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THE ROLE OF THE BANKS FOR COOPERATIVES

IN COORDINATING INVESTMENTS IN INDUSTRY CAPACITY

presented by

Laura Marie Geis

has been accepted towards fulfillment
of the requirements for

a Ph.D. degree in Agricultural Economics

James D. Shaffer
Major professor

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THE ROLE OF THE BANKS FOR COOPERATIVES IN COORDINATING INVESTMENTS IN INDUSTRY CAPACITY

By

Laura Marie Geis

Volume I

A DISSERTATION

Submitted to
Michigan State University
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1993

ABSTRACT

THE ROLE OF THE BANKS FOR COOPERATIVES
IN COORDINATING INVESTMENTS IN INDUSTRY CAPACITY

By

Laura Marie Geis

During the 1980's, agricultural cooperatives in the U.S. experienced their greatest financial stress in fifty years. Many agribusiness industries are suffering from conditions of excess capacity. This research examined the role of the Banks for Cooperatives (BCs), part of the Farm Credit System, in reducing game-theoretic uncertainty in the investment decision environment by monitoring industry capacity and influencing the expansion decisions of their borrowers. Because the benefits of cooperative membership can be gained only by patronizing the cooperative, there is no secondary market for the equities of cooperatively owned firms. Consequently, an important coordination mechanism (the stock market) that is available to investor-owned firms is missing for cooperatives.

Three things are necessary for the BC's to successfully coordinate investments through their credit decisions: 1) they must provide a large share of the credit used by cooperatives, 2) their cooperative borrowers must have a large market share, and 3) the BC's must effectively use the information they receive from monitoring borrower accounts to guide the investment decisions of other borrowers wishing to expand. The study explored the extent to which each of these conditions is met in particular agribusiness industries, as well as the investment decision making practices of farmer cooperatives.

Data was obtained from two surveys: a census of the 290 largest cooperatives and a series of face-to-face interviews with senior members of the BC credit staff. It was found that the BCs have had a significant impact on the match of industry-capacity and long-run demand among local farm supply and grain cooperatives, where they have the

largest market share among lenders and the greatest influence over borrowers. In some parts of the country, they have played a very active role in rationalizing excess capacity by initiating mergers and joint ventures among their borrowers based on their independent analysis of borrower financial data. The factors limiting the banks' influence over borrowers were also explored.

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Bill Erickson, a loan officer with the St. Paul Bank for Cooperatives, endured countless questions from me when he was on leave from the bank to do a masters degree at Michigan State. The background information that he provided, as well as his critique of

the questionnaire for the survey of cooperatives, were invaluable. Other people who provided helpful criticism of the survey instrument were Dr. Michael L. Cook of the University of Missouri and Ron Stebbins of the Michigan Agribusiness Association.

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LIST OF ABBREVIATIONS

ACS = Agricultural Cooperative Service
BC(s) = Bank(s) for Cooperatives
FCA = Farm Credit Administration
FCS = Farm Credit System
IOF = Investor-owned firm
CEO = Chief Executive Officer
CFO = Chief Financial Officer

Chapter 1

A DESCRIPTION OF THE INVESTMENT COORDINATION PROBLEM

1.1. Farmer Cooperatives and Excess Capacity: Descriptive Statistics and Evidence of Coordination Failure

During the last several years, farmer cooperatives in the United States have struggled to adapt to changing market conditions through restructurings and joint ventures. Cooperatives in the 1980s faced their most serious financial stress in fifty years. Many cooperatives, particularly in the grain and farm supply industries, have been saddled with excess productive capacity, which limits their ability to serve their members.

Cooperatives have reported that serious excess capacity problems exist in grain storage, feed manufacturing, fertilizer mixing and application, farm input retailing, and many other lines of business. (See Chapter 4). Although in recent years excess capacity has been addressed through consolidations and closings, it persists in many areas, particularly among local grain and farm supply cooperatives.

It has been estimated that excess capacity in retail fertilizer operations in a 24 county area of Missouri results in farmers paying as much as 25 percent more than if cooperatives' capacity were matched with demand (Van Dyne and Rhodes, 1988). A

urvey of cooperative unit train grain loading facilities found them to be operating at 17 percent of total capacity in Iowa, two percent in Nebraska, and 43 percent in North Dakota (Cobia, et al., 1989).

As further evidence of financial difficulties from excess capacity, between 1970 and 1985, the total number of cooperatives in the United States declined by more than 2,000. Half of these went out of business, and the rest merged or were acquired (National Society of Accountants for Cooperatives, 1985). Furthermore, the values of property, plant, and equipment for the 100 largest coops have fallen during the 1980s, as coops have shed unprofitable fixed assets (Davidson and Kane, 1988). Cooperatives' net worth as a percent of total assets had declined markedly for the 100 largest, from 52.4 percent in 1962 to about 36 percent in 1986, indicating that they are becoming more highly leveraged as their asset values shrink. Although more recently cooperative financial performance has improved, reflecting the streamlining of operations in previous years, excess capacity remains a problem in many areas (Davidson, 1989).

In general, excess capacity occurs when there is overinvestment relative to future demand for a product. The current problems with excess capacity may be explained in part by the following demand-related factors: a less-than-anticipated demand for farm inputs due to the farm debt crisis, government commodity programs (in particular the PIK program from 1983 to 1988), or changes in transportation systems. On the other hand, the excess capacity problem may also be explained in part by supply-related factors. Overinvestment in productive capacity may have at its root government policies promoting cooperatives, or a lack of effective mechanisms for signalling investment plans to other cooperatives in the industry.

The response of agricultural economists to conditions of excess capacity in agribusiness industries has been focused on ways to mitigate the problem. Chambonnet and Schrader (1988) and Van Dyne and Rhodes (1988) addressed how to optimize local grain and fertilizer capacity relative to a given demand density in a specific geographic area. Van Dyne (1988) constructed a model to determine what size, location, and product mix would provide service to farmers at a minimum cost, given the existing facilities. Taylor and Vogler (1990) addressed how regional cooperatives could minimize costs to members by consolidating retail facilities and product lines. Gunn and Cobia (1989) surveyed cooperative managers about their responses to excess capacity problems.

The research thus far has focused on measuring or dealing with the consequences of excess capacity, but little emphasis has been placed on the decision making structures which allowed the problem to occur in the first place. Although the excess capacity currently being experienced by many cooperatives undoubtedly has many causes, one thing seems to be apparent: both as the dominant lenders to farmer cooperatives and as cooperatives themselves, the three Banks for Cooperatives have a key role to play in coordinating investments in productive capacity with anticipated future demand for that capacity.

These institutions, which are part of the Farm Credit System, provide loans and financial services to agricultural cooperatives, as well as rural electric, water, and telecommunications systems. The BC's also make loans to foreign buyers of U.S. cooperative-sourced agricultural commodities. Combined, the BC's served about 2,700 borrowers and hold over $12 billion in outstanding loans at year-end 1991.

1.2 Investment Coordination: What Is It and How Is It Accomplished? [1]

The activities of thousands of people may contribute to the production of a single good. Economic agents scattered over thousands of miles make decisions and act based on imperfect information and rules of thumb. A central economic problem is how to coordinate their contributions across space and time in an efficient manner, given that information and control mechanisms are imperfect (Shaffer, 1987).

"Coordination" refers to the matching of the supply of a good with the demand for it at every step of the vertical production sequence, at prices consistent with costs of production (Shaffer and Staatz, 1988). Economic theory tells us that when supply of a good is precisely matched with demand at prices equal to the marginal cost of production, resources are efficiently allocated. Much of the study of economics is concerned with how prices perform this coordinating function. However, markets are only one of several ways of coordinating supply and demand.

In general, coordinating mechanisms can be classified into three categories (markets, cooperatives, and integration), which refer to the type of transaction whereby the task of coordinating the actions of economic agents is accomplished. The value of this categorization is that it can assist the economist in diagnosing the sources of coordination failures, as well as the factors contributing to effective coordination of investments. Excess capacity is often an indicator of coordination failure. The investment of farm supply cooperatives in capacity to produce and distribute far more fertilizer than is demanded by farmers (resulting in either higher prices than necessary or lower or even

---

[1] Much of this discussion is drawn from Shaffer (1987), "Thinking About Farmers' Cooperatives, Contracts, and Economic Coordination", and Shaffer and Staatz (1986), "Potential Coordinating Functions of Farmer Cooperatives."

negative patronage dividends to cover the investment error) is an example of a coordination failure.

The process of investment by firms in productive capacity is a particularly difficult coordination problem. It takes place in an environment of pervasive uncertainty. This uncertainty derives not only from the inability of the firm to predict events which will affect future demand, but also from its inability to predict the investments that will be undertaken by rival firms in the industry. This second type of uncertainty, sometimes referred to as "game-theoretic uncertainty", is a function of the way in which the economic system is organized. The degree of game-theoretic uncertainty that a firm faces when undertaking an investment may be greater or lesser, depending on the predominant type of coordination mechanism that guides the investment decision. The challenge for policymakers is to design institutions to minimize game-theoretic uncertainty.

When market prices are the major coordinating mechanism, as is the case in highly atomistic industries such as farming, cycles of overinvestment and disinvestment may be observed. Say prices rise due to an increase in demand for a good. When hundreds of firms respond to the profit opportunity by expanding their capacity to produce, and particularly when investments are lumpy, i.e., when capacity cannot be expanded in small increments, investment may greatly exceed the increase in demand. This may be followed by a period of overexpansion and disinvestment as firms which are unable to cover their costs of production due to subsequent falling prices exit the industry. An example of this is the corn-hog cycle.

At the opposite end of the spectrum is coordination by integrated firms. This situation occurs when the buyer and seller of a good are integrated within a single firm. The movement of the good from producer to consumer is due to a direct, authoritative

order, rather than the price signals derived from the interaction of buyers and sellers in a market. For example, say General Motors acquired all the firms manufacturing windshield wipers. If demand for cars increases, GM executives may simply order an expansion of plant capacity in order to make just enough windshield wipers to meet the needs of the increased car production. Although coordination by integration removes some of the game-theoretic uncertainty experienced in market transactions, it also brings along other problems. For example, incentives may not encourage an upstream supplier to perform well since it sells in-house rather than competing for business.

In between markets and integration are cooperatives. In this mode of coordination, the production and exchange of goods is accomplished through a combination of market and integration mechanisms. Although cooperatives have characteristics of both markets and integration, they are fundamentally different from both and are best treated as a distinct mode of coordination. Although farmer members remain independent with respect to their own production and marketing decisions, they may choose to coordinate their decisions with other producers by participating in a separate business entity called a cooperative. The cooperative may act to coordinate supply with demand by the way in which it contracts with farmers for the products it will process and sell, in the case of a marketing cooperative, or through its decisions regarding production of inputs to be purchased by its members, in the case of a farm supply coop. Members of a cooperative delegate to agents (the cooperative's managers) the power to make certain decisions on their behalf, subject to oversight by a board of directors and the threat of defection by members. In this sense, coordination is undertaken by a committee of agents representing a constituency of autonomous firms which share in the cooperative's surplus on the basis of their patronage.

In studying problems of economic coordination, it is useful to distinguish four levels of aggregation:

1. Coordination within firms (micro-micro coordination)
2. Coordination between individual firms (micro coordination)
3. Coordination of total supply with total demand for commodities or industries at each step in the production-distribution process (macro coordination)
4. Coordination of aggregate demand with aggregate supply for the economy as a whole (macro-macro coordination).

Economic actors face different coordination problems and have developed different coordination mechanisms or institutions at each level. Moreover, the effectiveness of coordinating institutions at one level affect outcomes at other levels. For example, decisions within firms influence the outcomes of markets, and market outcomes (prices) are part of the environment to which firms respond. In the case of the Banks for Cooperatives, actions undertaken by the Federal Reserve to coordinate aggregate demand and aggregate supply at the macro-macro level can influence coordination by the BCs at the micro level through changes in their cost of funds and competitive position relative to other financial institutions. A particular coordination problem may be influenced by coordinating institutions at all levels of aggregation. The research challenge is to evaluate the effectiveness of these institutions at each level of aggregation and to understand how they interact.

Investment coordination has both a vertical and a horizontal dimension (Richardson, 1960). Vertical coordination takes place with respect to complementary investments, i.e., it determines whether the investments of an input industry are sufficient

to allow firms in the next stage of the vertical production sequence to expand output as needed. Horizontal coordination takes place with respect to competitive investments undertaken by firms in the same industry.

The Banks for Cooperatives have a role to play in both horizontal and vertical coordination. The BCs represent an effort by farmer cooperatives to vertically integrate backward in order to supply their credit needs. Farmer cooperatives, in turn, are the result of an effort by farmers to vertically integrate forward into processing industries or backward into farm supply industries, as well as to integrate horizontally to increase their market power (i.e., bargaining cooperatives). This research will examine whether the BCs are able to improve vertical coordination of investments between the farmer and cooperative.

The Banks for Cooperatives may also be able to improve horizontal coordination. In situations where they are the dominant lender to most of the firms in a market or industry, they are in a position to take authoritative actions to ensure that planned investments will not result in supply greatly exceeding or falling short of demand. This is particularly important when reliable mechanisms for the signalling of investment plans are not present in an industry.

The problem of investment coordination requires that the game-theoretic uncertainty imposed on one firm by another firm's actions be minimized. Since game-theoretic uncertainty is a function of how the economy is organized, it can only be reduced by appropriate mechanisms for signalling the investment plans of other firms. The three Banks for Cooperatives, which are cooperatively owned themselves, may be such a mechanism.

This framework for analyzing how the economic system coordinates the investment decisions of individual firms will be useful in understanding the coordination failure currently being experienced by some of the industries in which cooperatives play a large role. However, first it is necessary to examine in greater detail the potential coordination functions of cooperatives.

1.3 The Role of Cooperatives in Coordination

Farmer cooperatives act as a coordinating mechanism in a way that is distinct from both markets and integration, although they incorporate aspects of both. On the one hand, transactions between cooperative members and the cooperative firm itself are different from market transactions because the actual terms of the exchange are contingent upon the patronage rebate. The patronage rebate, in turn, is influenced by the overall performance of the cooperative, as well as the goals of its management and directors. On the other hand, transactions between a cooperative and its members also differ from integration in that members remain independent profit centers. Although they may collectively influence the operations of the cooperative, the cooperative has no control over the members' firms. The ability of the cooperative to act as a coordinating institution depends on its organizational structure and standard operating procedures, which are the central focus of this research.

For purposes of understanding how cooperatives may improve coordination of the food system, it is useful to examine coordination efforts at two of the four levels of aggregation: 1) micro (between members and their cooperative and between firms in the same industry), and 2) macro (between industries in adjacent stages in the production and distribution of a good).

Cooperatives may act to improve coordination at the micro level in a number of ways. For example, a processing cooperative may be able to improve coordination by offering more explicit or complete contracts for the type, timing, quantity and quality of produce moving from the grower to the processer than a market transaction.

At the macro level, a cooperative may improve coordination of supply and demand between industries by influencing members' decisions to invest in, produce and market a particular product. For example, a processing cooperative may try to influence production decisions and thus supply by limiting the amount of produce it will purchase from members, which may involve restricting coop membership. It may improve coordination of demand and supply by acting to increase demand for a product through advertising and promotion. This research will be concerned with the micro-level relationship between the BCs and their members, and how coordination mechanisms at this level will affect coordination within and between industries. For example, the BCs' unwillingness to provide credit for a particular investment project may affect the match of supply and demand for a product in the long run.

Cooperatives are very flexible institutions which may respond in a variety of ways to the needs and circumstances of their members. In order to understand the particular coordinating functions of a cooperative, it is necessary to examine the details of the transactions it makes with its members, as well as the other firms with which it deals. This involves studying the practices of the cooperative, as they are embodied in standard operating procedures, the rules of thumb used for decision making by members, directors and management. However, before delving into the role of the Banks for Cooperatives, it is necessary to examine in greater detail the political nature of the investment

coordination problem and to describe the process whereby firms make capacity expansion decisions.

1.4. The Political Nature of Investment Coordination

Investment coordination is fundamentally a property rights issue. The success or failure of an individual investor hinges on how property rights are defined with respect to the externalities that one investor may impose on another. These externalities were recognized in one of the very first cases of trade regulation in British common law:

> As if I have a mill, and my neighbor builds another mill whereby the profit of mine is diminished, I shall have no action against him...(Handler, Blake, Pitofsky, and Goldschmid, p. 42).

This was the "Schoolmaster Case" of 1410, which began a body of common law that sought to limit the number of persons practicing a given trade or profession in a particular locale. In effect, this was coordination of investments in both physical and human capital. The courts determined the value of an individual's property (intellectual or otherwise) by limiting excessive competition that might have diminished the returns from the investment. In earlier times, the medieval guilds were quite effective in limiting capacity and maintaining quality by restricting entry into certain professions and maintaining standards for their practice.

The investment coordination problem is fundamental to every economy. Shaffer (1990) presents an updated but very similar statement of the problem:

> ...suppose that you were to conduct a careful analysis of the market for a restaurant...Based on that information, you invest your life savings in the business, including the building, equipment, training of staff, and advertising, and install the optimum sized restaurant for that location. The restaurant is just large enough to produce sufficient revenue to meet all costs and return a normal profit. Now suppose that I see your successful enterprise and decide to build a restaurant of comparable capacity across the street. As a result, you lose business and neither of us can cover our

> variable costs...The value of the fixed assets of both business drops to its salvage value, which is less than our debt, and each of us must file for bankruptcy (pp. 66-67).

A few court cases in the U.S. have addressed competition in the professions, and in early America, the courts upheld the granting of monopoly charters to firms undertaking particularly risky investments, such and bridges and steamships. Charters served to regulate competition in a highly uncertain environment. However, as time passed, the economic environment became less uncertain. Many large investments were being made without exclusive charters, and the practice of coordinating investments through the granting of charters was dropped (Schmid, 1991).

The fifth amendment to the U.S. Constitution states in part that "no person shall...be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use without just compensation." However, due to the selective perception of policy makers and economic actors, investments in productive capacity are not treated as "property" that an investor may be deprived of by the investment of a rival firm. No "due process of law" is available to the restauranteur whose business fails as a result of the investment of another (Shaffer, 1990).

Regardless of whether it is explicitly addressed by public policy, the fundamental political-economic question remains. Investments still must be coordinated effectively in order to avoid the waste of economic resources in what should be unnecessary bankruptcies. The U.S. government has not directly addressed the coordination problem. Instead, the coordination task is left to be managed by a number of institutions which facilitate market signals leading to a more or less stable outcome, e.g. trade associations, the financial press, securities markets, and investment and commercial banks.

Institutions in the economy must strike a delicate balance. On the one hand, allowing too much power to be concentrated in a few firms may improve investment coordination, but at the cost of oligopolistic pricing and other potential abuses of power. On the other hand, laws encouraging a high degree of competition among many firms may result in higher production and lower prices, but at the cost of cyclical periods of investment and disinvestment.

Designing institutions which coordinate investments through effective signalling is central to working out the coordination problem. Because banks play a central role in the formation and allocation of capital, it is relevant to examine how they take into account information about planned investments that would compete with the investments of their borrowers. Banks that provide a large share of the credit needed by a given industry are in a particularly good position to coordinate investments industry-wide by extending or denying credit. In effect, they should be able to "turn off the tap" of credit flowing into a market in which planned and existing capacity is fairly well-matched with projected demand. The challenge in this research is to investigate the current role of the BCs in coordinating investments in industries dominated by farmer cooperatives, as well as to propose new institutions to improve coordination.

1.5 Expansion of Industry Capacity: Factors in Firms' Decisions [2]

Firms face a wide variety of strategic decisions, such as what to produce and how to produce it, how to finance production and market the products. Probably the most important strategic decision that a firm may make is the decision to expand productive capacity. Capacity expansion decisions often involve a larger commitment of the firm's

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[2] Much of this discussion is drawn from Competitive Strategy by Michael Porter (1980), Chapters 15 and 16.

resources, a higher degree of risk, and a more complex analysis than any other strategic planning task faced by a firm. Additions to productive capacity generally involve substantial lead times, and the payoff from the investment will stretch over many years. For this reason, the expectations of the firm regarding future demand for its products and the behavior of competitors are crucial inputs into the capacity expansion decision.

