average, ranged from $6.6 million to over $57 million. Based on sales and asset means, Group I firms were on average twice to two-and-a-half times larger than firms in either of the other two profitability group classifications.

The remaining long-run profitability group financial variable means are presented in Table 4.33. The means included income and flow of funds statement variables.

Group I cooperatives were clearly the most profitable

Table 4.33 Long-run CROA profitability group classification financial variable means in percentages (std. dev.)a

Category	Sample	Group I	Group II	Group III
N	150	21	114	15
Margins	200 (324)	561 (2,3) (607)	171 (3) (191)	-86 (76)
Interest	97 (132)	192 (2) (264)	73 (80)	150 (111)
Depreciation	197 (206)	350 (2,3) (440)	167 (124)	205 (105)
Term Loans	77 (144)	202 (2) (331)	49 (58)	116 (67)
Cash Refunds	55 (97)	167 (2,3) (205)	40 (46)	14 (11)
Equity Retired	69 (102)	130 (2,3) (191)	63 (79)	28 (25)
FxAsset Purchase	232 (313)	540 (2,3) (704)	178 (139)	205 (99)

a) Parentheses indicate group means significantly different at a 95% confidence level.

of the three groups. Group I's net local margins (margins) were over three times greater than Group II's margin mean. The fifteen Group III cooperatives, on average, posted yearly losses throughout the period.

While Group I's margin mean was over three times Group II's mean, the Group I firms had cash refunds over four times the amount of Group II indicating a higher average percentage of yearly cash patronage. High cash refunds serve as a positive incentive for member participation in the

cooperative. Group III firms made some cash refunds, but these were paid out of their income from investments in other cooperatives, not their local margins. In many cases they come from not reinvesting depreciation cash flow rather than current income.

Group I had the highest interest and depreciation expense means as well as mean term loans of the three profitability groups. This result is not surprising considering the size differences between Group I and the two other groups. However, the interest expense mean for Group I firms relative to the debt they employed indicated a lower cost of debt when compared Group's II and III. As will be seen later this is in part due to a greater reliance on short-term debt. Group I firms use larger amounts of term debt on an annual basis but it is a smaller fraction of their total debt.

Group I firms retired twice the amount of equity anually as Group II firms and nearly five times the amount of Group III firms. In view of the relative equity positions of the three Groups, this indicated that Group I firms had a shorter equity revolvement period than did the firms in the other two groups. Also, Group I firms purchased new fixed assets at a yearly rate of two-and-a-half to three times the rate for Groups II or III.

The financial ratio means calculated for the long-run profitability group classifications are presented in

Table 4.34 Long-run CROA profitability group classification financial ratio means in percentages (std. dev.)a

Category	Sample	Group I	Group II	Group III
N	150	21	114	15
CROA	13.39 (4.06)	16.10(3) (4.03)	13.57(3) (3.64)	8.26 (2.27)
ROE	8.54 (8.57)	19.37(2,3) (5.88)	8.77(3) (4.73)	-8.38 (8.25)
D/A	43.78 (17.06)	54.97(2) (12.80)	39.43(3) (15.21)	61.18 (18.21)
Term /TotDbt.	18.05 (11.87)	14.87 (10.42)	18.17 (12.16)	21.59 (11.08)
Interest /TotDbt.	5.48 (2.75)	4.19(3) (1.68)	5.53 (2.93)	6.93 (1.48)
Deprec. /FAssets	14.59 (4.26)	14.71(3) (4.40)	14.08(3) (3.98)	18.29 (4.58)
FAsset /TotAst.	31.63 (8.99)	27.68(3) (9.17)	33.16(3) (8.63)	25.55 (7.53)
LAsset /TotAst.	79.65 (7.37)	84.19(3) (6.92)	79.76(3) (6.90)	72.48 (6.25)
Retired /LEquity	3.00 (1.91)	3.56 (2.13)	3.00 (1.91)	2.27 (1.30)
FAPurch /Deprec.	115.55 (39.09)	151.07(2,3) (42.59)	110.44 (36.93)	104.61 (20.86)

a) Parentheses indicate group means significantly different at a 95% confidence level.