The quality of the information going into this decision-making process will determine not only the success of an individual firm's investment, but also the long run evolution of industry structure. The quality of this information, especially about the capacity expansion plans of rival firms, is in turn a function of how the economy is organized. The availability of appropriate mechanisms for signalling the investment plans of industry participants has a major impact on the long-run growth and stability of an industry. This section will examine the decision-making process of a typical firm, including the information that must be gathered and the assumptions that must be made.

The expansion of industry capacity can occur in either of two ways: 1) expansion by existing firms, or 2) entry by newcomers. Most aspects of the decision-making process are common to both ways of expanding capacity. However, the new entrant into an industry faces a somewhat more complicated task in predicting retaliation by incumbent firms and overcoming structural barriers to entry.

1.5.1. The Decision Making Process

The mechanics of capital budgeting are straightforward, and seem simple when presented in a textbook. Cash flows are discounted and benefits compared to costs for each project. However, the most important part of the decision-making process is not how to make the mechanistic calculations, but rather how to decide on the numbers that

go into them. Future profits depend on many things, including the size and timing of the capacity additions of each competitor, future demand for the product, changes in technology, and any number of other factors.

Porter (1980) breaks down the process of making capacity expansion decisions into seven steps (see Table 1.1). In reality, the process is an iterative one, which may be repeated for several types of capacity additions as well as economic scenarios. There is a need to continually adjust assumptions to be consistent as more information is added to the model.

In the first step, managers must determine the firm's options regarding the size and type of capacity additions. Size may be determined by the availability of financing, and the type of technology chosen will depend on the pace of technological innovation in the rest of the industry and in adjacent industries, as well as the rate at which coordinating institutions are able to adapt to new conditions.

Second, managers must assess probable future demand and the cost of the inputs that correspond with each of the options considered in the first step. Input prices must be forecasted, anticipating the effects of any input supply bottlenecks that might develop as demand for inputs rises. The accuracy of these forecasts will depend on a large number of subjective economic judgments based on expectations. Therefore, it may be useful to consider several different scenarios.

In the third step, the firm's management must try to anticipate the likely technological changes and the probability that widespread adoption of new technology by other industry participants will render the investment obsolete. One role of economic institutions is to control the rate at which new technology replaces old. Obviously, there is a balance to be struck between the rate of innovation and the rate at which society can

Table 1.1	
The Capacity Expansion Decision Process	
1.	Determine the firm's options for the size and type of capacity additions
2.	Assess probable future demand and cost of inputs
3.	Assess probable technological changes and probability of obsolescence
4.	Predict capacity additions by each competitor based on the competitor's expectations about the industry
5.	Use information gathered in steps 1 - 4 to forecast a supply/demand balance for the industry, and resulting industry prices and costs
6.	Determine expected cash flows from capacity addition
7.	Test the analysis for consistency
Source: Michael Porter, Competitive Strategy, p. 326.	

absorb these changes (Shaffer, 1969). This balance is in the realm of public policy as it affects business investment decisions, another factor which complicates the capacity expansion process.

Fourth, management of the investing firm must predict the capacity additions which might be undertaken by competitors. This is the most crucial element of the

capacity expansion decision process, as well as the central focus of this research. Some firms rely on an extensive intelligence system for gathering and analyzing information about competitors. Others rely on simple market signals, such as prices, which reflect past investments, but do not accurately signal future ones. Still other firms seek knowledge of competitors' investments through trade associations or other institutions, such as banks, that facilitate the exchange of information.

In the fifth step, the information gathered in the first four steps is combined to forecast a supply and demand balance for the industry, as well as resulting output prices and input costs.

Sixth, these prices and costs are used to project cash inflows and outflows associated with the capacity addition. These cash flows are then discounted to their present value, and benefits are compared to costs to determine the profitability of the investment and to rank investment possibilities.

In the seventh step, the model must be checked for inconsistencies. Because the modelling process is so complex, assumptions must be continually revised as the inputs into the model are changed. Each assumption that is made will affect the cash flows that are estimated based on other assumptions. Moreover, predictions of rival firms' activities may have to include a "learning curve" effect as some firms make late attempts to add capacity. Multiple scenarios will have to be examined with assumptions varied in a meaningful way.

Once firms in an industry become convinced that demand will expand enough to warrant additions to capacity, their strategy becomes one of preemption. Each firm races to be the first to add capacity, and at the same time, they try to signal to other firms that

they should not expand. When too many firms are quick to add capacity and signalling is ineffective, overbuilding of capacity is the result.

Due to his perception of investment issues from the point of view of investing firms, Porter does not treat underbuilding of capacity as an important issue. When an industry does not have enough capacity to meet demand, prices rise to allocate the scarce product to those who are willing to pay the most for it. From the point of view of the firms in the industry, the higher profits that result are desirable. However, underinvestment has a real economic cost, which is borne by the consumer. Moreover, underinvestment is not unrelated to overcapacity. When limited funds are misinvested and "lost," as is the case with overbuilding, they are not available for more productive uses. Each time capacity and future demand are mismatched, regardless of whether capacity is too much or too little, prices for the industry's products are made more volatile. This adds to investors' perceptions of risk, and may deter them from investing at all.

1.5.2. Causes of Overbuilding Capacity

Commodity businesses have a long history of overbuilding. This is in part because demand is cyclical, but also because products are not differentiated. Competition is largely based on the price of the good, and thus on the firms' underlying costs. Moreover, when there is no brand loyalty, the volume of a firm's sales are closely related to the amount of capacity it has.

Porter presents a number of causes of overbuilding capacity, which he sorts into six categories: technological, structural, competitive, information flow, managerial, and governmental.

Technological causes of overbuilding are those that are characteristics of the production function. For example, when technology dictates that capacity must be added only in large lumps, the likelihood of overbuilding is increased. When economies of scale or learning curves are present, firms with the largest capacity will have a cost advantage over rivals. When many firms expand simultaneously in order to capture economies of scale, the likely result is excess industry capacity. The existence of long lead times in adding capacity increases uncertainty and may encourage investment because there is a greater penalty to the firms who do not expand early. When the minimum efficient size of plants is increasing, the total number of plants in an industry must decrease, or there will be excess capacity. In the process of consolidating the industry, it is likely that many firms will build new, larger plants, while the old plants may not be immediately idled. As technology becomes obsolete, the rate at which the transition to new technology takes place will determine the degree to which excess capacity exists.

Several structural characteristics of industries may also encourage overbuilding. Significant exit barriers may prevent firms from exiting the industry when new plants, incorporating the latest technology, are built. Suppliers to an industry may encourage overbuilding through price cuts and easy financing designed to expand the market for their products. In some cases, a new industry must build credibility with customers by investing in capacity before demand for their products will be generated. An example of this is the corn sweetener industry. Beverage and food manufacturers were unwilling to change their recipes from sugar to high fructose corn syrup until they were sure that enough HFCS capacity existed to prevent them from being vulnerable to a few suppliers. Also, if rival firms integrate downstream, overbuilding may result as each firm wants to be able to supply its own downstream units.

Competitive factors may also cause an industry to overexpand its capacity. This problem is most severe in an industry in which there is a fierce battle for market share with many firms trying to preempt each other. When there is a lack of credible market leaders to effectively enforce an orderly expansion process, excess capacity may result. New entrants may also seek a significant market share if they can only enter successfully on a large scale. If incumbent firms refuse to accommodate them, the industry may experience excess capacity. Also, shorter lead times on investments and lower costs on equipment could encourage many firms to try to capture first mover advantages by rushing to expand capacity.

Characteristics of the flow of information to management in the decision-making process may also result in overbuilding of capacity. Managers may be overly optimistic, inflating expectations of future profits. Firms may under- or over-estimate the likelihood of rivals expanding. When firms do not trust each other's market signals, the capacity expansion process is likely to be more unstable. When an industry is undergoing structural change that requires firms to invest in new capacity, they may incorrectly assess their relative strength and overbuild as a result. Pressure from the financial community may also destabilize the dynamic equilibrium of an industry. For example, security analysts may put pressure on management of a firm to expand simply because a rival has.

Managerial issues may also contribute to excess capacity. Overbuilding is less likely if management of the firm is more oriented toward the marketing or financial aspects of the business. Production-oriented managers put a high premium on having the newest technology, causing them to invest regardless of whether the market can absorb the increased production. Managers may also have an asymmetrical aversion to risk. They have more to lose when they have insufficient capacity than when they have excess

capacity. In the latter case, other firms in the industry are probably in the same position, and the firm may not have changed its relative market share.

Finally, there are governmental factors, such as perverse tax incentives, that may encourage overbuilding. The desire for an indigenous industry and nationalistic fervor may also lead to overbuilding, particularly if the minimum efficient scale is large relative to the world market. Pressure from the government to increase or maintain employment may accentuate overcapacity by encouraging firms to stay in business.

Porter also identifies checks on the tendency to build too much capacity. These include: financing constraints, company diversification, infusion of top management with a finance background, costs of pollution control, and widely shared uncertainty about future demand. An industry's past experience with periods of excess capacity may also check its tendency to overbuild.

1.6. Research Questions

This chapter has presented some evidence of investment coordination failure in the cooperative sector, discussed some of the basic concepts involved in investment coordination, and examined the capacity expansion decision process of a firm, an understanding of which is essential for analyzing the investment coordination problem. Later chapters will look more specifically at capacity expansion decision making by cooperatives, as well as the credit decisions of the BCs, in an effort to understand the role of the banks in investment coordination.

The main research question is: As the dominant lenders to the cooperative sector, can the Banks for Cooperatives influence the match of productive capacity and future demand by controlling the flow of credit into a particular industry? In order to answer

this question, three research objectives have been identified: 1) to understand how the BCs coordinate investments through credit decisions, which involves analyzing the sources and uses of market information in the loan decision making process, 2) to analyze the constraints faced by BC management in attempting to maintain a large share of the cooperative credit market, and 3) to analyze alternative mechanisms for improving the BCs' investment coordination performance.

Chapter 2

RESEARCH METHODS

2.1. Overview of Research

This research project sought first to diagnose the excess capacity problem, then to examine some of its causes that are related to the decision making structure of farmer cooperatives, and finally to examine what the Banks for Cooperatives do or might do to address the mismatch of capacity and demand in cooperative-dominated industries. These elements of the study were addressed through literature reviews, a mail survey of cooperatives eligible to borrow from the BCs, and interviews with BC officials.

Three separate literature reviews were undertaken. The first dealt with the concept of investment coordination in the economics literature, with particular attention paid to the treatment of game-theoretic uncertainty in the capacity expansion decision process of firms. The second literature review focused on the aspects of capacity expansion decision making that are unique to cooperatively owned firms, including the characteristics of the industries that farmer cooperatives have traditionally participated in, the structural characteristics of the cooperative firm that impact on investment decisions, and the characteristics of members and directors of farmer cooperatives. The third

literature review concerned the role of banks in coordinating investments, and compared the banking systems of Japan, Germany and the United States to gain insights into the potential coordinating role of the BCs. These literature reviews served to provide a conceptual framework for analyzing the investment coordination problem and to raise important research questions.

Following reviews of the literature, the role of the BCs was explored in greater detail. Early drafts of chapters 6 and 7 on the BCs' share of the cooperative credit market and their coordination of investments through credit decisions laid out the initial propositions regarding the BCs' coordinating role.[1] These chapters were later supplemented with information from a survey of borrowers. Chapter 8 examines proposed alternative institutions for improving the investment coordination performance of the BCs.

Surveys of the BC lending staff, as well as cooperatives eligible to borrow from the BCs, provided information to clarify the original propositions about the BC role. This information was collected through a mail survey, telephone interviews, and face-to-face interviews with the relevant decision makers. The drafts of these chapters were then revised to reflect past and current BC practices, as well as potential changes that might be implemented by the BCs to improve their investment coordination performance. Chapter 8 discusses two proposed alternative institutions, a capacity planning system and industry-based profit centers, whose adoption by the BCs might improve their ability to coordinate investments. The major advantages and disadvantages of each, as well as the impediments to their adoption, are discussed. These were explored in the interviews with the BC staff,

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[1] The author's interactions with Bill Erickson, a loan officer on leave from the St. Paul BC to do a masters degree in agricultural economics at Michigan State, were an important source of information and insights in formulating the research questions. In addition, interviews were conducted with three other BC loan officers to gain background information on the loan decision making process in order to formulate research questions.

as well as the survey of borrowers. The two surveys, which were a critical part of the research, are examined in greater detail below.

2.2. The Borrower Survey

2.2.1. Goals of the Survey

The survey of cooperatives eligible to borrow from the BCs had three main goals. One was to elicit information about the strategic planning process of cooperative firms, as well as the role that the BCs play in that process. The second goal of the survey was to gain information about the decisions of cooperatives regarding whether to obtain debt financing from the BCs or from other credit sources. Borrowers' opinions of major BC policies concerning loan pricing and bank capitalization were solicited, with the goal of revealing the constraints faced by BC management as they attempt to maintain a high share of the credit market for an increasingly heterogeneous group of borrowers. A third goal was to provide evidence to support or refute propositions about investment decision making drawn from the literature and theoretic reasoning.

2.2.2. Survey Design

A questionnaire was developed which focused on the three broad goals described above. The first part of the questionnaire concerned the role of the BCs in the strategic planning process and the degree of influence BC management has over the decisions of their borrowers. These questions centered on the information sources that cooperatives rely on in their strategic planning, particularly those sources of information used to reduce the game-theoretic uncertainty inherent in decisions to expand capacity.

In the second part of the questionnaire, which dealt with the factors determining the BCs' share of the cooperative credit market, questions targeted the following issues:

1) the cooperative's current sources of debt financing, 2) the BCs' loan pricing practices, 3) BC capitalization methods, 4) their specialized lending expertise, and 5) intangible factors influencing the decision to seek financing from a BC. Because they were thought to be an important determinant of BC market share, a large portion of the questionnaire concerned loan pricing practices, specifically, the BCs' security requirements and the cost allocation policies which determine the size of the various components of the loan price for individual borrowers. Because the BCs are cooperatively owned, borrowers' perceptions of being treated fairly were thought to be an important factor in their decisions regarding where to seek financing. The fact that perceptions of fairly qualitative issues are being solicited suggested using a question format which asks respondents to indicate the extent to which they agree or disagree with statements about BC policies.

The third section of the questionnaire focused on respondent characteristics, such as size, industry and level of borrowing from the BCs, factors that were thought to influence responses to other questions. These characteristics later were used in cross-tabulations to seek out differences in responses across various groups of firms.

Information was sought on how decisions are made as well as on the attitudes which influence those decisions. The type of information sought dictated the format of the questions. Questions pertaining to decisions addressed the two aspects of decision making: 1) information sources used in making the decision, and 2) evaluative criteria (how the person evaluates the information in coming to a decision). Questions intended to measure attitudes focused on the three parts of an attitude: 1) the knowledge component or awareness of the issue, 2) the feeling component, or level of intensity of feelings about the issue, and 3) the action component, or how knowledge and feelings translate into action (Alreck and Settle, 1985). In order to ensure that all respondents

had a minimum level of knowledge about the issues, short summaries were included before each group of questions outlining the major issues in a few sentences. These were followed by questions using a Likert scale to measure the intensity of feeling about each issue. Finally, questions were included to determine how knowledge and feelings lead to certain actions, such as the act of seeking a loan from a source other than the BCs. A copy of the questionnaire used in the borrower survey can be found in Appendix B.

The majority of the questions were very structured. A few open-ended questions were included in order to allow the respondents to raise issues that may affect BC market share, but were not anticipated and covered in the questionnaire.

The questionnaire went through several drafts, with criticism and feedback sought from approximately twenty faculty members and graduate students in the economics and agricultural economics departments at Michigan State, two managers at the St. Paul Bank for Cooperatives, the former CEO of one of the Fortune 500 cooperatives, and the executive director of the Michigan Agribusiness Association, who was also the former CEO of a small grain and farm supply cooperative that was included in the survey. Pre-testing the survey was problematic because a census was being undertaken, rather than a sample, so that there were no firms outside the survey population that could be asked to pre-test the survey instrument. The two former CEOs who critiqued the survey were judged to be an adequate substitute for a formal pre-test, as they represented the perspective of a very large and a small cooperative.

2.2.3. Selection of the Survey Population

A census of cooperatives eligible to borrow from the BCs was undertaken, targetting the largest cooperatives in the country. Names and addresses of these firms

were obtained from the Directory of Farmer Cooperatives published in December, 1991 by the Agricultural Cooperative Service. The directory contains a state-by-state listing of over 300 cooperatives, most of which had over $30 million in sales in 1990. For states where no cooperative had sales greater than $30 million, the five largest were included. In addition, other cooperatives were added to the directory based on the uniqueness of their products or services.

The mailing list for the borrower survey was compiled by deleting from the directory all cooperatives that do not make substantial investments in fixed assets, for example, fruit and vegetable bargaining associations, artificial insemination cooperatives or cooperatives organized primarily for price discovery via electronic livestock auctions. Questionnaires were sent to the remaining 309 cooperatives. The population was subsequently reduced by 19 firms, from 309 to 290, for a variety of reasons. Some were bargaining associations that were mistakenly included. Some went out of business, ceased to be active or were reorganized as investor-owned firms, and some were not "true" cooperatives, but rather vehicles for the administration of USDA price support programs in peanuts and tobacco.

The 290 firms in the survey population are very representative of the U.S. cooperative sector as a whole and account for the majority of cooperative sales. The Agricultural Cooperative Service reported in June of 1992 that there were 4,663 agricultural cooperatives in the U.S.[2] Of this number, the largest 300 account for more than two-thirds of the $77.3 billion in total cooperative sales in 1991, although they comprise only 6 percent of the total number of farmer-owned cooperatives. Fourteen of these cooperatives are on the Fortune 500 list of the largest industrial corporations in the

[2] Farmer Cooperatives, June, 1992, p. 13.

country. These fourteen cooperatives accounted for 25.2 percent of all sales by agricultural cooperatives in 1990. The survey population thus consists of the cooperatives whose investment decisions have the largest impact on their respective industries, as well as the U.S. agribusiness sector as a whole.

The data from the survey was analyzed using frequency tables for description of categorical variables, summary statistics for continuous variables, and cross-tabulations to measure associations between the responses to various questions. The software used was the Statistical Package for the Social Sciences (SPSS) Version 4.0.1 on a microcomputer.

2.2.4. Survey Implementation

The study was administered as a mail survey, because of lower data collection costs and the ease of reaching a geographically dispersed population. Following the total design method outlined by Don Dillman (1978), the implementation took place in three phases. In the first phase, beginning on April 6, 1992, questionnaires, cover letters and business reply envelopes were mailed to the CEOs of 309 cooperatives. One week later, a postcard was mailed to each cooperative, thanking those who returned the questionnaire promptly and urging those who had not to do so. The response rate to the first mailing was approximately 41 percent.

In the second phase of the survey implementation, a second copy of the questionnaire, a more strongly worded cover letter and a business reply envelope were sent to each non-respondent. The second mailing took place on April 27. The response rate to the second mailing was approximately 19 percent, bringing the total survey response rate up to 60 percent. (Copies of the cover letters and postcard can be found in Appendix C).

In the third phase, during the week of June 1 - 5, follow-up phone calls were made to 31 (26 percent) of the non-respondents. An analysis was done of the response rate of firms in different size categories and commodity groups, and the firms chosen for follow-up calls were either very large cooperatives or those in underrepresented categories. The phone calls elicited responses from another six firms, bringing the total response rate for the survey up to 61.4 percent, or 178 firms responding out of 290 in the survey population.

In the follow-up phone calls, an attempt was made to discover why respondents had failed to return the questionnaire. The most common response was that the CEO or CFO of a cooperative had a policy of not participating in surveys, which was more often true of the larger cooperatives. In addition, several of the firms targetted in the third phase did not fill out the questionnaire because they did not feel it was relevant for them. These firms had no long-term borrowing, with the BCs or other lenders. Although some reported using the BCs occasionally for seasonal financing, they seemed proud of the fact that they managed to expand as needed without going into debt. One cotton cooperative reported that they haven't borrowed from a BC in 5 years because they get better rates and more political clout with local farmers from a local bank.

Although several non-respondents cited not borrowing from the BCs as their primary reason for not completing the questionnaire, this was not thought to indicate a bias in the answers of the responding group. Of the 178 firms who responded, 22 percent of them reported currently doing no borrowing from a BC (see Table 2.3 below).

2.2.5. Characteristics of Respondents

Respondents to the survey were asked to describe several characteristics of their cooperatives: 1) size of firm measured by annual sales, 2) whether they do the majority of their business with farmers or other cooperatives, 3) their level of borrowing from the BCs, 4) the primary commodity handled by the cooperative, 5) which BC they do the most business with, and 6) the position of the person filling out the questionnaire.

The cooperatives responding to the survey were fairly evenly distributed across size categories, with a somewhat larger number of them in the largest category (annual sales greater than $100 million). Twenty-three percent of respondents had less than $30 million in total annual sales, while 19.8 percent had sales of $31 to $50 million, 19.8 percent from $51 to $99 million, and 37.3 percent with sales of $100 million and above. (See Table 2.1).[3]

However, this distribution by total sales masks a more pronounced heterogeneity which became evident when cooperatives identified their sales in both the farm supply and marketing areas. In both of these areas, a bimodal size distribution of firms was revealed. For marketing cooperatives, most firms reported having sales of less than $30 million (30.5 percent of respondents) or greater than $100 million (34.4 percent of respondents). There were far fewer firms falling into the middle size range of $31 to $99 million. Among farm supply cooperatives, the size differences were even more pronounced. Due to the geographical limitations on the size of their market areas, 71.8 percent of farm supply cooperatives had annual sales less than $30 million, while 15.5 percent of them had sales greater than $100 million. These were mostly regional cooperatives manufacturing

[3] In the tables, the question is identified by the number listed in the questionnaire, which can be found in Appendix B.

Table 2.1			
Size of Survey Respondents			
III.1. What are the annual sales of your cooperative?			
Annual sales	Percent of Respondents Reporting Sales in Each Category [1]		
	Marketing	Farm Supply	Total
Less than $30 million	30.5	71.8	23.2
$31 to $50 million	20.1	9.7	19.8
$51 to $99 million	14.9	2.9	19.8
$100 million and over	34.4	15.5	37.3
[1] Of the 178 respondents, 154 reported sales in the marketing area, and 103 reported sales in the farm supply area.			

and wholesaling farm supplies. However, many cooperatives have both marketing and farm supply enterprises, causing a more even size distribution when total sales are considered.

Table 2.2		
Break down of Respondents Into Regional and Local Cooperatives		
III.2 Do you do the majority of your business with:		
Response	Frequency	Percent [1]
Farmers	148	85.1
Other cooperatives	26	14.9
[1] Percentages based on 174 valid cases.		

Most of the respondents (85.1 percent) were locals, i.e., they reported doing the majority of their business with farmers. The remaining 14.9 percent did most of their business with other cooperatives, and therefore were classified as regionals. (See Table 2.2).

Respondents reported levels of borrowing from the BCs that ranged from nothing to $400 million. The mean level of borrowing was $21.6 million. Twenty cooperatives borrowed more than $50 million, and of those, only seven borrowed more than $100 million. (See Table 2.3). This reflects the very skewed size distribution of BC members. For example, the St. Paul Bank's 10 largest borrowers accounted for 66.4 percent of gross loans outstanding at year-end 1991. Similar figures were not available for Springfield or CoBank, but 26.9 percent of CoBank's domestic loan portfolio at year-end 1991 consisted of transactions made with cooperatives which have a representative on CoBank's 33-member board of directors.

Table 2.3

Respondents' Level of Borrowing from the Banks for Cooperatives

III.3. What is your level of borrowing from the Banks for Cooperatives?

Borrowing category	Frequency	Percent [1]
Zero borrowings	38	22.9
$1 to $10 million	68	39.8
$11 to $50 million	45	26.3
$51 to $100 million	13	7.6
Greater than $100 million	7	4.1

[1] Percentages based on 171 valid cases.

Table 2.4 shows the breakdown of respondents by commodity group. The largest category is farm supply cooperatives, comprising 20.8 percent of all respondents. Dairy cooperatives accounted for 19.1 percent of respondents, followed by grain and fruit and vegetable cooperatives as the next largest categories. A category was added when coding the returned questionnaires to classify the 11.2 percent of respondents who do an equal amount of business in the farm supply and grain areas.

Table 2.4

Breakdown of Respondents by Commodity Group

III.4 How would you classify your cooperative by commodity group? (choose one)

Response	Frequency	Percent [1]
Fruits/vegetables	27	15.2
Farm supply	37	20.8
Dairy	34	19.1
Grain	27	15.2
Sugar	6	3.4
Rice	2	1.1
Cotton	8	4.5
Poultry/livestock	10	5.6
Farm supply and grain [2]	20	11.2
Other:_____ [3]	7	3.9

[1] Percentages based on 178 valid cases; i.e., no missing values.
[2] A separate category was added for the cooperatives that reported that their business was evenly divided between farm supply and grain.
[3] The category "other" includes: seed marketing, honey, petroleum, catfish and dry beans.

The industry breakdown of survey respondents is comparable to the distribution of CoBank's agribusiness borrowers, shown in Table 2.5. Because of a lack of data on the characteristics of agricultural cooperatives, it is difficult to judge whether there is substantial non-response bias in the survey data. Based on CoBank's distribution of borrowers, the industry breakdown of respondents appears to be fairly representative of the population as a whole.

Of the three BCs, CoBank was the one that the majority of respondents did most of their business with (62.9 percent). A much smaller percentage of respondents (13.7 percent) reported borrowing from St. Paul, and eight percent borrowed from Springfield.

Table 2.5	
Distribution of CoBank Agribusiness Borrowers by Industry	
Industry	Percentage of Outstanding Loans
Farm Supply	21
Grain	18
Fruit, Nuts and Vegetables	17
Other [1]	13
Dairy	9
Chemical	6
Oilseed	6
Credit and Finance	6
Sugar	4
[1] Includes wood/paper, cotton, rice, livestock/poultry. Source: CoBank, 1991 Annual Report, p.8.	

Table 2.6		
Breakdown of Respondents by Relationship with a Bank for Cooperatives		
III.5 Of the three BCs, which one do you do the most business with?		
Response	Frequency	Percent [1]
CoBank	110	62.9
St. Paul	24	13.7
Springfield	14	8.0
No relationship with a BC	27	15.4
[1] Percentages based on 175 valid cases.		

Fifteen percent of the respondents reported no relationship with a BC. (See Table 2.6).

The questionnaire was most often filled out by the cooperative's chief executive officer, president or general manager (65.1 percent). The chief financial officer filled out the questionnaire for 24 percent of the respondents, and some other person, usually the

Table 2.7		
Position Held By Survey Respondents		
III.6 What is the position held by the person(s) filling out the questionnaire? (check all that apply)		
Response	Frequency	Percent [1]
CEO, president or general manager	114	65.1
Chief Financial Officer	42	24.0
Both CEO and CFO	3	1.7
Other:_____ [2]	16	9.1

[1] Percentages based on 175 valid cases.
[2] Responses listed under "other" include: vice-president, treasurer, controller, corporate secretary, office manager, and various combinations thereof.

treasurer or controller, did it for 9.1 percent of the respondents. The CEO and CFO collaborated on the questionnaire in 1.7 percent of the cases. (See Table 2.7).

2.3. Lender Survey

2.3.1. Goals of the Survey

The survey of the BC lending staff sought information in three broad areas: 1) on loan pricing and capitalization policies, 2) on the loan decision making process, and 3) on the feasibility of proposed institutions for improving the investment coordination performance of the BCs. Questions in the first area were intended to update information on BC policies since the consolidation of eleven of the banks into CoBank. Questions on the loan decision making process focused on several issues. First, the sequence of steps in the loan decision process was outlined. Second, information was sought on the role of the loan officer and loan committee within the decision making process. Sources of information used in the credit decision were the third aspect of the loan decision process that was examined, including feasibility studies, market intelligence data gathered by the

BCs, information from monitoring borrower accounts, and information gathered from directors. Finally, the survey asked BC officials their opinions regarding industry-based profit centers, a proposed institution for improving investment coordination by the BCs. A copy of the questionnaire for the lender survey can be found in Appendix E.

2.3.2. Survey Design and Implementation

Questions in the survey of BC officials were fairly open-ended, and were designed to facilitate discussion and elicit the opinions of BC management on various credit policy issues.

A total of 9 members of the BC credit staff were interviewed, including the senior credit officers in each of the three banks. The six senior credit officers were initially approached for the interviews with a letter describing the research project and requesting an interview. This was followed up with telephone calls to make arrangements for meeting. Each person was interviewed individually, with the exception of two people at the St. Paul Bank, who requested a joint interview. The meetings with officials at CoBank and the St. Paul BC lasted approximately one hour, and were taped. The interview with a representative of the Springfield BC was conducted over the telephone, and was not taped.

2.3.3. Selection of Respondents

Senior representatives of the credit staff were interviewed at CoBank, the St. Paul BC and the Springfield BC. These people were generally at the senior vice president level in their respective banks and were in charge of credit decision making. They were

identified by other BC officials as those playing a key role in loan decision making or the setting of loan policies.

Chapter 3

A REVIEW OF THE ECONOMIC LITERATURE ON INVESTMENT COORDINATION

This chapter reviews some of the theoretical approaches to understanding and modelling the problem of investment coordination. The theories covered in this chapter are not presented in all their complexity. Rather, an effort was made to pare them down to their essential elements in order to compare models and gain insights into the problem. Where possible, the focus was placed on each model's treatment of the game-theoretic uncertainty inherent in investment decisions.

The chapter begins by reviewing the neoclassical model of industry capacity expansion found in conventional microeconomics textbooks. This is followed by a summary of G.B. Richardson's critique of the neoclassical model of investment and his theory of investment coordination. The third section discusses criticisms of Richardson's arguments and empirical evidence on the relationship between market structure and investment coordination. The fourth section describes the literature on the economics of strategic planning. The fifth section presents game-theoretic models of investment coordination, and the final section discusses the research questions raised by the literature review.

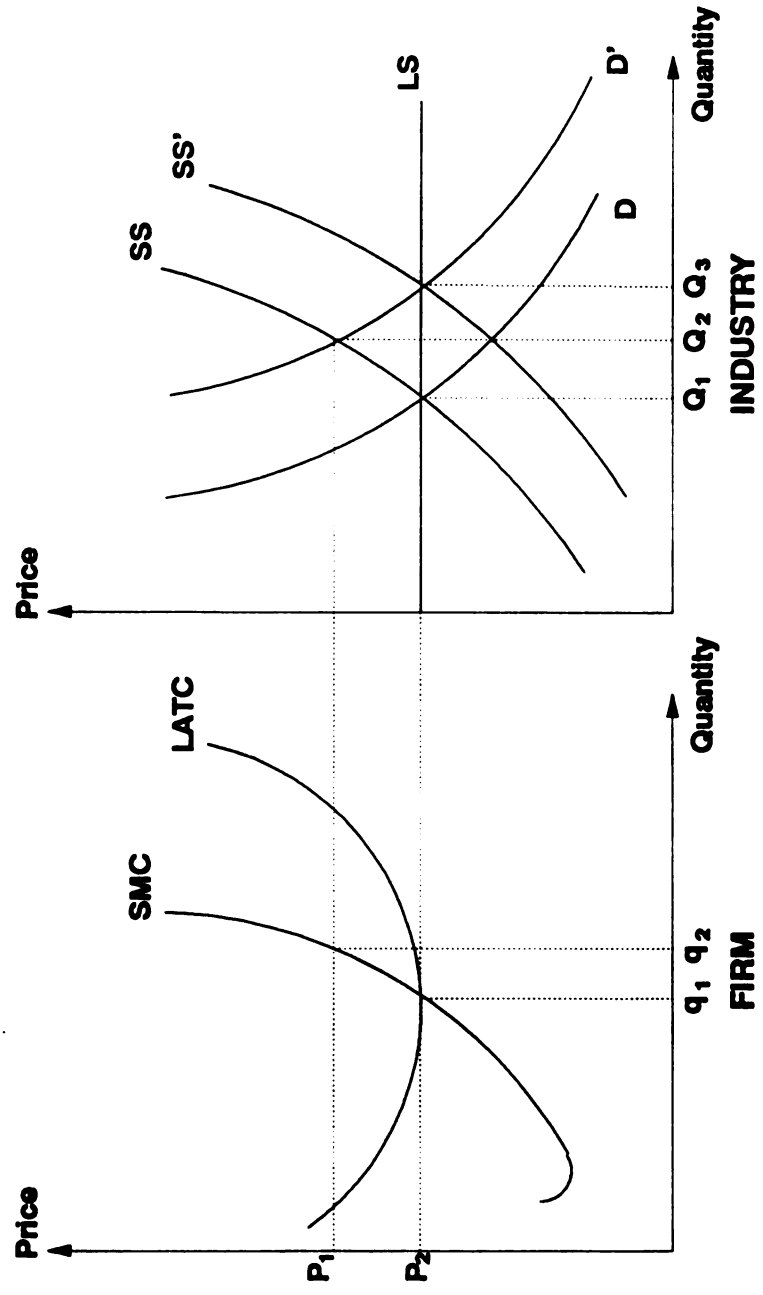
3.1. Neoclassical Theory

In the neoclassical theory of the firm presented in textbooks, there exists a long-run market equilibrium in which every firm in a perfectly competitive industry is required to earn zero economic profits, although in the short run they may earn positive or negative profits. Adjustments in productive capacity are generally explained as follows (Nicholson, 1978).

If demand expands for some commodity, such as wheat, the short run effect will be to increase the market price of wheat. Farmers respond to the increased profitability of growing wheat by increasing output, which involves expanding their productive capacity by undertaking investments in land and/or capital inputs. Figure 2.1 depicts the expansion of capacity in a constant-cost industry in which all firms have identical cost curves. The firm and the industry start out in a position of static equilibrium at q_1 and Q_1, respectively. An increase in industry demand from D to D' causes the price to rise from P_1 to P_2 in the short run. Firms expand production to q_2 to take advantage of the short run profit possibilities. As new firms enter the industry, there is an outward shift of the industry supply curve to SS', causing the price to fall to its initial level. At the new long-run equilibrium, the typical firm again produces q_1, and total industry output is at Q_3. The only difference is that now there are more firms in the industry.

Because of its restrictive assumptions (i.e., perfect knowledge, no transaction costs, etc.), the adjustment of firms to a new equilibrium is instantaneous in the neoclassical model, with prices signalling the immediate movement of resources. The theory ignores the process of adjustment to a new equilibrium, and the role that information, expectations and game-theoretic uncertainty play in the adjustment process. By treating all firms as having identical cost curves and producing at the minimum point of their long-

Figure 3.1: Capacity Expansion in a Perfectly Competitive Industry (Constant Cost Case)



Source: Walter Nicholson, Microeconomic Theory, 2nd ed., p. 328.

run average total cost, the theory also fails to address the allocation of market shares in the expanded industry.

In examining the capacity adjustment process, G.B. Richardson (1960) uncovered a fundamental flaw in this model. He argues that, because a perfectly competitive market structure does not provide expanding firms with the information they need to expand just enough to reach a new equilibrium, the concept of perfect competition should be set aside, both as an explanatory device and as an ideal.

3.2. Richardson's Theory of Information and Adjustment of Industry Capacity

Richardson's central thesis is that it is illogical to believe that a perfectly competitive economy would gravitate toward a general equilibrium of production and exchange, a fundamental presupposition of neoclassical economics. This is because entrepreneurs contemplating investments require information about the investment plans of rival firms, which, if undertaken, will affect the success of their own investments. The availability of adequate information is a function of the form of economic organization or system within which investors operate. Richardson argues that a perfectly competitive economic system does not permit firms to obtain the minimum information necessary to allow them to expand in a manner that will tend toward a long-run equilibrium. In Richardson's analysis, factors that would be called "market imperfections" in a neoclassical framework, such as constraints on managerial access to information about investment opportunities, or limits on access to capital, or even market-sharing arrangements like cartels, become essential environmental and institutional features of the economic system for calling forth appropriate levels of investment.

For example, suppose an industry in a long-run competitive equilibrium suddenly experiences a sustained increase in demand for its product. As in the neoclassical model, in the short run prices rise to clear the market and firms earn positive profits. This signals the need for additional investment, but does not signal how much investment is needed or who should undertake it. If each producer reacts to the new profit potential by expanding capacity, the additional capacity may greatly exceed the increase in quantity demanded. On the other hand, if investors recognize that expansion by others could diminish the potential returns from their investment, they may hold back, resulting in too little investment to satisfy demand and achieve a long-run equilibrium in which firms earn zero economic profits.

Richardson argues that the formation of appropriate entrepreneurial expectations is essential to attain equilibrium, and that a perfectly competitive market structure has no built-in mechanism to convey the information needed to call forth the appropriate amount of investment. Prices are seen to be an inadequate signalling mechanism, as a more comprehensive information system is thought to be necessary to reduce game-theoretic uncertainty. According to Richardson, any theory of investment coordination has to be grounded in a theory regarding the formation of entrepreneurial expectations. He writes in the preface to his book:

> The conventional ways in which we introduce expectations into economic theory...ignore the fact that expectations are based on information, and that the availability to the entrepreneurs of the required information is, in part, dependent upon the nature of the market structure or system of relationships within which they operate.

The issue is to determine the right degree of responsiveness to the right information.

Richardson's analysis of the conditions facilitating successful coordination of investments, i.e., the stable expansion of industry capacity, lays the foundation for asking

what types of economic organization (including banking systems) lead to stable economic growth.

He begins his analysis by distinguishing between two types of investments, competitive and complementary, which require different types of information systems to facilitate their coordination. Investments are classified as "competitive" if the profitability of one firm's investment may be reduced if the investment plans of other firms are implemented. On the other hand, investments are said to be "complementary," or mutually supporting, if the profitability of one firm's investment is increased by the investment of another firm. Coordination of competitive investments may be thought of as horizontal coordination within an industry, and coordination of complementary investments as vertical coordination between industries. Both types of coordination are necessary for the success of a single investment. The volume of competitive investment cannot exceed a critical limit set by available demand, and the volume of complementary investments must reach some minimum level.

An important consideration in the coordination of competitive investments is determining what factors check the response of firms to an increase in demand. One such factor is a firm's knowledge of the investments being undertaken by others. Richardson defines the "transmission interval" as the time it takes for firms to learn about the investment plans of others. The longer the transmission interval relative to the "gestation period," or amount of time between the investment decision and when the goods hit the market, the greater the game-theoretic uncertainty in the investment decision environment. Agriculture is cited as an example of an industry in which the conditions for successful adjustment of capacity are highly unfavorable. All producers make the decision of how much to plant at about the same time, and the transmission interval, or time it

takes to find out how much other firms are producing, is at least at long as the gestation period, which is the growing season. Therefore, knowledge of others' plans cannot act as a check on supply response. As a result, planned coordination takes on an added importance in agriculture.

Many other factors may constrain the adjustment of firms to new demand conditions in an industry. Ignorance, seen as an impediment to ideal economic performance in the neoclassical framework, may actually facilitate investment coordination. By checking the response of some firms, ignorance of investment opportunities may be a necessary condition for any response by others. In Richardson's words:

> A general profit opportunity, which is both known to everyone and equally capable of being exploited by everyone, is, in an important sense, a profit opportunity for no one in particular; it will create the incentive to invest only provided some people are less able to discern it, or to respond to it, than others (p. 57).

Limits to organizational flexibility may also check the ability of firms to expand. Large changes in organization may require additional managerial expertise, which may not be immediately available. "Managerial diseconomies" may limit a firm's ability to quickly respond to new investment opportunities.

Richardson mentions access to credit as another potential constraint on the expansion of capacity. Internally generated funds for increasing capacity may be limited, and access to external financing will be determined by the underlying security value of the firm's assets, as well as the evaluation by the financial markets and banks of the investment project's prospects for success. Firms generally find that external funds can be obtained, beyond a certain point, only at an increasing cost and with the risk of losing control of the firm to outside interests to some extent. Although Richardson acknowledges that limited access to credit is a crucial check on expansion, he did not

develop this idea into an analysis of the role of financial institutions in the capacity expansion process.