Table 4.34. The long-run analysis calculated similar ratios used in previous profitability group analysis as well as additional ratios constructed from financial variables. It was believed that these additional ratios could provide valuable information on cooperatives' asset and flow of funds structure.

The profitability group means for the three financial ratios that were calculated for the study were considerably different among Groups I, II, and III cooperatives. The CROA measures for Group I and II firms were both relatively high, and Group I had nearly twice the CROA mean as Group III firms. Group I's average return on owner's investment was twice the magnitude of Group II's while, due to a negative yearly average for net local margins, Group III's ROE was negative throughout the period.

The debt-asset mean of the groups diverged considerably as well. Group II firms employed the lowest percentage of debt with over sixty percent of their local assets equity funded. Group III firms had a much higher D/A ratio, funding local assets with less than thirty-nine percent of equity. And Group I's local assets were funded with nearly forty-five percent local equity.

The degree cooperatives depended on long-term funds was captured in the term debt to total debt ratio. Of the three profitability groups, Group I firms employed the least amount of term debt and Group III firms the most. The extent to which a cooperative employs term-debt is fundamental to its cost of debt capital. Firms that employed high levels of term debt generally had higher interest expenses.

The long-run profitability group analysis also produced differences in financial statement variables and ratios among

the three profitability groups. In addition to differences in scale the relationships between the financial variable and ratio means allowed further discrimination in firm characteristics among the groups. Several other Group I financial characteristics separated this profitability group from the others.

As shown in Table 4.33 Group I were the most profitable of all focus firms. Their local net margins were nearly four times those of Group II. Group III firms, on average, had negative net local margins. Any earnings these firms realized were in the form of patronage refunds from investments in other cooperatives. Over twenty-seven percent of these firm's total assets were investments in other cooperatives, whereas Group I firms had less than sixteen percent of their total assets as equity in other cooperatives and Group II firms had a little over twenty percent of their total assets invested as such.

Although Group I had the highest interest expense mean, it accounted for just a little over four-percent of these firm's total debt. Their term debt to total debt ratio of 14.87 percent indicated that these firms depended on short-term borrowing to a much greater degree than the firms in other groups. The lower borrowing costs of these funds were partly responsible for Group I's relatively low interest expense mean and low interest expense to total debt ratio.

Group III firms, on the other hand, incurred higher borrowing costs as a result of their greater dependence on long-term debt and possibly adverse interest rate classifications by the lender.

The depreciation rate of Group I firms, measured by depreciation expense to fixed assets, was nearly fifteen percent per year. Group II firms depreciated fixed assets at a slightly lesser rate of fourteen-percent per year while Group III's rate was over eighteen-percent per year. Not replacing fixed assets over the period may have accounted for Group III's higher average depreciation rate.

Group I had the highest percentage of total assets in the form of locally controlled assets while Group III had the lowest. As a percentage of total assets, Groups I and III's fixed assets were approximately the same. Group II had a higher percentage of their total assets as fixed assets.

Of the three profitability groups Group I firms retired the highest percentage of local equity per year. The $130,000 of equity the average Group I firm retired each year represented over three-and-a-half percent of its local equity, which translated into an estimated revolvement period of approximately twenty-eight years. Based on the percent of local equity retired each year, Group II's revolvement period was estimated to be nearly thirty-three years and Group III's was estimated to be over forty-four years in length. The

Group I firms, however, had the capacity to increase this rate without taking cash flow from fixed asset replacement.

One of the most discriminating differences between the profitability groups was found in the mean for fixed assets purchased. Clearly Group I's purchases exceeded the other Groups in dollar amounts (Table 4.33) but what is really of interest here is the percentage of fixed assets purchased to the Group's depreciation expense mean. Group I firms were not only replacing their depreciated assets but were also, on average, expanding their fixed asset base by fifty-one percent of the depreciation expense each year. While the decision was made to expand, these cooperatives could have elected to retire equity at a faster pace and still maintained their fixed asset base. The fixed assets purchased by the other two groups were just sufficient to replace their depreciated assets. Faster equity retirement would require a reduction in fixed asset base.