To summarize, successful coordination of competitive investments requires restraints on the rate at which firms can gain access to and respond to new information. Richardson argues that these "restraints" should not be thought of as "imperfections," implying that the perfectly competitive market is the ideal to which we aspire. He claims there is some "optimal" level of restraints, which gives a desireable performance result, as defined by system participants. The level of restraints permitting successful adaptation of industry capacity to new demand conditions will vary from one industry to the next. Higher restraints are necessary where production requires a large investment in highly specific fixed assets. Richardson argues that there are even conditions where the adjustment of capacity would be best accomplished by central planning, whether by the government or by the industry itself.

In the coordination of complementary investments, the focus is on how producers obtain assurances that enough investment will be undertaken in adjacent industries to ensure the profitability of their own investments. For example, in the mid-1970s, before corn wet milling firms would invest in the capacity to produce high fructose corn syrup, they required assurances from their potential customers, food manufacturers, that they would make an investment in modifying their production techniques to accommodate the new sweetener (Porter and Spence, 1982). The "restraints" or inertia which provided some degree of predictability for competitive investments are not important to the coordination of complementary investments, which instead should be at some minimum adequate level. Whether complementary investments are excessive is not as important as whether they are sufficient.

Complementarity between various productive activities does not necessarily imply that investment in them will have to be simultaneous and coordinated. The absence of scale economies may mean that small, incremental additions to existing capital stock are possible, in which case markets may effectively coordinate complementary investments. More explicit coordination may, however, be necessary if firms in one industry are not willing to expand without assurance of the expansion of others. The increase in capacity in input industries many have to be sufficiently large, appropriately timed, and available at a certain price. Assurance of complementary investment may be obtained through contracts, varying degrees of vertical integration, or, especially in developing countries with poorly developed manufacturing sectors, through central planning. In the latter situation, the smaller the manufacturing sector of a country, the smaller the number of user firms able to absorb an increase in the output of, say, steel. Because complementarity is stronger than in a more highly developed economy, price may be inadequate as a coordinating mechanism.

The coordination mechanisms which develop will assume different forms according to whether the complementary group of firms is large or small. The smaller the group, the greater their interdependence, and thus the greater the need for information and explicit guarantees regarding the actions of others. However, coordination of complementary investments is unlikely to ever be complete, because actions that firms take to reduce uncertainty, such as contracting to purchase inputs, also reduce their flexibility. One source of uncertainty may be reduced, but it may leave the firm less able to adapt to the remaining uncertainty.

(In examining the role of the BCs in investment coordination, the primary focus will be on the coordination of competitive investments, because the banks have the

greatest role to play in situations in which communication between firms is impeded, for example, when they are competing. The game-theoretic models presented below represent the coordination of investments within, rather than between, industries. However, the distinction between competitive and complementary investments is not always a neat one. Complementary investments for one borrower are competitive investments for another).

Richardson's main point is that, in an uncertain and ever-changing world, both competition and planning are necessary to achieve coordination of investments and thus stable economic growth. He argues that the perfectly competitive model, which often guides our perception of economic phenomena, as well as our policies addressing them, is constructed to tell only part of the story, that of competitive markets, while neglecting the role of planning institutions in reducing uncertainty in the investment decision environment.

3.3. Criticisms and Empirical Testing of Richardson's Theory

F. M. Scherer (1980) takes issue with Richardson's assertion that market "imperfections" are essential for the economy to respond to demand changes with the correct amount of investment. He particularly challenges Richardson's idea that price-fixing agreements and market-sharing cartels are conducive to the orderly expansion of industry capacity. Scherer argues that collusive arrangements may be as likely to destabilize investment as to stabilize it. When price-fixing schemes encourage heavy investment by outsiders and incumbents invest in more efficient techniques to keep costs low enough to compete, capacity may be greatly expanded. If the cartel subsequently collapses because outsiders are supplying a growing share of the market, prices will plunge

and disinvestment may occur. Moreover, oligopolistic market-sharing agreements are inherently unstable. The incentive to cheat on production quotas may lead companies to invest in more capacity than they need, recognizing that a firm's bargaining power within the cartel depends on the amount of output it can potentially dump on the market. An empirical question thus arises concerning what market structures serve as effective investment nomination mechanisms.

In a 1969 article, Scherer used annual data on new capital investment for 70 U.S. manufacturing industries to test whether investment instability was related to various industry characteristics. He found that investment was more unstable in durable goods industries, relatively small industries, and relatively capital-intensive industries. He also found investment variability to be greater in concentrated than in atomistic industries. However, it was unclear whether this greater instability was the result of the lower dispersion of decision making power in concentrated industries or their excessive sensitivity to demand stimuli. The results did not support Richardson's argument that industry concentration might have stabilizing properties.

In a 1973 extension of his 1969 paper, Scherer included a variable in his model measuring the plant scale economies to gain some insight into the observed relationship between industry concentration and investment variability. Based on Richardson's critique of his 1969 study, Scherer hypothesized that investment was more variable in concentrated industries for technological reasons, i.e., because concentrated industries tend to be those in which investment has to take place in discrete lumps due to scale economies, which translate into plant indivisibilities. He found the plant lumpiness variable to be statistically insignificant in explaining investment instability, lending support to the interpretation that investment instability is due more to the low disperson of decision making power in

concentrated industries than plant scale economies. This finding suggests that more research attention should be given to the direct role of information and expectations in the capacity expansion process, rather than to structural or technological factors.

A problem with Scherer's work concerns his choice of dependent variable. Investment instability, while it may be a symptom of poor investment coordination, is not the same thing. Scherer does not address whether instability is an indicator of mistaken investment decisions or a factor contributing to investment mistakes.

The differential responsiveness of firms to information regarding profitable investment opportunities was essential to the coordination of competitive investments in Richardson's analysis. Frances and Louis Esposito (1974) examined whether differing reactions to demand changes affect the level of excess capacity carried by industries of varying degrees of concentration at different stages of the business cycle. Examining 35 3-digit manufacturing industries, they found that medium oligopolies (those with a four-firm concentration ratio between 40 and 69) reported more excess capacity than either highly concentrated or atomistically structured industries coming out of the trough of a business cycle. Highly concentrated industries (those with a CR_4 greater than 70) held the least excess capacity. Using basically the same data, Mann, et al. (1978) found that when business conditions were improving, highly concentrated industries adjusted their actual levels of capacity utilization to desired levels more quickly than did less concentrated industries.

Subsequent empirical research moved in the direction of examining excess capacity as a strategic barrier to entry. The focus was more on the behavior of firms in oligopolistic industries than on the coordination of investments, per se. (See, for example, Caves, et al., (1979); and Leiberman, (1987)).

Richardson's theory regarding the role of information in industry expansion shifted the focus of attention from the assumed instantaneous adjustment of industry capacity to a new equilibrium in the neoclassical model to the process whereby entrepreneurial expectations are formed and acted upon. However, the empirical studies that resulted from his work emphasized the structural conditions associated with successful investment coordination, rather than the information flows that actually facilitate it. A more recent body of literature on the economics of strategic planning begins to address this topic. The strategic planning literature attempts to explain firm-level strategic decisions, especially the decision to expand capacity.

3.4. The Economics of Strategic Planning

There have been several schools of thought in the area of the economics of strategic planning. Thomas (1986) divides this area of study into three broad approaches. The corporate strategy paradigm of the Boston Consulting Group (BCG) emphasized the experience curve of the firm, the product life cycle, and balanced portfolio growth as the key factors in explaining the strategic behavior of corporations. The BCG approach, however, has been criticized for its conception of competition as entirely cost-based, and for its over-emphasis on the simplistic "growth-share matrix" as a way of explaining how firms position themselves within and across industries.

The second major analytical framework for explaining corporate strategy grew out of the structure-conduct-performance paradigm of the Harvard School of Industrial Economics. They view the source of competitive advantage as monopoly, and explain corporate strategies as actions to attain monopoly profits. Michael Porter's five-forces model is probably the most widely known exposition of the Harvard School. It holds that

five forces determine the ability of firms to position themselves to gain monopoly profits: the threat of new entrants, the bargaining power of a firm's suppliers, the bargaining power of its customers, the degree of rivalry among existing firms, and the threat of substitute products or services. Firms try to adopt strategies to minimize their exposure to the five forces in order to maximize their profitability.

Several criticisms of the traditional Harvard approach, particularly its use of concentration as a clumsy proxy for firm market share in explaining profits, led to a new articulation of the Harvard paradigm, emphasizing strategic rather than structural barriers to competition. In this framework, one of the most important strategic barriers to competition is pre-emptive investment in capacity. Existing firms collude to maintain prices and to overinvest in capacity. Potential entrants, recognizing that their entry could create severe oversupply, are credibly deterred.

The capacity expansion decision is thus central to the new Harvard school's analysis of corporate strategy. (Michael Porter's discussion of the capacity expansion decision was presented in Chapter 1). Although this literature does not emphasize the coordination of investment in a macro sense, i.e., it is narrowly focused on the welfare of firms, and not consumers or society at large, it does illuminate several key aspects of firms' decisions to expand capacity, most importantly, the game-theoretic uncertainty inherent in investment decisions. A case study of the corn wet milling industry by Porter and Spence of Harvard Business School (1982) provides particularly useful insights into how firms deal with game-theoretic uncertainty in the capacity expansion process, and lays the foundation for using game theory to model the capacity expansion decision.

The commercial introduction of high fructose corn syrup (HFCS) in 1972 threatened to disrupt the corn wet milling industry for the second time in a decade. The

industry had been a stable oligopoly for several decades, but was disrupted by the entry of three outside firms, all large-scale processors and traders of commodities, in the 1960s and early 1970s. This was a period of intense industrial warfare and price competition. By 1972, capacity utilization levels were back to normal and eleven firms comprised the industry, when they were faced with another major upheaval: the decision of whether to invest in HFCS capacity.

HFCS, a commodity product, is a corn syrup with a very high degree of sweetness. It is made by the further processing of regular corn syrup, which, along with corn starch, is the product of the corn wet milling process. HFCS is a substitute for sugar in manufactured foods, particularly soft drinks.

Firms deciding whether to invest in HFCS capacity faced a number of very complex issues. First, they faced uncertainty with regard to the expected level of demand for the product and the rate at which users would convert from sugar to HFCS. The second major issue facing corn wet millers in deciding about HFCS capacity was how to make the investment. A firm could enter the HFCS market by diverting regular corn syrup capacity into HFCS production or by building new capacity. For the individual firm, the profitability of its decision to build HFCS capacity depended on two factors: 1) the evolution of demand for the product, and 2) the capacity expansion decisions of competing firms.

Porter and Spence sought to model the capacity expansion process in this industry by hypothesizing that firms go through the following five steps when making investment decisions. First, the potential demand for HFCS over the lifetime of the investment was evaluated using a number of probabilistic scenarios reflecting various projected sugar prices and HFCS adoption rates.

Second, a range of possible industry expansion paths was identified. They examined three capacity expansion scenarios (high, medium and low capacity) during the initial years of the project's lifetime, expanding this to nine scenarios in the later years. Analyzing these scenarios involved making assumptions about the conversion of existing facilities to HFCS production, as well as investment in new facilities. The production capacity (in billions of pounds of HFCS) was projected for each year of the planning horizon.

Third, Porter and Spence evaluated the effects of a number of expansion strategies on the profitability of each firm in the industry. The analysis of profitability was done for each of six possible expansion strategies available to the firms, ranging from doing nothing to converting one existing plant and adding two greenfield plants. The profitability of each strategy was conditioned upon the industry expansion scenarios identified in the second step of the analysis, as well as the various demand and sugar price scenarios identified in the first step. The demand and industry expansion path scenarios were translated into forecasted product prices and capacity utilization rates, both for HFCS and the markets for starch and corn syrup. These forecasted prices were used to compute a large matrix of potential payoffs from different capacity expansion scenarios and investment strategies for each firm in the industry. (See table 3.1 for an example of the payoffs for one of the firms in the industry). The matrices summarize for each firm the financial implications of combinations of their own strategies and the aggregate behavior of rival firms, but do not say, without further analysis and assumptions, what that behavior will be.

In the fourth step, the authors determine what the strategic decisions of the firms are likely to be. The expansion strategy chosen by each firm will depend on its

Table 3.1

Matrix of Payoffs from Various Investment Strategies and Industry Capacity Scenarios for a Sample Corn Wet Milling Firm

				American Maize (SCENARIO)					
				1	2	3	4	5	6
CONVERT		EPDV		105.705500	75.255425	217.756630	182.672950	173.048920	135.495980
		SD		71.981062	65.431276	71.093882	66.468371	89.484487	87.192668
1 MES		PVMAX	1	198.333480	162.297080	349.481220	309.750970	283.889000	245.947760
		PVMIN		4.476030	0.116301	68.503765	38.140455	31.061796	7.117709
		CUMMIN		3.549640	-2.405120	6.220000	6.220000	6.220000	5.220400
1 MES		EPDV		79.635483	29.452691	200.889430	137.700330	160.947510	97.114125
		SD		71.378952	55.959538	65.547177	56.377765	90.911728	82.280129
GREENFIELD		PVMAX	2	167.651350	103.242940	312.710510	242.147750	269.246390	199.005200
		PVMIN		-34.802979	-38.351336	64.695863	15.305580	3.371634	-32.323563
		CUMMIN		-38.057260	-43.119520	-9.780000	-19.560000	-19.667100	-36.565000
3 MES		EPDV		108.821170	48.844504	344.982830	278.217410	276.928860	205.004730
		SD		145.321180	130.863460	159.930710	149.405060	188.716410	183.418720
		PVMAX	3	289.143670	217.614600	642.741430	564.714320	492.296260	420.162360
	(STRATEGY)	PVMIN		-116.096120	-126.003580	14.790971	-46.728548	-63.089955	-108.882100
		CUMMIN		-129.340860	-143.635140	-27.780000	-104.274800	-105.774200	-125.135400
1 MES		EPDV		92.999119	42.816327	214.253070	151.063970	174.311150	110.477760
Add-on		SD		71.378952	55.959538	65.547176	56.377765	90.911727	82.280129
		PVMAX	4	181.014980	116.606570	326.074140	255.511390	282.610020	212.368840
		PVMIN		-21.439344	-24.987700	78.059499	28.669217	16.735271	-18.959928
		CUMMIN		-24.057260	-29.119520	-2.780000	-5.560000	-5.667100	-22.565000
2 MES		EPDV		98.606624	43.158096	287.353180	221.269520	229.517370	161.243990
		SD		108.673140	93.723911	117.969270	108.016980	146.598950	139.777450
		PVMAX	5	233.278700	164.941160	501.784850	426.383520	402.278100	330.647990
		PVMIN		-71.462323	-78.559036	45.627756	-10.933550	-25.351020	-66.503490
		CUMMIN		-77.334520	-87.490440	-27.780000	-55.560000	-55.774200	-74.350000
DO NOTHING		EPDV		74.029977	29.110922	127.769120	67.494701	105.741290	46.347896
		SD		54.371060	18.930135	16.805031	6.898351	36.015186	25.834557
		PVMAX	6	115.360630	54.908348	136.999800	71.275620	149.578310	80.726034
		PVMIN		15.228000	15.228000	97.127004	54.908348	45.457924	15.228000
		CUMMIN		15.228000	15.228000	15.228000	15.228000	15.228000	15.228000

Note: EPVD = expected value of the present value of net cash flows from the investment
SD = standard deviation of the present value of the cash flows
PVMAX = the maximum present value across demand scenarios
PVMIN = the minimum present value across demand scenarios
CUMMIN = the smallest cumulative cash flow for any demand scenario for any year (measures the financial resources the firm will have to mobilize if market demand is weak).

Source: Porter and Spence, 1982, p. 295.

expectations of what rivals will do, as well as their risk preferences, financial resources, past corporate policies, and other factors. Porter and Spence hypothesize that there is some anticipated pattern of capacity expansion that will result when intelligent rivals converge in their expectations about each others' behavior. In other words, the equilibrium pattern of capacity expansion is that which results from the predicted capacity decisions of industry participants, whose decisions are in turn conditional on anticipated industry capacity. The hypothesized equilibrium outcome is thus the one that, when expected by firms in the market, will lead to capacity expansion decisions which in the aggregate add up to the outcome contained in the original hypothesis. This is consistent with the concept of a Nash equilibrium in game theory, which will be discussed in greater detail below.

Fifth, once Porter and Spence determined what decisions firms in the industry were likely to take, they asked which of the capacity expansion scenarios identified in step 2 was most consistent with the sum of the capacity expansion decisions of the firms. In this manner, the evolution of industry capacity is predicted, as well as the associated strategic decisions for each firm in the industry.

From their modelling exercise based on data and expectations prevailing in 1972, Porter and Spence found the equilibrium expansion path to be the medium capacity, high-conversion scenario, which had the required consistency property, i.e., the predicted behavior of the firms was close enough to the initial hypothesis to be an equilibrium. The other five capacity expansion scenarios generated firm behavior that was not consistent with the assumed scenario underlying the behavior. Table 3.2 shows how the equilibrium expansion path was identified. Comparing their analysis to what actually happened in the industry, the authors found the equilibrium expansion path suggested by the modelling

Table 3.2

Identification of the Equilibrium Expansion Path of the Corn Wet Milling Industry

Firm Strategies in HFCS, Conditional on Assumed Industry Capacity Expansion and Conversion Scenarios

	Assumed Capacity					
	High		Low		Medium	
	Low Conversion (25%)*	High Conversion (0%)*	High Conversion (25%)*	Low Conversion (0%)*	High Conversion (25%)*	Low Conversion (0%)*
Company:						
American Maize	Convert	Convert	1 add-on + 1 greenfield	Convert	1 add-on	Convert
Anheuser-Busch	Convert	Convert	1 add-on	Convert	Convert	Convert
Archer-Daniels-Midland	Convert	Convert	1 add-on + 2 greenfields	1 add-on + 1 greenfield	1 add-on + 2 greenfields	1 add-on + 1 greenfield
Cargill	Convert	Convert	1 add-on + 2 greenfields	1 add-on + 1 greenfield	1 add-on + 1 greenfield	Convert
CPC International	Convert	Nothing	1 add-on + 1 greenfield	1 add-on + 2 greenfields	Convert	Convert
Grain Processing	Nothing	Nothing	Convert	Convert	Convert	Convert
Hubinger	Nothing	Nothing	Convert	Convert	Convert	Convert
Pennick & Ford	Nothing	Nothing	Convert	Convert	Convert	Convert
Staley	Convert	Convert	1 add-on + 2 greenfields	1 add-on + 1 greenfield	1 add-on + 1 greenfield	Convert
Standard Brands	Convert	Convert	1 add-on + 2 greenfields	1 add-on + 1 greenfield	1 add-on + 1 greenfield	1 add-on + 1 greenfield
Implied outcome	7MES = 2,499M lbs. 100% conversion	6MES = 2,142M lbs. 100% conversion	20MES = 7,104M lbs. 15% conversion	16MES = 5,712M lbs. 31% conversion	14MES = 4,998M lbs. 28% conversion EQUILIBRIUM	12MES = 4,284M lbs. 66% conversion

*Amount *H* from conversion.

Source: Porter and Spence, 1982, p. 280.

process to be reasonably accurate. However, they acknowledge that the actual choices made by the firms in the industry may not have been based on this type of analysis. Porter and Spence investigated how capacity expansion decisions might have been made under a series of plausible assumptions, not how they actually were made.

Porter and Spence observed that the degree of uncertainty, both with regard to demand (primary uncertainty) and the expansion decisions of competing firms (secondary or game-theoretic uncertainty), is the primary determinant of the equilibrium expansion path of an industry. When demand for a product is certain, the capacity expansion process becomes a race by firms to expand first and gain a dominant industry position. Preemptive capacity expansion becomes the dominant strategy for each firm in the industry. However, if many firms make preemptive expansions and fail to deter other firms from expanding, then massive overcapacity will result. Thus when there is no primary uncertainty, game-theoretic uncertainty assumes even greater importance. They extend this line of reasoning to speculate that an industry which evolves in an environment of uncertain demand is likely to end up less concentrated that one which faces certain demand, because certain demand will lead to competitive warfare, the exit of firms, and potential high concentration.