CHAPTER V. SUMMARY AND CONCLUSIONS

A. Discussion of Research Results

A chief objective of this study was to measure the performance of local grain marketing and input supply cooperatives. The main interest behind measuring cooperative performance was to isolate and identify firms that consistently outperformed industry averages for the sample. The relationship between cooperative capital structure and firm profitability was used as an approach to performance measurement. A model of cooperative profitability was applied to the sample to classify firms based on their rate of return on assets and owner's investment. Although owners do not receive direct payments based on investment as corporate investors, the benefits of the cooperative to members hinge on effective use of equity. From the model, cooperative performance groups were separated and financial variable and ratio means were calculated for the groups. The following summarizes the results of the study and comments on its implications for cooperative growth.

Over the period of the study the sample size decreased from 219 cooperatives in 1985 to 152 in 1991, a loss of 69 firms. A result of these losses was that by 1991 the average cooperative had grown considerably. Average sales were up over seventy-five percent from 1985. Local assets had

increased by ninety percent and fixed assets increased by sixty percent. By 1991, the average equity capital employed by the sample firms had increased seventy percent.

Although the average sample cooperative had greatly increased its size and scale of operations over the period, in 1991 it employed only a slightly higher level of long-term debt than in 1985. And its debt-asset ratio was actually a percent-and-a-quarter lower in 1991 than in 1985. Clearly, a larger portion of cooperative's operations involved greater inventory hedging that was short-term financed.

Because the focus firms were essentially the same throughout the period and on average larger than sample firms, the group's financial variable means captured some of the strengths in the financial statements of solvent cooperatives. These firms, on average, realized nearly a fifty percent increase in sales over the period. Local assets of the firms increased by over sixty-five percent while fixed assets increased by thirty-three percent. Although focus firms had improved their equity position by nearly fifty percent by the end of the study, debt still accounted for over forty-seven percent of capital financing. And short-term debt represented a larger proportion of this debt than in 1985.

Of the firms that eventually discontinued operations, profitability appeared to be the non-focus firms major problem. During the most profitable years in the study, these

firms net local margins were still substantially below the sample's average. Low margins coupled with relatively high debt costs were sufficient to eventually force these firms out of business. In the earlier years of the study, the smaller non-focus firms were initially the first to discontinue operations. Improved margins and interest expense allowed many of the larger non-focus firms to continue operating in 1987 and 1988. The but then as margins declined and interest costs rose in 1989 and 1990, even these firms were eventually driven out of the industry.

The profitability group analysis of the firms who stayed solvent (focus firms) and those who dropped out of the sample (non-focus firms) provided insight into firm characteristics of the more successful cooperatives. In particular, the annual means of Group I focus firms demonstrated superior rates of return on owner's investment. By definition, Group I firms had measures of ROE that exceeded their CROA measure. Even though their CROA measures were respectable in all years of the study, these firms posted very impressive measures of ROE, much higher than the sample's average.

Group I focus firms consistently had debt-asset ratios exceeding fifty percent. Although a relatively high percentage of that debt was in long-term obligations early in the period, it still had an enhancing effect on the return on owner's investment. And as these firms employed more short-

term debt to replace long-term debt later in the period, they continued to post very respectable ROEs.

The most obvious characteristic of the Group I firms was their size as measured by sales, local and fixed assets and equity means. In all years of the study, Group I firms were one-and-a-half to two times as large as the size of an average sample firm for these categories. In 1991, Group I firms doubled the sample's average for all the size categories. Given the fairly consistent mix of fixed and local assets, especially in the last four years, the apparent scale of operation advantages these firms possessed provided high returns on equity and growth opportunity.

Another characteristic of Group I firms was their ability to generate high margins. Clearly the firms were the most profitable out of the sample. Their local net margin mean far surpassed the sample's average over the period. This was not unexpected considering that larger cooperative's generally comprised the group. However, in years that were not necessarily favorable for the industry as a whole (1985, 1990, and 1991), the firms classified in Group I remained quite profitable. This seems to indicate that they were effective competitors in adverse periods as well as better periods.

Though all Group I firms employed some level of debt (over seventy percent carried term debt) throughout the study, their interest costs on this debt was not a significant enough

burden to negatively affect the rate of return on owner's equity. It is likely that their scale of operations and performance record positioned them to negotiate more favorable lending terms than other sample firms. Employing relatively more short-term rather than long-term debt also gave the firms a debt cost advantage over firms who depended more heavily on term-debt financing. This fact was highlighted by long-run Group I firm's interest expense to debt ratio.

The long-run profitability group analysis revealed several discriminating firm characteristics of the twenty firms who were classified in Group I over the entire period.

Long-run Group I firm's local assets accounted for more than eighty-four percent of their total assets, the highest percentage among all the profitability groups. Local assets were defined as those assets under the direct control of a cooperative's management and members. A high degree of local control over a firm's assets provides greater flexibility in deciding where and how those assets are employed. Group I firm's ability to allocate a larger share of their resources (assets) into profitable ventures provided them with greater opportunities to capture greater profits.

Group I's cash patronage refunds were on average high compared with Group I and II's refunds. High cash refunds can serve as an immediate incentive for member-patrons to increase their business and investment in a local cooperative. Even

with Group I's high cash refunds, equity growth was achieved. Equity growth combined with sufficiently good yearly margins created the essential preconditions for Group I firms to grow.

As shown in the focus firm's profitability group tables for depreciation expense and fixed asset means, and in the long-run table for the same means, Group I firms depreciated their fixed assets at a rate of approximately fifteen percent a year. Although their fixed asset base was continually growing, on average, the fixed assets purchased per year exceeded twenty percent of Group I's fixed asset total. In other words, the firms not only replaced depreciated assets but increased those assets, on average, by nearly fifty-five percent ($190,000) of their depreciation expense each year. As a percentage, fixed assets constituted close to twenty-eight percent of Group I firms total assets. This long-run ratio was in the range of Group I's yearly profitability group fixed asset to total asset ratio.

In addition to providing substantial rates of return on owner's investment and experiencing organizational growth, the long-run Group I firms, on average, were redeeming equity at a moderate rate. Their equity revolvement period, estimated to be twenty-eight years in length, was the shortest among the long-run profitability groups. It appeared, over the seven years of the study, that Group I firms opted for a longer revolvement period in favor of increased cooperative growth.

It would have been possible for these firms to have reduced their fixed asset purchases in favor of a shorter revolvement period. Nonetheless, these long-run Group I firms were rotating equity at an acceptable rate and have the capability to increase the rate about double the current rate and still replace fixed assets.

B. Conclusions

The model of cooperative profitability proved to be useful in separating firms that had relatively high debt levels but provided respectable rates of return on owner's investment from firms whose debt levels negatively affected owner's rate of return on investment. This discriminating ability of the model allowed identification of the financial characteristics of cooperatives that provided the greatest returns to their owner-members.

Owner-members generally support their local cooperative for reasons other than direct return on equity (e.g. to ensure that they'll have an outlet for marketing products and purchasing farm input supplies). But they must also be concerned with cooperative's effective use of equity as measured by the return on their investment. While financial returns are based on patronage the firm must use equity capital effectively to provide acceptable patronage refunds and revolvement. Ultimately farmer members lose value when

their cooperative uses equity capital ineffectively. Cooperative Boards of Directors are responsible to members for competently maintaining the profitability and the effective use of capital to ensure viability of the organization.

The results of this study provide useful information to a cooperative Board when analyzing financial characteristics of its firm. Because the firms represented in the sample were grain marketing and supply cooperatives, the study's results are most applicable to similar operations. However, the approach and model used are more widely applicable. With more information on a cooperative's business mix, i.e. percent of marketing and supply business, a more detailed profitability group analysis would be possible. Then, specific categories could be included for firm activity type that would possibly improve the discriminating ability of the model and better identify financial performance characteristics of profitable and growing organizations.