However, the authors admit that the relationship between demand uncertainty and industry structure is probably more complicated than that. They hypothesize that concentration may be a U-shaped function of demand uncertainty. As uncertainty about demand increases, existing firms reduce planned investment. This would have the effect of making the industry more attractive to potential entrants, causing industry concentration to fall. However, at higher levels of demand uncertainty, the market becomes less attractive to the more risk-averse firms, and industry concentration may rise. Firms'

perceptions of the level of demand uncertainty they face are a function of how their expectations are formed. Porter and Spence observe that all the firms in an industry are likely to obtain information about future demand prospects from common sources, which may cause their expectations to converge and an equilibrium expansion path to result. The common information sources include the pool of prospective customers, the capital markets, public statements by industry participants, and actual decisions to commit resources.

Capital markets play an extremely important role in the creation of expectations. Security analysts develop predictions of future demand that are published and widely read by the firms in an industry. These analysts rely heavily on interviews with industry participants as a source of information, so they provide a mechanism for firms to circulate predictions and thereby for expectations to converge. Security analysts act as filters through which signals are passed from firms to the rest of the industry, and may create an optimistic bias in the expectations of industry participants.

Porter and Spence point out that there seems to be a bias among managers toward optimistic expectations of the returns to capacity expansions. This bias may lie in the manager's reluctance to make decisions that go against what the rest of the industry seems to be doing. If he or she chooses not to expand capacity when competitors do and demand proves to be high, the incorrect decision will be difficult to explain. On the other hand, if he or she expands along with competitors and demand proves to be low, then blame can be shared or attributed to the behavior of other industry participants. Porter and Spence term this the "bandwagon effect." They suggest that once a few industry leaders have announced capacity expansions, the bandwagon effect will induce many firms

to rapidly announce capacity additions. This effect may be reinforced by the capital markets if security analysts hold optimistic expectations of future industry demand.

Although the bandwagon effect mitigates the tendency toward industry concentration by creating expectations that lead to a high capacity equilibrium, it may also contribute to instability. If the bandwagon effect is present, then a strategy of preemptive capacity expansion by one or more firms could result in severe excess capacity.

The main contribution of Porter and Spence's corn wet milling study was that it directly focused on the links between information, expectations, and the evolution of industry structure. The relationship between primary and game-theoretic uncertainty was addressed, as was the role of capital markets in the formation of expectations. Their main point was that it is possible to calculate the most likely capacity decisions for firms in an expanding industry, based on the assumption that firms will come to a common view about each others' decisions. The resulting equilibrium expansion path is consistent with a Nash equilibrium in game theory.

In a critique of the corn wet milling study, Sidney G. Winter (1982) notes that the equilibrium concept employed by Porter and Spence is quite different from the highly stylized equilibrium in neo-Walrasian theory, in which price flexibility guarantees that factor and product markets always clear and a general equilibrium results. In the analysis of the corn wet milling industry, prices do not sustain equilibrium, they signal disequilibrium. Firms' responses to disequilibrium are imperfectly coordinated by a variety of non-price information flows and by actors' expectations of each others' behavior. The results of their actions are reflected in prices only when it is too late to reconsider the actions taken. All the players of the game need to know as much as possible about their

rivals' situations. As Winter puts it, "In the Porter and Spence account, all firms are performing the functions of the commissar for corn wet milling." (p. 314).

The plausibility of their argument that a single equilibrium (in the Nash sense) expansion path would result depends on a number of industry characteristics. In corn wet milling, the list of actors is relatively short, and they draw on a large pool of shared information about each other. They also share a common fund of information sources about demand conditions, and security analysts independently judge demand prospects for the industry as a whole. These conditions, along with firms' ability to communicate through public statements, facilitated a stable expansion of capacity in corn wet milling. However, to the extent that these conditions are not present in other industries, it may be unreasonable to assume that a single equilibrium expansion path can be identified prior to firms' investment decisions. Winter offers as an alternative explanation a scenario in which historical market shares would play a greater role in determining firms' capacity expansion decisions.

Winters notes that in both his and Porter and Spence's explanations of the capacity expansion process, what firms need to coordinate their behavior is a focal point (Schelling, 1960). Focal points are Nash equilibria which for psychological reasons are particularly compelling (Rasmusen, 1989). When multiple equilibria are possible, i.e., firms may choose from a number of industry expansion paths, which is most likely to be chosen? Reports by security analysts, historical market shares, and other factors influencing expectations may provide focal points causing the outcome of the game to converge on a single equilibrium.

The corn wet milling study provides a practical example of capacity expansion decision making and introduces some of the basic concepts that will be developed more

formally in the next section, which examines the use of game theory to model capacity expansion decisions.

3.5. Game-Theoretic Approaches to Modelling Investment Coordination

Game theory is particularly appropriate for modelling the investment coordination problem because it directly addresses two characteristics of economic decision making that more traditional techniques of analysis ignore: 1) the interdependence of individuals' economic decisions, and 2) the uncertainty in their decision environment. Game theory is concerned with the actions of individuals who are aware that their actions affect each other. It also involves the kind of uncertainty that is caused by not knowing what the other players are going to do. These are fundamental characteristics of capacity expansion decisions.

The basic technique of game theory is to specify the elements that describe a game. These elements include players, actions, information, strategies, payoffs, outcomes, and equilibria. The objective of the modeller is to use these essential elements, collectively referred to as the rules of the game, to predict the outcome of a particular decision making situation involving a number of interdependent actors.

Games in general are divided into two basic categories: 1) cooperative games, in which players can communicate with each other and make binding commitments, and 2) non-cooperative games, in which they cannot. The fundamental difference between the two types of games lies in the solution concept imposed, not in the presence or absence of conflict. Investment coordination will initially be treated as a non-cooperative coordination game. The models discussed here attempt to explain the outcome of a

decision situation in which the firms in an industry are unable to communicate with one another in order to adopt mutually beneficial investment strategies.

3.5.1. Game-Theoretical Representation of Coordination Problems[1]

In game theory, a coordination problem is a type of non-cooperative game in which players have an incentive to coordinate their actions in order to avoid inferior or less-preferred outcomes. However, despite the incentive to coordinate, players are also in conflict over which strategy to choose, because different strategies benefit one player over the others. Although players cannot communicate with one another, they can only achieve the highest payoffs if they act in concert. The intellectual process of a player in a coordination game involves more than just predicting what the other players will do. Tacit coordination involves predicting what they will predict about what you will predict about what they will do, etc... Complicating this process of coordination for common gain is the fact that there is rivalry among alternative common courses of action.

In more formal terms, Schotter (1981) states that a coordination problem exists "if the payoff space of the game...is such that at any equilibrium point, not only does no player have any incentive to change his behavior, given the behavior of the other players, but no player wishes that any other player would change either" (p.22).

This can be illustrated by considering the payoff matrix of a game of coordination between two players (A and B), who must choose between strategies 1 and 2 without communicating with each other.

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[1] In the discussion of game theory that follows, players are exclusively described with the masculine pronoun. This is done simply to facilitate exposition and does not imply that all players are or should be men.

A \ B	1	2
1	6,4	0,0
2	0,0	3,7

The outcomes (6,4) and (3,7) are two Nash equilibria in this game, because neither player will want to deviate from these choices. If player B believes that player A will choose action 1, with a payoff of 6, player B has no incentive to deviate from it, because his choice is between action 1, with a payoff of 4, and action 2, with a payoff of zero. On the other hand, if player B believes that player A will choose action 2 with a payoff of 3, player B will also choose action 2, because the payoff of 7 is greater than zero.

However, coordinating strategies is problematic in this non-cooperative game, because the players cannot communicate with each other and make agreements about which strategy to choose. Coordination is made more difficult by the fact that, while the players' preferences are locally parallel (i.e., if player A chooses action 1, player B will also prefer it), they are globally divergent (if player B believes player A chose action 1, player B will go along with it, even though he would prefer player A to choose action 2, which gives him a payoff of 7 instead of 4). In other words, the incentive structure of the game is such that while players have an incentive to coordinate their strategies, they are not indifferent as to which strategy they settle on. In a coordination game, neither rival can gain from outsmarting the other. Each player loses unless he does exactly what the other expects of him.

In the game theory literature, coordination problems are generally classified into two basic categories. In the game described above, players have incentives to coordinate but also have divergent interests. Economists often simply refer to this as a "coordination problem" or "the Battle of the Sexes" after a popular textbook example, but Schelling denotes it by the more descriptive term "mixed motive coordination game."

Another type of coordination problem exists in which players gain from coordinating their actions, but the conflict over which equilibrium outcome to choose is not present. Coordination games of this type are generally referred to as games of "pure coordination." They can be seen as a special type of coordination problem in which there is no conflict among the players over which of potentially many equilibrium outcomes to choose. The distinction between mixed motive coordination games and games of pure coordination is important in evaluating the outcome of the games, particularly for their characteristics of stability and convergence on a single equilibrium, which will be discussed in greater detail below.

Staatz (1984) provides an example of a coordination problem faced by farmer cooperatives which illustrates the difference between mixed motive and pure coordination games. This example involves the harmonizing of farmers' production schedules in order to permit fuller use of processing plant capacity. If all members of a farmer-owned cooperative processing plant deliver their product to the plant on the same day, there may be more produce there than the plant can handle, and some product losses may occur due to spoilage.

The classical solution to a coordination problem is to develop a rule which specifies how each player must behave in specific situations. (Other solutions to coordination problems will be discussed in greater detail in section 2.5.3 below). In this

example, a rule solving the coordination problem would be a production contract between the cooperative and the farmer specifying exact delivery dates. The rule would aid the players in achieving a higher payoff by providing them with a stable set of expectations regarding how their cohorts will behave and thus inducing them to coordinate their actions with each other.

The type of coordination problem it is (pure or mixed motive) is reflected in the structure of the payoffs to the various participants. This will influence the ease with which a rule may be established. In a pure coordination problem, the payoff matrix is symmetric, i.e. all players are indifferent to which equilibrium is the outcome. In the case of farmers delivering their produce to a processing plant, the following matrix depicts the pure coordination game.

		Grower 2	
		Deliver Aug. 10	Deliver Aug. 20
Grower 1	Deliver Aug. 10	45,45	60,60
	Deliver Aug. 20	60,60	45,45

If a farmer is the only one delivering produce to the plant on a given day, his returns are higher ($60) because the plant can quickly handle his produce. If both farmers deliver on the same day, delays in handling and the resulting spoilage mean that both receive lower returns ($45). The incentive to establish a rule regarding the delivery date is clear cut because both farmers receive the same amount of benefits from coordinating delivery.

Establishing a rule to make behavior more predictable is more difficult when the game has a non-symmetric payoff matrix, i.e., when it is a mixed motive coordination game, which is the more common case. When the payoff matrix is non-symmetric, there is an advantage to choosing one action over another. When the above game has a non-symmetric structure of payoffs, there is a distinct advantage to delivering on a certain date.

		Grower 2	
		Deliver Aug. 10	Deliver Aug. 20
Grower 1	Deliver Aug. 10	45,45	65,58
	Deliver Aug. 20	58,65	42,42

The players will still seek stable expectations of others' behavior so as to avoid non-equilibrium outcomes; however, unlike the pure coordination case, different rules imply different distributions of welfare. Conflict over the adoption of rules that influence outcomes is built into the mixed motive game, while commonality of interests is built into a pure coordination game. Staatz posits that the rule that is finally established will reflect the distribution of power among the players.

There are many economic applications of coordination games. These include the choice of an industrywide standard when two firms have different products but want to encourage a common standard in order to induce consumers to buy a product. This situation has occurred in markets for computer software and hardware, telecommunications equipment, videocassette recorders, and a number of other products

(Farrell and Saloner, 1988). Coordination problems are very common, particularly in situations where competing firms would gain by acting in concert, but are prevented from communicating their plans to each other by competitive or antitrust considerations. The coordination of investments in industry capacity is another application of this type of non-cooperative game.

3.5.2. A Simple Model of Investment Coordination

This section examines a simple model of investment coordination. It captures the essential elements of the investment coordination problem in a more formal mathematical game. It is drawn from an article by Joseph Farrell entitled "Cheap Talk, Coordination and Entry" (1987). Farrell begins the modelling process by asking the question that his model seeks to answer: When a number of firms contemplate entering an industry that can profitably accommodate only some of them, how many of them will enter? The neoclassical response to this question is that just enough enter so that the addition of one more would cause all (or at least the last entrant) to lose money. However, this assumes that firms decide sequentially whether to enter. While this may occur in some markets, in others, the entry decisions of firms may be simultaneous. Farrell's model seeks to explain how investment coordination might be achieved in such a situation.

Dixit and Shapiro (1986) addressed the same investment coordination question. However, they used a game in which firms can revise their entry decisions if too many or too few firms enter the market. Farrell argues that Dixit and Shapiro's model of reentry and reexit is unconvincing when there are substantial sunk costs involved in entering a market.

In industries where investment decisions are irreversible (true of most industries), firms often announce "plans" to enter or not well in advance of the final investment decision. Farrell analyzes a stylized model of these announcements, with the goal of understanding when and to what extent they aid in investment coordination.

Farrell's basic model is a coordination game in which two firms are contemplating entering a natural-monopoly market. The market is seen as a natural monopoly because there is only room for one of the two firms. Each firm may choose between two strategies, "in" or "out." The payoffs to the firms from the different strategies are given by the following matrix.

		Firm 2: In	Firm 2: Out
Firm 1	In	-L,-L	M,B
	Out	B,M	0,0

If both firms enter a market that can only support one of them, each loses -L. If neither firm enters, neither earns any return from this market. If just one firm enters, it earns profits of M, while the other firm receives a surplus of B, which is a positive number but less than M.

In constructing this payoff matrix, Farrell made a critical assumption that each firm prefers, if it does not enter, that the other should enter. If this were not true, i.e., if B were equal to zero, then the dominant strategy for each firm would be to do nothing. The

assumption is necessary to make the structure of the game a mixed motive coordination problem. Farrell justifies this assumption by claiming that entrants into a new market are often established firms in the market for a complementary good, for example, a computer manufacturer may consider entering the market for software. Because of the complementarity of their products, the firms do not want to see the new market unserved. In reality, B might be negative, if the two firms were directly competing and investment by one caused the other to lose market share. This somewhat artificial assumption, while crucial to the final results of his model, does not inhibit use of the model here for purposes of simply explaining the dilemma facing firms deciding simultaneously and without communication whether to enter a market.

This game has two pure-strategy equilibria. In one, firm 1 plays "in," earning a return of M and firm 2 plays "out," earning a return of B. In the other equilibrium the roles are reversed. (There is also a mixed strategy equilibrium, in which the players choose randomly between the pure strategies based on the probabilities associated with the other player's choices. This mixed strategy is important to Farrell's analysis of the role of cheap talk). The problem facing the players in this game is to choose a strategy without knowing what the other player will choose. Incentive to coordinate is built into the game, in that both firms can gain as long as one of them enters, but conflict is also built in, because returns are highest to the entering firm in each of the pure strategy equilibria. However, if both firms act in pure self-interest and choose the strategy that yields them the highest payoff (i.e., entering), they both lose.

In a situation like this, some coordinating device is necessary to ensure that the firms do not both make the decision to enter. Farrell examines the effect of costless announcements, or "cheap talk," on the firms' decisions. He begins by discussing two ways

of modelling the effect of announcements. One approach would be to suppose that false announcements (those which are not followed with the corresponding action) are costly. For example, a firm could lose credibility in the future if it sent a false signal. As long as false announcements are costly, firms would signal only their true intentions. This approach was used by Dixit and Shapiro in their 1986 article. Farrell uses an alternative approach, assuming that announcements are "cheap talk." In other words, announcements have no direct costs or benefits and do not directly affect payoffs.

There is one possible equilibrium in which announcements would not affect the outcome, i.e., if everyone believes that cheap talk will be ignored, they will make announcements that do not correlate with their actions, and then all players' disregard of announcements will be justified. However, another possible equilibrium would result if players announced their plans, and then followed them. If it became a convention that everyone expected such equilibria to be followed once announced, then cheap talk can help coordinate behavior in this type of game.

Farrell focused his analysis on the symmetric mixed strategy equilibrium of a game in which firms were allowed to make a number of announcements, after which they had to choose to enter or not. In Farrell's equilibrium, the firms achieved a higher level of coordination (i.e., it was more likely that exactly one firm would enter) than in the symmetric equilbrium of a game without communication (e.g., the game analyzed by Dixit and Shapiro). He found that as the number of rounds of communication increases before the final entry decision is made, coordination improves. However, because the payoff structure of the game is such that each firm wants to be the entrant, some coordination failures will still remain. He found that the conflict inherent in the game prevents even unlimited communication from achieving perfect coordination.

Farrell's basic model illustrates a situation in which, in the absence of communication or some other type of coordinating mechanism, the chances for effectively coordinating the entry of two firms into a market that can only support one are extremely slim. The next section considers a number of coordinating mechanisms that may facilitate favorable outcomes of various coordination problems.

3.5.3. Determining the Outcome of Coordination Problems

Once a game has been formally described in terms of players, their preferences, possible actions and outcomes, some solution rule is necessary to investigate whether the behavior of players in a particular game will lead to stable equilibria. Staatz (1984) notes that different solution concepts lead to different allocations of payoffs among players, so each solution concept embodies a different concept of fairness. (This will be an important consideration in the discussion presented in the next section on the development of institutions for solving coordination problems). Although there are several different solution concepts for cooperative games, for non-cooperative games, including coordination problems, the only solution concept is the Nash equilibrium; however, there may be multiple Nash equilibrium solutions to a particular game.

The outcome of a game is a Nash equilibrium if the payoffs associated with it are such that no player wants to change his behavior or other players to change theirs. At a Nash equilibrium, each player's strategy is the best response he could make to the strategies chosen by each of his opponents. However, a game may have more than one Nash equilibrium. For example, in each of the coordination problems presented above, there was more than one Nash equilibrium. When multiple Nash equilibria are possible, it

is difficult to predict based on a formal description of the game itself which equilibrium will result.

Schelling (1960) argues that it is possible to predict the outcome of games of tacit coordination, but that to do so one must have some understanding of the context of the game and the likely expectations of the participants. Recall that in coordination problems, players must act in concert in order to avoid inferior outcomes, but they must do so without being able to communicate with one another. Players' choices depend upon their expectations of what their cohorts will do. To the extent that players have common expectations, the Nash equilibrium resulting from that behavior will be predictable. In Schelling's terminology, such an equilibrium is a focal point.

Schelling illustrates this idea with the example of a husband and wife who become separated from each other in a department store. It is likely that they will find each other because they will both think of some obvious place to meet. The challenge is to identify the one course of action that their expectations of each other converge on. Schelling argues that "most situations...provide some clue for coordinating behavior, some focal point for each person's expectations of what the other expects him to be expected to do" (p. 57). Finding a focal point may depend on imagination more than logic; it may depend on analogy, precedent, accidental arrangement, symmetry, aesthetic or geometric configuration, casuistic reasoning, as well as who the parties are and what they know about each other.

A primary characteristic of focal point solutions is some kind of prominence or conspicuousness. Focal points are salient solutions for those playing the game. It is also important for the focal points to be unique. For example, the couple lost in the department store cannot successfully coordinate by meeting at the "lost and found" if the

store has several. The uniqueness of a solution makes it a prominent, unambiguous choice for the players.

Schelling tested a number of mixed motive coordination games, in which the interests of the players differed. In spite of the conflict of interest inherent in this type of game, a particular solution usually emerged as a focal point for coordinated choice. The following is an example of a game he tested on a number of participants.

		Player B: Heads	Player B: Tails
Player A	Heads	3,2	0,0
	Tails	0,0	2,3

Players were told to choose heads or tails without communicating. If both chose heads, A would get $3 and B would get $2. If both chose tails, A would get $2 and B would get $3. In spite of their conflicting interests, in an experiment 16 out of 22 A's and 15 out of 22 B's chose heads. Because it was somehow psychologically compelling, heads thus emerged as a focal point solution. By coordinating their choices based on this focal point, the players performed substantially better than they would have with random choices or by acting in pure self-interest. If both A and B had tried for the maximum payoff of $3, they would both have received a payoff of zero. In this game, the need for agreement overruled the potential disagreement, and players achieved a common gain by allowing a focal point to coordinate their decisions.

Schelling's general conclusion is that the players of a coordination game can use focal points to solve their problem in a substantial number of cases, and that they do better than chance methods. Even the disadvantaged party in games with a conflict of interest permits himself to be disciplined by the message provided by the focal point.

Focal points are most important where communication is limited. The focal point concept is not as essential in cooperative games because the agents can communicate with each other. However, Schelling argues that focal points are still important in explicit bargaining situations. For example, precedents set by past behavior exert an influence on the outcome of bargaining games that exceeds their logical importance or legal force. Reliance on expectations based on historical market shares in an investment coordination game is an example of using precedents as focal point solutions.

The central question that Schelling is concerned with is what brings expectations to converge. Pure and mixed motive coordination games differ in their convergence properties. The incentives in pure coordination games have the potential for creating the bandwagon effect, resulting in excessively polarized behavior. In Schelling's example, when whites and blacks see that a neighborhood will "inevitably" become occupied by blacks, the "inevitability" is the result of convergent expectations. The expectation of inevitability is what makes the result inevitable, and there is no stable focal point except at the extremes. No one expects the neighborhood to end up 10, 30, or 60 percent black. On the other hand, the conflict of interest inherent in a mixed motive game may prevent the bandwagon effect.

There are several important dynamic characteristics of focal point solutions. Because a solution becomes a focal point because of some characteristic that distinguishes it qualitatively from alternative solutions, in bargaining situations, small concessions are

less likely than large ones. A focal point for agreement may owe its focal character to the fact that small concessions or small differences from alternative solutions are impossible. This may contribute to the stability of the focal point solution. Sometimes, however, the focal point may be inherently unstable--the solution may have some symbolic significance that makes agreement impossible. Schelling's assertion is not only that people are affected by symbolic details, but that they should be for purposes of correctly playing the game. He argues that experimental psychology may have much to contribute to game theory in this area.

Some authors, Schotter and Schelling, for example, believe that coordination problems are ubiquitous, and underlie many of our social conventions, institutions, and even the phenomenon of leadership itself. This discussion of problems of tacit coordination reveals that successful coordination of strategic choices is very difficult, even when reasonably clear focal points are present. When coordination problems are recurrent, players have an incentive to formulate rules or conventions which render their behavior and the behavior of others more predictable, helping them to avoid mutually disastrous outcomes. However, deciding on rules to make individual behavior contribute more to the welfare of the larger group requires communication among players. In other words, when a noncooperative coordination game is recurrent, players have an incentive to engage in a cooperative game, which involves bargaining over behavioral rules (Staatz, 1984).

The rules which facilitate stable solutions to coordination problems can be thought of as social institutions. A wide variety of institutions may emerge to solve a given coordination problem. These include, among other institutions, markets, committees, and mediators. The role of mediators is of particular interest with regard to investment

coordination, for in situations as complex as the expansion of industry, simple rules are not sufficient to coordinate the actions of individual firms. Bankers and security analysts can be thought of as mediators in the capacity expansion process, with the ability to absorb and analyze huge amounts of complex information in a way that could not be handled by pre-specified rules.

According to Schelling, a mediator is probably best viewed as an element in the communications arrangements of a game or as a third player with a payoff structure of his own who is given an influential role through his or her control over communication. However, a mediator can also influence other players' expectations on his own initiative. The mediator's directions have only the power of suggestion, but coordination via a focal point requires the common acceptance of some source of suggestion. Moreover, the mediator may consummate certain communications while blocking off certain facilities for memory. A mediator may be thought of as a scanning device or filter that can suppress some of the information that is put into it.

Banks and capital markets, as the sources of credit for capacity expansions, have a central role as mediators in the process. By interacting with investors who are prohibited by legal or competitive considerations from interacting with each other, bankers and security analysts may filter information and contribute to convergent expectations that lead to a stable expansion of industry capacity. Chapter 5 will examine in greater detail how financial institutions accomplish this.

A mediator may be converted into an arbitrator if the players in a game irrevocably surrender authority to him to make binding decisions. A bank may become a de facto arbitrator with the power to coordinate investments when a large number of the

firms in an expanding industry have few alternative sources of financing. The extent to which the Banks for Cooperatives may accomplish this will be examined in Chapter 7.

The role of banks and capital markets as mediators and arbitrators is the central topic of this research. It is important to understand their role as an institutional response to an underlying coordination problem. In a book entitled The Economic Theory of Social Institutions, Andrew Schotter uses the theory of noncooperative games to examine how situations such as coordination problems give rise to institutions which improve economic performance for society as a whole by coordinating the behavior of individuals.

3.5.4. Game Theory and the Development of Institutions

Schotter believes that understanding social institutions can only be done by viewing economic problems in an evolutionary light. He claims that "economic and social systems evolve the way species do. To ensure their survival and growth, they must solve a whole set of problems that arise as the system evolves" (pp. 1-2). In Schotter's view, the task for economists is to infer the evolutionary problem that caused an institution as we see it to have developed.

Schotter begins by reviewing two historical explanations in economics for the rise of social institutions. These include the "collectivist" and "organic" theories of institutions. The collectivist explanation, typified by John R. Commons, saw institutions as the expression of the conscious collective action of rational economic agents. Under the organic theory, institutions arise out of the selfish interaction of individual economic agents. Schotter's work falls into the second camp. He believes that institutions arise in a Lockean state of nature in which there are only agents, their preferences, and technology. Institutions emerge without any agent or agents consciously designing them, as Schotter

puts it, "by human action but not by human design." Ignoring the role of legislatures, he views institutions not as consciously adopted rules which are deliberately created through bargaining games, but as part of the solutions to iterated games of strategy.

Schotter presents a mathematical theory of institution creation, in which a behavioral convention is established to prescribe the behavior of agents at each iteration of a "supergame," i.e., an infinitely iterated static one-period game. His main question is: if a supergame has as possible equilibrium solutions both cooperative and non-cooperative equilibria, which will emerge and what factors will determine this?

Each player's total payoff associated with a particular strategy is the discounted stream of payoffs from infinite repetitions of the constituent game. Because the game is infinitely repeated, each player will recognize that the actions he takes today are bound to influence the expectations that other players will have about him in the future and thus the future actions of the other players. Therefore, each player has to choose a "mode of behavior" that will govern his actions over the infinite horizon of the game. An equilibrium convention exists if no player has incentive to deviate from it, i.e., each player's discounted payoff is highest when he does not deviate.

The problem is how to predict from theory which supergame strategy (or behavioral convention) will emerge. Schotter uses a static Bayesian solution procedure to predict what equilibrium convention will result. His main point is that the social institution that is actually adopted to solve a recurrent coordination problem is a stochastic event. Consistent with his view of the "organic" evolution of institutions, Schotter believes that the exact form of the institution that arises can be specified only probabilistically. In repetitions of the game, a universally accepted pattern of behavior is established, but the exact pattern that is institutionalized is actually randomly determined. Schotter states that

any theory that attempts to explain which of many possible equilibria will be chosen cannot be valid. He holds that any set of institutions existing at any point in time is really an accident of history.

Schotter begins with the implicit assumption that markets are the most desirable institution for resolving coordination problems, although they are not sufficient for doing so. In Schotter's analysis,

> ...prices are mechanisms that provide information about the societal scarcity of resources, whereas institutions are mechanisms that supply information about the potential actions of economic agents. Consequently, in markets where prices are not informationally sufficient to coordinate economic activity, some additional informational device will have to emerge to help in this coordination, because a problem of strategic interdependence among agents exists and the need to coordinate them has arisen (p. 157).

Institutions are thus primarily informational mechanisms that complement the information contained in competitive prices, allowing "institution-assisted decentralization" (p. 118).

Schotter develops the idea of the informational role of institutions by analyzing a game in extensive form[2] in which players have "imperfect recall." In games of imperfect recall, a player, when he moves, may not be able to remember one or more of his previous moves. Schotter treats individual players in this game as "teams of nonoverlapping generational agents" (p. 113). The role of institutions in this game is to "codify memory" for the agents in the economy and thereby transform the game they are playing from a game of imperfect recall into one of "institution-assisted perfect recall" (p. 109). Institutions accomplish this in his model by allowing the agents to use more informationally efficient behavioral strategies.

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[2] Games may be represented in extensive, normal or characteristic function form. Games in extensive form specify: 1) the players, 2) rules regarding whose turn it is to act, 3) the set of alternative actions available at each move, and 4) rules defining the information available to players at each move. Games in extensive form have the most complex informational requirements.

Schotter's research examines the link between fundamental coordination problems commonly found in all economies, and the institutions that organically arise to solve them. For Schotter, the actual choice of institutions among many possibilities is randomly determined. However, he raises the question of whether there are "biases" involved in the random process creating institutions:

> In the final analysis, the social world emerges from the chaos of a state of nature into the order of modern society through the evolution of institutions. The process is stochastic, so that what we observe as actually happening is merely one spin of an institutional roulette wheel. The only question is whether or not the wheel is biased (p. 164).

Staatz, on the other hand, disagrees with Schotter's claim that institutions emerge "by human action but not by human design." Because each Nash equilibrium represents a different allocation of payoffs among players, it is unrealistic to believe that a game with different welfare implications for the different members of a group would be decided probabilistically. Staatz asserts that institutions arise both by human action and by human design: "Which institution emerges depends not simply on chance or on the manipulations of an invisible hand, as Schotter suggests, but also on the distribution of power and the skill of those in society who grapple with ways to overcome these problems" (p. 275). The biases that exist in the institution creation process are attributable to the uneven distribution of power and skill among those determining rules to resolve coordination problems.

Another criticism of Schotter's approach concerns his fairly narrow view of the role of institutions. In his analysis, they are limited to the strictly informational role of improving players' expectations regarding how their cohorts will behave. He ignores the ideological role of institutions. By changing the beliefs of the players, institutions change

the utility that players attach to different outcomes of the game, ultimately modifying their behavior (Staatz, 1984).

However, in spite of the limitations of Schotter's institutional analysis, his work provides a useful backdrop for examining how a particular institution (the Banks for Cooperatives) resolves a particular coordination problem (the coordination of investments in industry capacity).

3.5.5. Observations on the Usefulness of Game Theory

Game-theoretic models may be designed in many ways, all of which may appear equally reasonable a priori. Moreover, game theory seldom yields deterministic solutions. Any particular model often generates many outcomes which can be justified as possible equilibria. Although this richness in modelling makes it easier to provide a theoretical rationale for a wide range of observed phenomena, it also reduces the usefulness of the models as predictive tools (Sutton, 1991). Because of the difficulty of predicting specific outcomes based on game-theoretic models, game theory itself becomes essentially a taxonomy of different types of strategic interdependence, providing the researcher with insights into the incentives, choice sets and behavior of participants in different types of games.

Game theory provides a basic framework for understanding the type of interdependence found in capacity expansion situations, but game-theoretic models cannot begin to capture the complexity found in actual cases, as was seen in the corn wet milling study. Game theory is mainly useful in conceptualizing the problem, less so in explicitly predicting the capacity expansion path that an industry will take. Although strategic uncertainty exists in all markets, game theory focuses on problems where the players and

the nature of their interdependence are known to each other. Although there were only eleven firms in the corn wet milling industry, the magnitude of calculations based on a game-theoretic approach to modelling capacity expansion in the industry was almost overwhelming. If anything, the Porter and Spence study points to the importance of expectations, focal points, rules of thumb, and intuition in capacity expansion decisions.

Even if it were possible to handle the complexity of the strategic interdependence of many firms in a game-theoretic model, the theory alone is not sufficient to predict the outcome of a coordination problem. As Schelling observes, context is very important, for it is often contextual detail that guides the players to discover stable outcomes. He argues that when players are inherently uncertain about each others' value systems or choices, and particularly when the outcome of a game is reached by a series of moves, some essential part of the study of coordination games is empirical. Because of the need for focal points (which are based as much on intuition as logic) to coordinate the players' choices, the strategic principles relevant to successful play cannot be derived analytically from a priori considerations. There is a role for empirical research to determine how focal points are formed and how they influence the strategic choices of economic agents facing coordination problems. Part of the survey of farmer cooperatives conducted as part of this research will address this issue.

3.6. Conclusions and Identification of Research Questions

To summarize, the neoclassical model's focus on static equilibria fails to address the question of how the process of adjustment from one equilibrium to another takes place. Richardson examined the adjustment process, and stressed the importance of entrepreneurial expectations in investment coordination. Scherer raised the empirical

question of whether concentration contributes to stabilizing or destabilizing the capacity expansion process. He sought to measure this with rather crude cross-industry comparisons, which focused on the association between industries' structural characteristics and successful investment coordination rather than the information flows that actually facilitate coordination. Richardson's concern with the formation of expectations is echoed in the work of Porter and Spence, as well as the work of Schelling and other game-theoretic models of coordination problems. Expectations have a central role in coordination, yet little empirical research has been done in economics on how expectations are actually formed and what sources of information underlie firms' expectations of rivals' behavior. Porter and Spence, for example, simply assumed that firms facing capacity expansion decisions behave in the manner suggested by a coordination game with a Nash equilibrium solution. However, as Schelling points out, empirical research is necessary to understand the thought processes of players facing a coordination problem, which may or may not correspond to the behavior suggested by an abstract theoretical game.

In order to delimit the role of the Banks for Cooperatives in investment coordination, it is necessary to understand how other potential coordinating institutions influence the expectations upon which the investment decisions of cooperatives are based. This involves examining how cooperative firms actually take into account the game-theoretic uncertainty that is inherent in decisions to expand capacity.

This review of the literature on investment coordination suggests a number of research questions:

1. To what extent are cooperatives aware of the investment plans of rival firms?

2. How do they become aware of rivals' planned investments? To what extent do cooperatives rely on security analysts' reports on IOF firms in the industry as a source of information regarding industry growth and competitors' expansion plans?
3. How does consideration of the investment plans of competing firms enter into cooperatives' feasibility studies of planned expansions? Do firms actually go through the five steps in making capacity expansion decisions as hypothesized by Porter and Spence? Do they consider multiple capacity expansion scenarios? Do they conceptualize the problem in intuitively game-theoretic terms? Do they understand the Nash equilibrium concept?
4. To what extent do firms rely on focal points to coordinate their behavior? What common sources of information in investment decision making cause firms' expectations to converge, enhancing the predictability of their behavior and reducing game-theoretic uncertainty?
5. Do these common sources of information cause any bias in managers' expectations of the returns to capacity expansions? To what extent does the bandwagon effect exist?
6. Do firms believe that preemptive capacity expansion is often a desirable strategy? To what extent do they evaluate the potentially disastrous results of such a strategy?
7. What factors check the responsiveness of firms to an increase in demand? Is the differential responsiveness of managers to investment opportunities enough to facilitate a stable, sequential expansion of industry capacity? To what extent is access to credit a constraint on firms' ability to expand?

These and other questions were addressed in a survey of firms eligible to borrow from the Banks for Cooperatives. The next chapter examines the characteristics of capacity expansion decision making by farmer cooperatives, which differs fundamentally from that of investor-owned firms in a number of important ways.

Chapter 4

CHARACTERISTICS OF CAPACITY EXPANSION DECISION MAKING BY FARMER COOPERATIVES

Having described the process of making capacity expansion decisions for firms in general, this chapter will focus on characteristics of capacity expansion decisions that are unique to cooperatives. These characteristics are classified into three categories: 1) characteristics of the industries in which farmer cooperatives have traditionally participated, 2) characteristics related to the organization and behavior of cooperative firms, and 3) characteristics of the individuals who are members and directors of cooperatives. The review of the literature on capacity decision making by cooperatives was used to target particular investment coordination problems they might experience. These issues were then included in the mail survey of cooperatives that was described in Chapter 2. The results of the survey are discussed below.

4.1 Characteristics of Cooperative Industries

The industries in which farmer cooperatives have historically participated have many characteristics which contribute to problems with investment coordination. The industries into which farmers have vertically integrated via cooperatives are those which are adjacent to farming (specifically, farm inputs and the initial handling and processing of

farm products). The atomistic structure of much of the farm sector, combined with the uncertainties associated with biological production processes and inelastic demand, contributes to the volatility of agricultural product prices. Cooperatives play a coordinating role as a buffer in the adjacent industries by providing institutions for managing supply and distributing risk.

The industries in which cooperatives participate tend to be fairly concentrated. This originally gave rise to the need for cooperatives to be formed as a countervailing power to the oligopolistic and oligopsonistic industries on either side of the farmer. Cooperatives were intended to be a competitive yardstick whereby their farmer members could better evaluate the costs and prices of the investor-owned firms with whom they did business. Although competition among cooperatives and IOFs is often fierce at the retail level, much of the food system is dominated by firms of tremendous size, breadth, and complexity. Larger cooperatives often operate in an environment of concentrated economic power.

Cooperatives generally handle commodity goods, whether they are farm inputs or outputs. This leaves them with little ability to protect themselves from the capacity expansion decisions of rival firms by differentiating their products. The amount of value-added is often much greater in the later stages of food processing, when products lend themselves to greater differentiation. Because cooperatives are a vertical extension based upon farm production of commodities, they tend to be tied to low value-added and low differentiation markets. Both demand and prices tend to be unstable in commodity industries, making investment coordination even more difficult.

Economies of scale are often large in the manufacture of inputs or the processing of farm products. This leads to capacity expansions that are lumpy, increasing the likelihood that excess capacity will result when new plants are brought on line.

Moreover, the tendency to overbuild in order to achieve economies of scale is exacerbated by high exit barriers. Disinvestment is impeded by the fixity of cooperatives' assets. There are two facets of asset fixity that affect agribusiness industries. First, assets may be very specific to a particular use, for example a sugarbeet processing plant, and thus not easily re-deployable for technological reasons. In other words, there is no market for the assets due to characteristics of the assets themselves. Furthermore, assets may be fixed due to market coordination factors. Overinvestment in these industries may mean that the salvage value of assets is so low that they cannot be profitably redeployed.

The spatial characteristics of agricultural production also contribute to high exit barriers in adjacent industries. For example, many grain storage facilities were built in an era of different production, marketing and transportation requirements. As production and marketing patterns change, excess capacity may arise in some areas. Moreover, investments in these industries tend to be capital intensive. High fixed costs relative to variable costs leads to a greater sensitivity of these firms' profits to changes in volume. For this reason, they keep operating in an attempt to cover their fixed costs, instead of simply exiting the industry.

Furthermore, cooperatives operate in industries in which government policies contribute to instability in the size of their markets. Programs restricting farm production, like the PIK program (1983 to 1988), for example, have caused financial difficulties for farm supply cooperatives. Supply cooperatives are generally limited to fertilizer production. The majority of other inputs are manufactured by IOFs and sold under highly

advertised brand names. Because cooperatives generally do not expend resources on research and development, they generally are not basic in more technologically complex inputs. Relying predominantly on sales of fertilizer to the farm market increases the vulnerability of these firms to changes in government commodity policies.

Sporleder (1986) identified several trends in the structure and technology of farming that will have an impact on agribusiness industries in the coming years. First, there is a well-documented trend toward a bi-modal farm structure. Large commercial farms produce the majority of output. Many of these large farmers are able to bypass the local dealer network by buying farm inputs directly from manufacturers. This puts pressure on cooperatives to change their retail pricing practices in order to keep their larger customers. The competitive pressure from IOFs could result in cooperatives serving a shrinking market segment of the smaller and less profitable farmers.

There is a trend in many parts of the food system toward fewer but larger firms. Input supply industries (farm machinery, fertilizer, agricultural chemicals, seeds) are undergoing consolidation. The trend toward fewer but larger firms is also expected to continue among food processors.

The major technological advances in agricultural production are likely to come from biotechnology research. This involves the genetic engineering of plants and animals to have characteristics desired by food manufacturers and consumers. Sporleder anticipates that these changes will push the food system in the direction of "controlled diversity." In the past, relatively homogeneous products have been sorted by grades and sold in cash markets.[1] In contrast, products from biotechnology will have very specific

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[1] Exceptions to this observation are found in broilers, hogs and vegetables for processing, where considerable contracting exists.

characteristics designed to meet the needs of relatively low-volume end use market segments. The marketing system is likely to move away from mass markets and toward a tighter vertical coordination (via contracting or integration) over a larger number of marketing channels.