C. Implications for Cooperative Decisionmakers

The analysis has numerous implications for cooperative decision makers. Three are especially important.

First, larger cooperative organizations appear to be most successful in generating a large enough ROE to be effective in maintaining fixed assets while having the capacity to retire equity. Although size does not appear to guarantee success,

it was clear that cooperatives with ROE greater than CROA tended to be larger. This would imply that there is a benefit to reaching some minimal size. It also implies that cooperative directors and members should make a conscious decision to achieve that size if they wish to retire equity while maintaining their fixed asset base.

Second, a large fraction of cooperatives (over two-thirds) were capable of reaching the point where ROE was greater than ROA but not CROA. These cooperatives will likely face a decision of whether to maintain fixed assets or revolve retained equity. Unless returns can be increased with assets they currently own or the cost of debt can be adjusted to increase their return on equity, these firms are unlikely to experience any substantial growth and return equity at the same time.

Third the implied promise of equity retirement at a specific age may not be met for many cooperative patrons. Group II and Group III cooperatives in the long-run analysis are likely to find revolving periods getting longer and an increasing amount of equity being retired via estates rather than through policy. The increasing number of members reaching the age of retirement and the smaller number of entering members combined with the low return on equity is likely to create stress in these cooperatives as they move forward.

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APPENDIX A: SAMPLE FIRMS PROFITABILITY GROUP PROFILES

Table A.1 CROA profitability group sales means of sample firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	18,356 (17)	8,473 (119)	7,997 (70)	5,569 (13)
1986	14,214 (38)	6,797 (125)	6,196 (37)	8,233 (2)
1987	12,922 (67)	6,225 (115)	8,036 (5)	0 (0)
1988	15,149 (63)	9,912 (108)	7,984 (9)	a (1)
1989	20,120 (40)	12,998 (95)	11,367 (31)	15,338 (7)
1990	23,291 (24)	13,935 (104)	11,422 (36)	5,774 (3)
1991	36,163 (17)	13,084 (91)	13,054 (39)	6,341 (5)

a) Omitted to prevent disclosure.

Table A.2 CROA profitability group term debt means of sample firms in thousands of dollars (firms reporting debt)

Year	Group I	Group II	Group III	Group IV
1985	568 (14)	442 (99)	482 (68)	267 (11)
1986	550 (36)	363 (107)	382 (31)	a (1)
1987	466 (57)	283 (86)	569 (5)	0 (0)
1988	464 (52)	259 (80)	431 (8)	a (1)
1989	386 (27)	280 (67)	375 (25)	418 (6)
1990	486 (16)	308 (72)	552 (29)	114 (2)
1991	768 (12)	348 (64)	620 (33)	498 (3)

a) Omitted to prevent disclosure.

Table A.3 CROA profitability group local asset means of sample firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	4,514 (17)	2,645 (119)	3,096 (70)	1,684 (13)
1986	3,933 (38)	2,380 (125)	1,851 (37)	1,847 (2)
1987	4,112 (67)	2,313 (115)	2,275 (5)	0 (0)
1988	5,099 (63)	3,095 (108)	2,408 (9)	a (1)
1989	5,351 (40)	3,481 (95)	2,857 (31)	4,008 (7)
1990	6,460 (24)	4,129 (104)	3,492 (36)	2,009 (3)
1991	10,715 (17)	4,340 (91)	4,300 (39)	2,707 (5)

a) Omitted to prevent disclosure.

Table A.4 CROA profitability group fixed asset means of sample firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	1,370 (17)	1,227 (119)	1,108 (70)	666 (13)
1986	1,646 (38)	1,233 (125)	826 (37)	737 (2)
1987	1,649 (67)	1,133 (115)	908 (5)	0 (0)
1988	1,730 (63)	1,230 (108)	733 (9)	a (1)
1989	1,865 (40)	1,368 (95)	1,140 (31)	1,411 (7)
1990	2,166 (24)	1,585 (104)	1,199 (36)	704 (3)
1991	3,318 (17)	1,672 (91)	1,464 (39)	663 (5)

a) Omitted to prevent disclosure.