As a result, a variety of forms of non-cash arrangements will replace spot cash market transactions. According to Sporleder, cash markets have declined in importance from handling 81 percent of total agricultural output in 1960 to 69 percent in 1980. During the same period, vertically integrated transactions increased from four percent to eight percent of total output, and production and marketing contracts have increased from 15 percent to 23 percent. As spot cash markets decline in importance and become thinner, price variability in cash markets is likely to increase. This will complicate the planning of investments by cooperatives, and will put pressure on them to develop tighter coordination with their members.

Integrative arrangements between farmers and processors usually provide for the purchase of inputs as well as the marketing of products. However, in the federated cooperative system, unlike vertical integration, the farmer has no obligation to buy from (or sell to) the local, and the local has no obligation to buy from (or sell to) the regional. This lack of commitment has a negative impact on cooperatives' ability to manage and to plan. A greater commitment of locals to regionals and both to the BCs could reduce duplicative investments and lead to improved strategic planning and lower costs for farmers, their local and regional cooperatives, and the BCs (Hopkin and Associates, 1987).

These industry trends will likely result in the continued consolidation of cooperative firms. There were almost 9,000 cooperatives in the United States in 1960. This number had fallen to slightly more than 6,000 by 1980. The decline in the number of

cooperatives is projected to continue, with perhaps only 3,400 remaining in the year 2000 (Hopkin and Associates, 1987). The excess capacity which has existed in agribusiness industries for much of the 1980s will have to be rationalized in some sort of consolidation process.

While industry characteristics are important determinants of cooperatives' capacity expansion decisions, organizational issues and member attitudes also play a large role. They are discussed in turn below.

4.2. Structural Characteristics of Farmer Cooperatives

Staatz (1987) examined the structural characteristics of farmer cooperatives and the behavioral consequences that flow from them. This section draws upon Staatz's work to describe aspects of cooperatives' structure that have a direct impact on how they make investment decisions.

Staatz uses the following three characteristics to define a farmer cooperative firm: 1) the stockholders, who are farmers, are the major users of the firm's services; 2) the benefits a stockholder receives from investing capital in a cooperative are tied largely to patronage; and 3) the formal governance of the cooperative is democratically structured. In other words, voting is not proportional to equity investment. Each of these unique characteristics of cooperative firms has an impact on their capacity expansion process.

4.2.1. Consequences of Stockholders Being Major Patrons

Because the stockholders of a cooperative are also the major users of the firm's services, a cooperative's scope for profit maximization is different from that of an investor-owned firm (IOF). An IOF simply seeks out expansion possibilities that are the most

profitable, given the resources over which the firm has control. In contrast, farmer cooperatives have incentives to operate in such a way that members' farms and the cooperative are jointly seeking benefits, rather than operating as separate profit centers.

One result of this is that cooperatives often take into account the fixed costs of farmer patrons when making decisions. Therefore, a cooperative is more likely to try to provide a "home" for its members' products. Cooperatives also concentrate their investments in industries and activities that are closely related to farming operations. While stockholders in an IOF may lose money if an investment goes bad, farmers investing in cooperatives are at even greater risk, to the extent that they could suffer capital losses in their farming operations as well. The stockholder-user identity encourages cooperative management to view the cooperative and its members' farms as integrated activities.

The degree to which investments of the farm and the cooperative are coordinated depends on the incentives facing the farmer members and the degree of common interests among an often heterogeneous membership. If farmers have individual incentives to undertake investments to expand production even though the entire membership would benefit from cutting production, the potential gains from investment coordination at the farm level are lost. If members are heterogeneous with regard to products and goals, it may be difficult for them to reach a decision about which investments, if any, might be in their common interest to undertake. In this case, the cooperative will probably operate more like a separate profit center. While this still may be beneficial to the members, some of the potential gains from the vertical coordination of investments will be lost.

Another result of tying stock ownership to patronage is that the pool of equity capital available to the cooperative is severely limited. While an IOF may raise equity capital for financing a new investment by issuing new stock to the public, a farmer

cooperative can only raise equity by persuading its members to subscribe additional capital or by recruiting new members, both of which may be difficult. As a result, it is thought that cooperatives may be more highly leveraged than IOFs in the same industry. Their difficulty in raising equity capital also may keep them from entering highly capital intensive agribusiness industries, such as the manufacture and sale of farm machinery.

The shareholder-user identity also has an impact on the riskiness of the shareholders' investments in the cooperative. When farmers invest in a cooperative, they further commit their resources to a particular line of business. Because they are not diversifying their asset holdings, they are absorbing more risk than an investor in an IOF who can diversify more easily by buying and selling stock in different companies. This may result in members pressuring management to be more conservative in its investment strategies. However, this depends on the covariance of returns on cooperative assets and member assets. This covariance can be managed in ways other than conservative investment strategies, although cooperative managers may not pursue these.

Although the stockholder/patron identity raises many difficult problems for cooperatives, in some ways it may also contribute to the success of cooperatives' investments in productive capacity. The information flow between patrons and management may be improved because the owners are also the users of the firm's services.

Unlike an IOF, a cooperative may be able to more accurately assess future demand because its membership list facilitates communication with the buyers of the firm's products or services. The greater loyalty of patrons to their cooperative also contributes to the cooperative's ability to project future demand, mitigating one source of uncertainty in the capacity expansion process.

Moreover, the fact that a cooperative's customers are also its owners may improve investment decision making because stockholders demand that management be well-informed about the technical aspects of their farming operations. In contrast, managers of an IOF may be financial experts but far less knowledgable about the specific production processes of the investments they are undertaking.

4.2.2. Consequences of the Return on Investment Being Gained Through Patronage

Staatz presents three main reasons why the benefits that a stockholder receives from investing in a cooperative are largely tied to patronage: 1) because dividends paid on equity capital are strictly limited, 2) because net margins are distributed to shareholders on the basis of patronage rather than stock ownership, and 3) because cooperative stock does not appreciate in value because there is no secondary market for it. These three factors together have a significant impact on the investment decisions of a cooperative.

First, these factors may cause members to underfinance their cooperative. By investing in a cooperative, farmers gain the right to patronize it. If the only return the members receive is through patronizing the firm, i.e. no dividends are paid, then a member can increase his or her return only by increasing patronage relative to the initial investment. This can result in the cooperative being underfinanced. To counter this tendency, cooperatives have developed a number of mechanisms, such as capital retains, base capital plans, and the witholding of patronage refunds, to align members' capital contribution with their patronage. This tendency toward underfinancing contributes to the difficulties cooperatives face in raising equity capital for the purpose of financing expansions of productive capacity.

Second, the fact that there is no secondary market for cooperative stock affects investment decision making in a number of ways. A certificate of stock ownership in an

IOF may be exchanged at any time, making it possible to realize capital gains based on the future value of a firm's investments. In contrast, the holder of stock in a farmer cooperative can only claim part of the cooperative's residual earnings if he or she continues to patronize the firm. Because cooperative stock is not exchanged in an organized capital market, no capital gains may be realized on it. Aside from those tied to patronage, the benefits of cooperative membership may accrue in the form of increased profitability of the farming operation.

The fact that cooperative stock is illiquid complicates the investment decision making process, creating a "horizon problem" which often divides cooperative membership with regard to investments. Because most of the benefits of cooperative membership are gained through current patronage, there is incentive for some members, particularly those nearing retirement, to pressure the cooperative to favor current earnings at the expense of future earnings. Members who believe that they will not be around to reap the benefits of investments will demand that the cooperative have large cash payouts, accelerate equity retirement programs, increase the dividends paid, and even liquidate the cooperative's assets.

Although the horizon problem creates a continual incentive for part of the membership to avoid undertaking investment projects, there are a number of factors which mitigate this problem. These can be classified into three categories: 1) substitutes for a secondary market in cooperative stock, 2) issues involving the socialization of members, and 3) management issues.

The horizon problem may be mitigated by several mechanisms which partially substitute for a secondary market in cooperative stock. If membership in a cooperative can be sold when the farm is sold, the value of the farm will reflect the capitalized

expected future earnings from membership in the cooperative. As a result, the horizon problem would be overcome because "overinvested" or retiring members would have an incentive to care about the future profitability of the cooperative. The ability to sell cooperative membership could also be achieved if the farm were incorporated and the corporation, rather than its owner, became a cooperative member. Moreover, if production quotas or processing contracts could be exchanged, then the future earnings of the cooperative would be capitalized into their prices. Finally, if the cooperative has a policy of completely open membership, then the value of the cooperative is capitalized into the value of the farm.

The second way in which the horizon problem may be mitigated is through the socialization of the cooperative's members. If they receive greater satisfaction from bequeathing a profitable farming operation and cooperative, older members may be more willing to finance long-term investments. The horizon problem may be reduced even more if older members are socialized to extend that sense of responsibility to the rest of the cooperative's membership.

Third, the attitudes and actions of a cooperative's management play a large role in reducing the horizon problem. When managers are interested in the growth of the coop, their actions will be in opposition to those advocated by members seeking to decapitalize the firm. Management may even act to ensure the cooperative's long-term viability by pursuing its own growth-oriented goals.

Equity redemption programs address the problem of transferring ownership of the cooperative from one generation to the next. If a cooperative redeems its equities on a regular schedule and members expect this to continue, then equity redemption may provide some members a retirement income whose payments depend on the future

financial performance of the cooperative. The incentive for the retiring member to be concerned about the long-term viability of the cooperative mitigates some of the effects of the horizon problem. However, a cooperative which systematically redeems member equity must also systematically acquire new equity in order to maintain the firm's capital structure. Attracting new equity to the cooperative is difficult, especially since capital contributions are tied to patronage.

Due to the problems associated with raising equity capital, there is strong pressure for managers to maintain some unallocated reserves as permanent equity in the firm. Although some observers feel that it leads to the separation of ownership and control, the existence of permanent reserves facilitates long-run planning and give managers greater flexibility, thus enhancing coordination at the micro level.

Another consequence of the lack of a secondary market for cooperative stock is that an important source of discipline for the management of a cooperative is missing. Shareholders in an IOF may choose to sell their stock if they do not like what management is doing, or to attempt, through a proxy fight, to displace current management and replace it with one whose strategies they prefer. Alternatively, they may sell their shares to outsiders who make a tender offer, intending to replace current management. Because of these possibilities, fluctuations in the price of a company's stock acts as a disciplining force on management. When stock options are offered to top management, the disciplining force of the stock market is increased even more. The business press adds to the discipline by reporting on the activities of management, including capacity expansion decisions of the major firms in an industry.

Since shareholders of cooperatives cannot rely on stock prices and the financial press to discipline management, they must devise other ways to monitor managerial

behavior. One way is to have the board of directors take a more active role is overseeing management decisions, which is discussed in greater detail below.

4.2.3. Consequences of Democratic Control of Cooperatives

Democratic control in a cooperative is intended to place limits on voting on the basis of equity ownership. This is designed to prevent political control from being concentrated in the hands of those who contribute most of the firm's capital. Consequently, the power to control the major decisions of the firm is diffused across all members, resulting in a very different decision making process than what is observed in IOFs. This diffusion of power creates the potential for a large number of small patrons to exploit the minority of large patrons, although the possibility of large patrons exiting to rival firms places limits on this exploitation.

As a result of democratic control, coalition building plays a much more important role in decision making in cooperatives than in IOFs. Cooperatives may be less able to react to market opportunities than their IOF competitors because the transaction costs of reaching a decision may be higher in cooperatives than in IOFs. In a situation of rising demand for a product, this factor may lessen a cooperative's chances of expanding before an investor-owned rival does. However, this will depend on the degree to which the cooperative's members and board of directors delegate decision making authority to management, which is likely to be greater in cooperatives with a large or heterogeneous membership.

Most cooperatives prohibit or restrict non-members from serving on the board of directors. This is done to preserve member control, but in some instances can result in a board that lacks the expertise to evaluate and monitor the behavior of management, particularly when the cooperative's operations are complex or extend far beyond the farm.

Restricting board membership to farmer patrons may improve the coordination between cooperative and farming operations, but it may do so at the expense of industry-wide coordination, if board oversight of management allows poor decisions to be made regarding capacity expansion.

Cooperative boards of directors often play a more active role in firm decisions than those in IOFs. In contrast to IOF boards, a cooperative board has the role of voicing patron concerns to management, as well as acting as a trustee of shareholders' wealth. Unlike shareholders of an IOF, cooperative members and directors are intensely interested in certain decisions, such as pricing, that in IOFs would be delegated entirely to management.

Another factor contributing to the boards' active involvement in the cooperative firms' decisions is the difficulty of devising appropriate incentive systems and indicators of managerial performance. Using stock options to motivate and reward managers is not possible in cooperatives, whose stock can only be purchased by patrons and does not generate capital gains income. If a cooperative board evaluated its manager on the basis of profits, the manager would have an incentive to raise prices of member services and cut any activities which contribute only to the profitability of members' farming operations. The cooperative would be run as a separate profit center, and the benefits of vertical coordination would be lost to farmer members.

4.3. Characteristics of Cooperative Members and Directors

Along with characteristics of industries and firm structure, the attitudes of cooperative members and directors play an important role in the capacity expansion process. Some member characteristics may contribute to improved investment

coordination. For example, a common ethnic background may contribute to greater loyalty of members to their cooperative, improving the cooperative's ability to assess future demand for its products and services. However, many attitudes of members and directors may hinder investment coordination efforts. Surveys of Texas cooperatives (1982), their members (1984), and board chairmen (1985) by Black and Knutson provide some insight into the attitudes and opinions of these individuals and their impact on the investment activities of cooperatives.

Just as the selective perception of policymakers determines the political institutions governing investment coordination, selective perception is also important in understanding which coordination problems cooperatives respond to. One reason for the recent experience with excess capacity in cooperative industries may be the perception among cooperative members and directors that competition between cooperatives is good. In the Texas A&M surveys, 52 percent of the responding cooperative board chairmen said that cooperatives should actively compete with other cooperatives. They also said that declining volume was a major problem, resulting in higher costs per unit of production because fixed costs are less effectively spread. In spite of this acknowledged problem, the majority of board chairmen thought competition was good for business. Moreover, 66 percent of responding cooperative members felt that competition among cooperatives is good for farmer members. Black and Knutson observe that many cooperative leaders are so self-centerd that the idea of building a productive, efficient national or regional cooperative system never occurs to them.

Farmers often maintain memberships in more than one cooperative. In a survey of 455 cooperative members in Texas, Black and Knutson found that farmers reported being members of, on average, 2.6 cooperatives. Multiple membership often pits one

cooperative against another, leading to overcapacity and duplication of services, especially at the retail level. The results of multiple membership are particularly devastating when more than one regional cooperative serves a given area.

One response to the financial stress imposed by excess capacity has been an increase in mergers, joint ventures, and restructurings by cooperatives. Given the long-range trends toward consolidation in these industries, there is a need for cooperative leaders to consider how they might best manage the transition to fewer, but larger, cooperatives. Mergers are probably the best way for the number of cooperatives to decline. The least loss in the value of member equity is through mergers, while the greatest loss is imposed through bankruptcies.

In spite of this, most cooperatives would rather compete than merge. Forty percent of the Texas cooperatives studied had been approached with offers to merge. Most of these offers were turned down, 25 percent without even being studied. Eighty-two percent of the cooperative board chairmen surveyed said that their cooperative would never merge. Black and Knutson (1987) speculated that many of these will face a continually weakening financial structure, with the Banks for Cooperatives maneuvered into making further loans that only postpone their eventual demise. They suggested that leadership in consolidating cooperatives will have to come from regionals or the BCs. In fact, the BCs have provided leadership in initiating and supporting mergers and joint ventures among their borrowers in some industries and regions. This is discussed in greater detail in Chapter 7.

Farmers' desire for competition among cooperatives reflects a lack of commitment to the cooperative system. In the Texas surveys, only 53 percent of members felt that they have an obligation to patronize their cooperative. These same members felt an even

lower level of commitment towards regional cooperatives. Only five percent of the respondents felt that local grain cooperatives should turn over all their grain to regional cooperatives. To the extent that farmers prefer competition to cooperation, some of the potential benefits of cooperation will be lost.

Strategic planning by cooperatives is very important in the investment coordination process. Cooperative boards reported being most frequently divided on issues of expansion and replacement of capital goods. These issues are even more problematic when volume is declining due to excessive competition. Although there is a need for feasibility studies and long-range strategic plans, it appears that strategic planning is not a common activity of cooperatives. Only fifteen percent of the board chairmen in the Texas survey have written a long-range plan. Most of the cooperatives that do have long-range plans have written them in the 1980s, suggesting that only recently have cooperatives become aware of the importance of strategic planning. One half of the board chairmen without a long-range plan said that they would like to have one. Thirty-eight percent of them said that they did not want their cooperative to have a long-range plan. Attitudes like this undoubtedly contribute to the investment coordination problem that cooperatives are currently experiencing.

Among those cooperatives that engage in strategic planning, the BCs are a major source of help in the planning process. In the 1982 survey of Texas cooperatives, many reported seeking outside assistance in two areas: 1) long-range planning, and 2) financial planning. Sixty-nine percent of the cooperatives surveyed preferred BC assistance for long-range planning and 84 percent preferred BC assistance for financial planning. Assistance from the Banks for Cooperatives was preferred over all other sources, including regional cooperatives, land grant universities, and private consultants.

4.4. Survey Results: The Investment Planning Process of Cooperatives

The rest of this chapter presents the results of the mail survey of cooperatives that was described in Chapter 2. The respondents to the survey were cooperative managers who were speaking for or about their cooperative regarding investment strategies and outcomes. For the most part, only frequency tables are presented in the chapter. Relevant cross-tabulations (e.g., breakdowns of responses by firm size and commodity group) are discussed in the chapter, but the tables for them are presented in Appendix G).

4.4.1. Investment Strategy

Questions of investment strategy concern the size, type and timing of capacity additions, and how firms seek to position themselves within their markets relative to their competitors. This section examines how cooperatives may differ from investor-owned firms on issues of investment strategy.

4.4.1.1. Separation of Cooperative and Farm Profit Centers

Because farmer cooperatives are vertical integrations of the farming operation forward into marketing and backward into farm supplies, there is a strong complementarity between the cooperative's investments and investments undertaken at the farm level. As Staatz (1987) puts it,

> The scope for optimization in a farmer cooperative is potentially broader...than in a competing IOF that is not vertically integrated into farming. It is broader in the sense that a profit-maximizing farmer-member would be interested not in running the farm and the cooperative as separate profit centers, but in optimizing the performance of the integrated farm/cooperative system. (p. 36).

The broader scope for optimization means that the cooperative is likely to take into account the fixed costs of farmer members when making investment decisions. Farmer

cooperatives thus have a tendency to concentrate investments in industries which enhance the value of on-farm assets.

The vast majority of respondents (90.4 percent) reported that all or most of their investments were closely related to the farming operations of members. Only 9.6 percent of the respondents claimed that they had few investments that were closely related to

Table 4.1

Concentration of Cooperative Investments in Industries Related to Farming

I.1 To what extent does your cooperative concentrate its investments in industries that are closely related to the farming operations of your members?

Response	Frequency	Percent [1]
All investments are directly related to members' farming operation	85	48.0
Most investments are related	75	42.4
Many investments are not closely related	17	9.6

[1] Percentages based on 177 valid cases.

members' farming operations. (See Table 4.1). Similar percentages are observed across all size categories and commodity groups.

4.4.1.2. Investment to Accommodate Member Production

Most respondents (70.9 percent) either agreed or strongly agreed that an important role for a cooperative is to provide a "home", or marketing outlet, for all of its members' products. Very few of them (9.1 percent) were neutral on this topic, and 20 percent either disagreed or strongly disagreed with this role for marketing cooperatives. (See Table 4.2).

To the extent that it is an important motivation for investment, this opinion may translate into a bias on the part of marketing cooperatives in favor of expanding the cooperative's capacity to process as much as members produce. As a result, some cooperatives may "wrap a can around" whatever members produce, without adequately

Table 4.2

Investment to Accommodate Member Production

I.2 To what extent do you agree or disagree with the following statement: It is important for a marketing cooperative to provide a "home" for all of its members' production.

Response	Frequency	Percent [1]
Strongly agree	61	34.9
Agree	63	36.0
Neutral	16	9.1
Disagree	29	16.6
Strongly disagree	6	3.4

[1] Percentages based on 175 valid cases.

assessing final demand for the product.