Table A.5 CROA profitability group net local margins of sample firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	333 (17)	98 (119)	-120 (70)	-278 (13)
1986	400 (38)	157 (125)	-74 (37)	-412 (2)
1987	475 (67)	202 (115)	-92 (5)	0 (0)
1988	491 (63)	191 (108)	-54 (9)	a (1)
1989	537 (40)	162 (95)	-128 (31)	-551 (7)
1990	530 (24)	194 (104)	-94 (36)	-212 (3)
1991	661 (17)	164 (91)	-108 (39)	-263 (5)

a) Omitted to prevent disclosure.

Table A.6 CROA profitability group interest expense means sample firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	125 (17)	100 (119)	135 (70)	110 (13)
1986	121 (38)	67 (123)	100 (36)	197 (2)
1987	83 (67)	46 (109)	116 (5)	0 (0)
1988	105 (62)	68 (104)	91 (9)	a (1)
1989	113 (39)	98 (91)	121 (30)	226 (7)
1990	121 (23)	103 (101)	134 (36)	72 (3)
1991	205 (16)	86 (86)	131 (39)	76 (5)

a) Omitted to prevent disclosure.

Table A.7 CROA profitability group depreciation expense means of sample firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	175 (17)	156 (119)	153 (70)	84 (13)
1986	206 (38)	156 (125)	128 (37)	144 (2)
1987	208 (67)	147 (115)	212 (5)	0 (0)
1988	206 (63)	170 (108)	134 (9)	a (1)
1989	222 (40)	180 (95)	169 (31)	222 (7)
1990	257 (24)	205 (104)	160 (36)	101 (3)
1991	419 (17)	208 (91)	197 (39)	101 (5)

a) Omitted to prevent disclosure.

Table A.8 CROA profitability group local equity means of sample firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	2,071 (17)	1,477 (119)	956 (70)	494 (13)
1986	1,775 (38)	1,408 (125)	839 (37)	506 (2)
1987	1,908 (67)	1,514 (115)	844 (5)	0 (0)
1988	2,230 (63)	1,689 (108)	750 (9)	a (1)
1989	2,673 (40)	1,894 (95)	1,228 (31)	1,275 (7)
1990	3,003 (24)	2,174 (104)	1,165 (36)	755 (3)
1991	4,199 (17)	2,276 (91)	1,401 (39)	569 (5)

a) Omitted to prevent disclosure.

Table A.9 CROA profitability group debt-asset ratio means of sample firms (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	54.29 (17)	42.64 (119)	54.57 (70)	62.24 (13)
1986	56.90 (38)	37.68 (125)	50.08 (37)	83.51 (2)
1987	50.91 (67)	32.48 (115)	62.17 (5)	0 (0)
1988	51.23 (63)	36.68 (108)	59.10 (9)	a (1)
1989	50.22 (40)	37.70 (95)	51.64 (31)	67.33 (7)
1990	50.68 (24)	38.35 (104)	57.46 (36)	47.84 (3)
1991	55.04 (17)	40.18 (91)	58.92 (39)	56.02 (5)

a) Omitted to prevent disclosure.

Table A.10 CROA profitability group CROA means of sample firms (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	16.99 (17)	13.03 (119)	7.03 (70)	-6.68 (13)
1986	19.54 (38)	15.50 (125)	6.73 (37)	-3.77 (2)
1987	20.57 (67)	16.42 (115)	9.76 (5)	0 (0)
1988	17.92 (63)	14.66 (108)	7.34 (9)	a (1)
1989	16.53 (40)	12.66 (95)	5.06 (31)	-2.60 (7)
1990	14.61 (24)	13.07 (104)	5.35 (36)	-3.89 (3)
1991	13.13 (17)	11.44 (91)	4.99 (39)	-6.01 (5)

a) Omitted to prevent disclosure.

Table A.11 CROA profitability group ROE means of sample firms (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	21.28 (17)	6.71 (119)	-14.57 (70)	-54.88 (13)
1986	27.15 (38)	10.26 (125)	-9.35 (37)	-138.93 (2)
1987	27.72 (67)	11.82 (115)	-28.64 (5)	0 (0)
1988	22.95 (63)	10.24 (108)	-8.19 (9)	a (1)
1989	19.93 (40)	8.03 (95)	-12.27 (31)	-35.17 (7)
1990	18.12 (24)	8.10 (104)	-15.16 (36)	-25.30 (3)
1991	16.18 (17)	7.10 (91)	-11.64 (39)	-40.84 (5)

a) Omitted to prevent disclosure.

APPENDIX B: FOCUS FIRM ROA PROFITABILITY GROUP PROFILES

Table B.1 ROA profitability group sales means of focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	14,126 (46)	8,786 (57)	9,848 (20)	8,610 (27)
1986	9,911 (103)	7,345 (24)	7,739 (14)	7,751 (8)
1987	9,859 (135)	5,983 (10)	a (1)	8,661 (3)
1988	13,042 (133)	8,285 (11)	11,236 (5)	3,562 (2)
1989	16,559 (97)	12,168 (23)	11,256 (7)	12,878 (23)
1990	17,096 (85)	13,182 (36)	15,635 (17)	7,483 (14)
1991	16,971 (80)	15,991 (28)	17,801 (17)	8,822 (27)

a) Omitted to prevent disclosure.

Table B.2 ROA profitability group term debt means of focus firms in thousands of dollars (firms reporting debt)

Year	Group I	Group II	Group III	Group IV
1985	503 (39)	554 (56)	755 (19)	456 (26)
1986	433 (90)	403 (22)	537 (13)	309 (7)
1987	386 (107)	258 (7)	a (1)	363 (3)
1988	370 (105)	318 (6)	593 (5)	a (1)
1989	359 (65)	261 (18)	447 (7)	479 (19)
1990	332 (56)	382 (29)	534 (17)	780 (7)
1991	319 (52)	621 (24)	885 (16)	389 (20)

a) Omitted to prevent disclosure.

Table B.3 ROA profitability group local asset means of focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	4,081 (46)	2,614 (57)	2,670 (20)	2,437 (27)
1986	3,150 (103)	2,318 (24)	2,311 (14)	2,103 (8)
1987	3,378 (135)	1,767 (10)	a (1)	2,618 (3)
1988	4,242 (133)	2,411 (11)	3,351 (5)	9,701 (2)
1989	4,536 (97)	3,032 (23)	2,926 (7)	3,687 (23)
1990	5,030 (85)	3,868 (36)	4,551 (17)	2,459 (14)
1991	5,415 (80)	5,139 (28)	5,488 (17)	3,256 (27)

a) Omitted to prevent disclosure.

Table B.4 ROA profitability group fixed asset means of focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	1,480 (46)	1,335 (57)	1,404 (20)	1,173 (27)
1986	1,478 (103)	1,301 (24)	1,016 (14)	864 (8)
1987	1,500 (135)	702 (10)	a (1)	3,605 (3)
1988	1,549 (133)	961 (11)	1,011 (5)	285 (2)
1989	1,659 (97)	1,337 (23)	1,399 (7)	1,235 (23)
1990	1,792 (85)	1,616 (36)	1,506 (17)	880 (14)
1991	1,905 (80)	2,005 (28)	1,834 (17)	1,082 (27)

a) Omitted to prevent disclosure.

Table B.5 ROA profitability group net local margins of focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	256 (46)	57 (57)	-72 (20)	-253 (27)
1986	278 (103)	68 (24)	-48 (14)	-185 (8)
1987	363 (135)	46 (10)	a (1)	-129 (3)
1988	352 (133)	48 (11)	-55 (5)	-32 (2)
1989	340 (97)	77 (23)	-82 (7)	-275 (23)
1990	339 (85)	80 (36)	-79 (17)	-125 (14)
1991	305 (80)	63 (28)	-88 (17)	-150 (27)

a) Omitted to prevent disclosure.

Table B.6 ROA profitability group interest expense means of focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	116 (46)	114 (57)	150 (20)	151 (27)
1986	82 (101)	84 (24)	138 (14)	113 (7)
1987	64 (129)	53 (10)	a (1)	92 (3)
1988	87 (129)	70 (11)	133 (5)	28 (2)
1989	102 (92)	120 (23)	164 (7)	147 (23)
1990	99 (81)	130 (36)	192 (17)	75 (14)
1991	85 (74)	157 (28)	189 (17)	84 (27)

a) Omitted to prevent disclosure.

Table B.7 ROA profitability group depreciation expense means of focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	203 (46)	166 (57)	171 (20)	172 (27)
1986	188 (103)	170 (24)	148 (14)	168 (8)
1987	192 (135)	132 (10)	a (1)	246 (3)
1988	200 (133)	157 (11)	190 (5)	50 (2)
1989	211 (97)	170 (23)	198 (7)	193 (23)
1990	229 (85)	201 (36)	217 (17)	106 (14)
1991	242 (80)	241 (28)	233 (17)	157 (27)

a) Omitted to prevent disclosure.

Table B.8 ROA profitability group local equity means of focus firms in thousands of dollars

Year	Group I	Group II	Group III	Group IV
1985	2,126 (46)	1,496 (57)	1,105 (20)	965 (27)
1986	1,769 (103)	1,468 (24)	938 (14)	971 (8)
1987	1,876 (135)	1,022 (10)	a (1)	1,338 (3)
1988	2,064 (133)	1,351 (11)	932 (5)	524 (2)
1989	2,344 (97)	1,710 (23)	1,402 (7)	1,250 (23)
1990	2,550 (85)	1,959 (36)	1,458 (17)	843 (14)
1991	2,689 (80)	2,263 (28)	1,603 (17)	1,119 (27)

a) Omitted to prevent disclosure.

Table B.9 ROA profitability group debt-asset ratio means of focus firms (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	44.38 (46)	44.29 (57)	52.03 (20)	58.61 (27)
1986	42.55 (103)	37.28 (24)	57.60 (14)	44.36 (8)
1987	39.61 (135)	39.28 (10)	a (1)	40.86 (3)
1988	42.37 (133)	38.77 (11)	71.54 (5)	41.34 (2)
1989	41.40 (97)	42.54 (23)	56.12 (7)	54.26 (23)
1990	39.79 (85)	43.84 (36)	62.69 (17)	50.53 (14)
1991	41.20 (80)	46.29 (28)	68.62 (17)	52.15 (27)

a) Omitted to prevent disclosure.

Table B.10 ROA profitability group ROA means of focus firms (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	9.99 (46)	6.15 (57)	2.59 (20)	-3.44 (27)
1986	11.71 (103)	6.08 (24)	3.01 (14)	-3.32 (8)
1987	12.87 (135)	4.92 (10)	a (1)	-2.36 (3)
1988	11.32 (133)	4.73 (11)	2.98 (5)	-0.45 (2)
1989	9.72 (97)	5.74 (23)	2.01 (7)	-3.53 (23)
1990	9.02 (85)	5.79 (36)	2.35 (17)	-2.59 (14)
1991	7.42 (80)	4.27 (28)	1.80 (17)	-3.16 (27)

a) Omitted to prevent disclosure.

Table B.11 ROA profitability group ROE means of focus firms (in percentages)

Year	Group I	Group II	Group III	Group IV
1985	13.96 (46)	3.94 (57)	-5.78 (20)	-31.07 (27)
1986	17.28 (103)	4.25 (24)	-5.79 (14)	-15.32 (8)
1987	19.83 (135)	3.88 (10)	a (1)	-9.24 (3)
1988	16.97 (133)	3.22 (11)	-7.28 (5)	-6.63 (2)
1989	13.87 (97)	4.23 (23)	-10.07 (7)	-20.54 (23)
1990	12.57 (85)	3.80 (36)	-17.88 (17)	-15.22 (14)
1991	10.57 (80)	2.69 (28)	-8.13 (17)	-19.25 (27)

a) Omitted to prevent disclosure.