This observation is corroborated by anecdotal evidence from the dairy industry. Brian Henehan, a dairy industry analyst at Cornell University, undertook several economic engineering studies of the cost of operating butter powder plants in the Northeast U.S. In one study, he analyzed the disastrous decision by a dairy cooperative to build a butter powder plant that resulted in severe excess capacity. He felt that one of the primary reasons was the biased decision making of the farmer-dominated board of directors. He believes that farmers tend to be overly optimistic about the prospects for an investment that will contribute to the profitability of their own farming operations. He thought that members overestimated the market for their own future production and then expanded

the cooperative's capacity in order to provide a home for it. Henehan commented that this is often exacerbated by open membership policies in which dairy cooperatives take whatever is produced by members without making any effort to control supply.[2]

When the survey responses to this question are broken down by commodity groups, it is evident that dairy cooperatives have much stronger feelings on this issue than the cooperatives in other industries. Among dairy cooperatives, 82.4 percent strongly agreed that it is important for the cooperative to provide a home for all of its members' production, as compared to only 34.9 percent for the entire group of respondents. The perishability of dairy products, as well as the high degree of asset specificity of both farm and cooperative-level investments, result in dairy cooperatives preferring tighter vertical coordination between the farmer and the cooperative. While this may enhance the value of farm-level investments, it may also compound investment mistakes made on the farm by leading to overinvestment at the cooperative level.

4.4.1.3. Awareness of Game-Theoretic Uncertainty

The survey also attempted to assess whether cooperatives perceive the capacity expansion decision in implicitly game-theoretic terms, and how aware they are of the potentially disastrous consequences of preemptive capacity expansions. First, they were asked to indicate the extent to which they find a strategy of preemptive expansion desirable, by agreeing or disagreeing with the following statement: "Given an opportunity to expand profitably, the best strategy is to expand immediately and on a large scale before competitors do." Over half the respondents (56.7 percent) agreed or strongly agreed that pre-emptive capacity expansion was an appropriate strategy. Another 24.2

[2] Telephone interview, February 7, 1992.

percent were neutral on the issue, while only 19.1 percent disagreed, none of them strongly. (See Table 4.3).

Table 4.3

Opinions on the Desirability of Preemptive Capacity Expansions

I.3 To what extent do you agree or disagree with the following statement: Given an opportunity to expand capacity profitably, the best strategy is to expand immediately and on a large scale before competitors do.

Response	Frequency	Percent [1]
Strongly agree	20	11.2
Agree	81	45.5
Neutral	43	24.2
Disagree	34	19.1
Strongly disagree	0	0

[1] Percentages based on 178 valid cases.

More small cooperatives disagreed with the desirability of a preemptive strategy than larger cooperatives. This is contrary to what was expected, i.e., that smaller firms would be able to successfully expand in smaller (less destabilizing) increments. However, small local cooperatives have more limited market areas and may actually be bigger players within those areas, with a greater awareness of the potentially destabilizing effects of preemptive strategies, than larger cooperatives that may be smaller players in national markets. When respondents were broken down by commodity group, grain cooperatives most often disagreed with a preemptive strategy. Forty-one percent of grain cooperatives disagreed, as compared to 19.1 percent of respondents overall.

Preemptive strategies may be more appropriate in some industries than in others. The success of such a strategy clearly depends on the scale and rate at which expansion

takes place, as well as the ability of the early investor to credibly deter rivals from expanding.

To further test cooperatives' awareness of their interdependence and the uncertainty they face with respect to others' decisions, they were asked whether they had ever experienced their competitors using a strategy of preemptive expansion. Sixty

Table 4.4

Use of Preemptive Expansion Strategies by Competitors

I.4 Have you experienced your competitors using a strategy like the one described in question 3?

Response	Frequency	Percent [1]
Yes	107	60.8
No	69	39.2

[1] Percentages based on 176 valid cases.

percent of respondents reported that they had. (See Table 4.4). Cooperatives in the sugar, rice and poultry and livestock commodity groups most often reported that their competitors had used strategies of preemptive capacity expansion, probably because cooperatives in these industries tend to compete with large investor-owned firms.

Next, the cooperatives being surveyed were asked whether a competitor's strategy of preemptive expansion had ever caused them to reconsider or abandon plans for expansion. Just over a fourth of respondents (26.7 percent) claimed that they had reconsidered or abandoned expansion plans in response to a rival firm's pre-emptive strategy, while almost three-fourths (73.3 percent) reported that they had not. (See Table 4.5). When responses were disaggregated by firm size and commodity grouping, a similar pattern was observed.

It can be concluded from the survey results that cooperatives are generally aware of the game-theoretic nature of the investment coordination problem. Although they advocate the use of a preemptive expansion strategy, for the most part, they do not seem to be overly concerned with the potentially destabilizing effects of such a strategy. This may be a reflection of industry conditions which allow this type of strategy to succeed.

Table 4.5

Effects of Competitors' Preemptive Expansion Strategies on Respondents' Investment Plans

II.5 Has such a strategy by competitors ever caused your firm to reconsider or abandon plans for expansion?

Response	Frequency	Percent [1]
Yes	47	26.7
No	129	73.3

[1] Percentages based on 176 valid cases.

However, sugar and rice cooperatives appear to be an exception. First, a majority of them disagreed with the desirability of a preemptive expansion strategy. Second, more of them reported having experienced their competitors using preemptive strategies, and third, all respondents in the sugar and rice industries reported having abandoned expansion plans because rivals had undertaken large-scale preemptive investments.

4.4.1.4. The Horizon Problem

The horizon problem may make it difficult for a cooperative to raise equity capital for an investment. Members nearing retirement may be reluctant to put up equity when they won't patronize the cooperative long enough to reap the rewards. Also, members who use only one of a cooperative's multiple products and services (say petroleum) may be reluctant to put up equity for an investment in an enterprise they will not use (say, a feed mill). Problems in raising equity capital may act as a check on the response of some

firms to opportunities to expansion and may thus contribute to investment coordination. It may also contribute to a declining market share for those cooperatives who are less able to react to investment opportunities than investor-owned firms.

Cooperative managers were asked to indicate the extent to which they agree or disagree that the horizon problem has led some members to prevent their firm from undertaking investments. About a fourth of respondents (23.4 percent) either agreed or strongly agreed that members with a shorter planning horizon had tried to prevent investments. Seventeen percent of the respondents were neutral on the issue, and 59.5 percent either disagreed or strongly disagreed that the horizon problem existed for their

Table 4.6

Prevalence of the Horizon Problem

I.6 To what extent do you agree or disagree that the following statement describes your cooperative: Because the benefits of cooperative membership may only be gained through patronage of the cooperative, some members, especially those nearing retirement, have tried to prevent the cooperative from undertaking investment projects.

Response	Frequency	Percent [1]
Strongly agree	9	5.1
Agree	32	18.3
Neutral	30	17.1
Disagree	85	48.6
Strongly disagree	19	10.9

[1] Percentages based on 175 valid cases.

cooperative. (See Table 4.6). While the majority of cooperatives had not experienced a horizon problem, a sizable share had.

When the respondents were disaggregated into groups based on firm size, it was found that the larger the cooperative, the less often the horizon problem was reported.

When responding firms were divided into commodity groups, it was found that dairy, sugar and rice cooperatives reported a horizon problem less often than fruit and vegetable, farm supply, grain, cotton and poultry/livestock cooperatives.

4.4.2. Information Sources

The purpose of asking firms to identify sources of information was to determine whether they tend to rely on common sources, which would create a common set of expectations and contribute to a more stable expansion of industry capacity. (See discussion of the Porter and Spence case study of corn wet milling in Chapter 3).

4.4.2.1. Consideration of competitors' investment plans

In order to assess how much game-theoretic uncertainty may contribute to overexpansion, cooperatives were asked to what extent they take into account the investment plans of their competitors when making their own expansion decisions. Out of the 177 cooperatives responding to this question, 27.7 percent reported that they carefully consider competitors' plans, while 57.1 percent reported that the plans of rival firms are considered to some extent, and 15.3 percent said that competitors' plans are not considered at all. (See Table 4.7). When the data are disaggregated into size categories or commodity groups, a similar breakdown of responses is observed.

However, one exception to this pattern is observed among sugar cooperatives. A much higher proportion of them (half) reported that competitors' plans are not considered at all. This may be due to the close vertical integration between beet and cane growers and processors. Highly specific assets are involved in both the harvesting and processing of these crops, so vertical coordination tends to be tighter, with fairly complete contracts used between growers and processors (Jacobs, 1988). This factor, combined with market

Table 4.7

Respondents' Awareness of Competitors' Investment Plans

I.7 When deciding whether to undertake capacity-expanding investments, to what extent does your firm take into account the investment plans of competitors?

Response	Frequency	Percent [1]
Competitors' expansion plans are carefully considered	49	27.7
Competitors' plans are considered to some extent	101	57.1
Competitors' plans are not considered at all	27	15.3

[1] Percentages based on 177 valid cases.

stability resulting from the U.S. government's quotas on sugar imports, may contribute to a capacity expansion process in which information on competitor's plans is less highly valued in the investment decision than in other industries. It may also indicate that sugar cooperatives have little need to gather information at the time of investment analysis as it is already readily available. The manager of a cane sugar cooperative in Florida commented in a telephone interview that the industry is more cooperative than competitive. He said that if his firm makes an improvement in their plant, they are more than willing to inform other sugar cane processors and invite them to come in and see how it works.

4.4.2.2. Sources of information on competitors' investment plans

An important determinant of the stability of an industry's expansion path is the quantity and quality of information on the investment plans of rival firms that enters into any firm's decision to expand capacity. The cooperatives surveyed were asked to identify from a list of possibilities the most important sources they rely on for this type of information. The most commonly checked source was customers, used by 76.3 percent of

Table 4.8

Sources of Competitor Information

I.8. What are the most important sources that you rely on for information about your competitors' investment plans?

Source	Frequency	Percent [1]
Financial press	60	33.9
Trade associations	96	54.2
Customers	135	76.3
Banks for Cooperatives	40	22.6
Other lenders	33	18.6
Common suppliers of materials	109	61.6
Common suppliers of services	46	26.0
Security analysts' reports	15	8.5
Public announcements	100	56.5
Consultants	30	16.9
Direct contact	118	66.7
Regional cooperatives	49	27.7
Other[2]	7	4.1

[1] Percentages based on 177 valid cases.
[2] The category "other" includes: SEC filings, annual reports, special studies, universities, and the "member grapevine."

the respondents. Information obtained from customers appears to play a fairly important role in coordinating expectations. Because customers (both members and nonmembers) often actively shop around among competing suppliers, they are in a good position to pass along information about one firm's activities to another firm. The next most common source of information was direct contact with competitors, used by 66.7 percent of the respondents. Common suppliers of materials were another important source of information about competitors' investment plans, cited by 61.6 percent of respondents. Apparently, a large number of respondents do not read the financial press or use consultants or regional cooperatives for information about competitors. (See Table 4.8).

It was expected that lenders and common suppliers of services would be much more important sources of information than they appear to be for respondents. Exclusivity in sourcing is extremely important for many firms. Common suppliers of services, such as accountants, auditors, law firms, etc., as well as banks, are often in a position to pass information about one firm's plans to another. According to the former CEO of one of the largest cooperatives in the country, who was interviewed for this research, bankers in particular are notorious for this. While he was CEO, his former cooperative brought a lawsuit against a commercial bank for passing information to a competitor. The suit was settled out of court, and the bank transferred the offending loan officer to another area.

The Banks for Cooperatives were chosen as an important source of information by 22.6 percent of the respondents, in spite of the claim by BC officials that they never pass information about one borrower's plans to another borrower. However, they do provide information on the financial condition of aggregated groups of borrowers. For example, at a symposium on cooperative issues at Kansas State University, a representative of the

Wichita Bank for Cooperatives presented historical financial data for local Kansas cooperatives borrowing from the BCs (Emerson, 1988). Only 18.6 percent of respondents reported obtaining competitor information from lenders other than the BCs, while 26 percent obtained information from common suppliers of services.

Security analysts' reports, thought by Porter and Spence to be an important information source for coordinating the expansion decisions of investor-owned firms, were used by only 8.5 percent of the cooperatives responding to the survey. This may reflect the smaller size and lack of financial sophistication of some cooperatives in the survey population, as well as the fact that most of them do not have large, publicly traded corporations as their primary competitors. For those that do, reports on the financial securities (stocks and bonds) of firms in their industries provide another source of information on their competitors' investment plans. A larger proportion (13.8 percent) of cooperatives with annual sales over $100 million reported using security analysts reports for competitor information. Also, their use was more common among sugar cooperatives (40 percent) and rice cooperatives (50 percent) than among the population as a whole (8.5 percent).

For those respondents who reported using sources other than the ones listed in the questionnaire, SEC filings, annual reports, universities, the industry grapevine, brokers and "snoops" were cited.

In addition to simply discovering which information sources are commonly used by cooperatives, an attempt was also made to discover how they evaluate the reliability of each source (see Table 4.9). One reason was to see if a single source or a few sources were more highly valued than others in the strategic planning process. The most reliable sources in the opinion of the respondents were trade associations, with 84.6 percent rating

Table 4.9

Reliability of Sources of Competitor Information

I.9. In your opinion, how reliable are these sources of information?

	Percent [1]				
Source	Very Reliable	Reliable	Unreliable	Don't Know	Valid cases
Financial press	4.0	58.9	13.2	23.8	151
Trade associations	9.0	75.6	6.4	9.0	156
Customers	8.8	61.6	22.6	6.9	159
BCs	20.7	53.1	2.8	23.4	145
Other lenders	6.5	58.0	8.0	27.5	138
Common suppliers of materials	5.9	68.6	11.8	13.7	153
Common suppliers of services	6.5	56.1	15.1	22.3	139
Security analysts' reports	1.5	38.8	13.4	46.3	134
Public announcements	9.2	59.2	23.0	8.6	152
Consultants	4.4	44.1	14.0	37.5	136
Direct contact	24.1	57.0	10.8	8.2	158
Regional coops	6.5	55.4	9.4	28.8	139
Other_____ [2]	12.5	18.8	---	68.8	16

[1] Percentages based on valid cases.
[2] The category "other" includes SEC filings, annual reports, special studies, universities, and the "member grapevine."

them as reliable or very reliable, followed by direct contact with competitors, common suppliers of materials, the BCs, and customers. Although only 22.6 percent reported relying on the BCs for competitor information, what information they obtained from them was thought to be highly reliable.

Although three-fourths of the respondents get information about competitors from their customers, this information was seen as unreliable by 22.6 percent of respondents. This unreliability rating was second only to public announcements, which were viewed as unreliable by 23 percent of respondents.

Almost half of the respondents (46.3 percent) said they did not know about the reliability of security analysts' reports, probably because their primary competitors do not have stock that is publicly traded. This is further indication that the stock market is largely absent as an investment coordination mechanism for farmer cooperatives.

4.4.2.3. Reporting of Respondents' Own Plans

Another attempt to assess the extent of game-theoretic uncertainty involved asking cooperatives whether their investment plans were well-reported so that competitors could plan investments knowing what industry capacity would be. A large majority of the respondents (72.3 percent) said that their plans were not well-reported, while 27.7 percent claimed their plans were. (See Table 4.10).

Table 4.10

Competitors' Awareness of Respondents' Investment Plans

I.10 Are your firm's investment plans well-reported so that competitors could make their plans knowing what industry capacity will be?

Response	Frequency	Percent [1]
Yes	48	27.7
No	125	72.3

[1] Percentages based on 173 valid cases.

When the responses to this question were broken out by firm size, the pattern was very similar, with the majority of firms in all size categories saying their plans were not

well-reported. However, when responses to this question were examined on an industry-by-industry basis, it was discovered that the pattern was reversed for rice and cotton cooperatives. Although only two rice cooperatives responded to the survey, both claimed their investment plans were well-reported. Of the eight cotton cooperatives that responded, five said their own investment plans were well-reported.

4.4.2.4. Sources of Information on Market Growth

As Porter and Spence pointed out, there are two primary sources of uncertainty in the investment decision environment: uncertainty about competitors' investment plans, and uncertainty about future demand for the product. In both cases, common sources of information used in the capacity expansion decision can lead to shared expectations among industry participants and a stable expansion path. Therefore, in addition to questions about competitors' plans, cooperatives were surveyed about their sources of information regarding market growth for their products.

Cooperatives were asked to rank the sources they rely on out of a list of ten possible sources. A problem arose in their interpretation of the question, however, with about half of the respondents ranking the sources and half simply checking the sources they use. Therefore, the ranked and unranked data from the question were analyzed separately.

Rankings are summarized for each source in Table 4.11, which presents the percentage of respondents using a source who ranked it 1 or 2. The category "other" appeared to be the most important, with 93.3 percent of 15 respondents giving it a ranking of 1 or 2. This result is misleading however, because about half of those choosing "other" listed internal analysts as the source. This confuses the question, as even internal analysts must get their information from somewhere, even if it is simply surveying customers or

Table 4.11

Sources of Demand Information (Ranked Data)

I.11 Which of the following sources does your firm rely on for information about market growth for your products?

Source	Percentage of respondents who ranked the source 1 or 2 [1]	Number of valid cases
Financial press	30.0	10
Trade association	66.7	51
Customers	75.4	69
Banks for Cooperatives	41.7	12
Other lenders	0	6
Market research services	68.8	48
Security analysts' reports	16.7	6
Consultants	53.3	30
Regional cooperatives	51.9	27
Other[2]	93.3	15

[1] Percentages are based on the number of valid responses for each source.
[2] The category "other" includes: reports of state and federal agencies, universities, accountants, and internally generated reports.

monitoring orders. Also included as "other" sources are USDA commodity reports, reports by state agencies, and universities.

Excluding the category "other", customers appeared to be the most important source of information on market growth, with 75.4 percent of the 69 respondents who chose them giving them a ranking of 1 or 2. Market research services were the next most important source, with 68.8 percent of the 48 respondents choosing them ranking them 1 or 2. Running a close third in importance was trade associations, ranked 1 or 2 by 66.7 percent of the 51 respondents who chose them. Twelve respondents reported using the

BCs as a source of market information, with 41.7 percent ranking them 1 or 2. Security analysts and lenders other than the BCs were used by the fewest respondents.

The unranked data confirms the conclusions drawn from the ranked data. Customers were the source most often chosen, with 71.6 percent of the 81 respondents reporting that they rely on customers as a source of market information. Market research services and trade associations were the next most important sources, chosen by 65.4 and 61.7 percent of respondents. The Banks for Cooperatives were chosen by 21 percent of respondents. As with the ranked data, security analysts' reports and lenders other than

Table 4.12

Sources of Demand Information (Unranked Data)

I.11. Which of the following sources does your firm rely on for information about market growth for your products?

Source	Frequency	Percent [1]
Financial press	10	12.3
Trade associations	50	61.7
Customers	58	71.6
Banks for Cooperatives	17	21.0
Other lenders	3	3.7
Market research services	53	65.4
Security analysts' reports	2	2.5
Consultants	30	37.0
Regional cooperatives	34	42.0
Other[2]	9	11.1

[1] Percentages based on 81 valid cases.
[2] The category "other" includes: reports of state and federal agencies, universities, accountants, and internally generated reports.

the BCs were the most seldom chosen of all the sources (see Table 4.12).

4.4.3. Financial Analysis

4.4.3.1. Sophistication of Feasibility Studies

In order to determine the degree of detail and completeness of their investment analysis, cooperatives were asked to identify types of analysis used in a typical feasibility study. Only 38.4 percent of respondents reported doing any discounting of projected returns, a surprisingly low figure given the size of the firms in the survey population. However, it is possible that the percentage of firms using discounting could actually be considerably higher, if those who hire consultants (33.1 percent) are simply unaware of the analytical techniques used by the consultants. Just over half (51.7 percent) of the respondents reported using multiple market growth scenarios in their feasibility studies, but only 20.3 percent reported considering multiple scenarios regarding possible capacity expansions by competitors. Probabilities were attached to the scenarios by 36.6 percent of the respondents. More than a fourth of them (26.5 percent) reported using none of these

Table 4.13

Sophistication of Feasibility Studies

I.12. Which of the following does your firm use in a typical feasibility study for construction of new capacity?

Practice	Frequency	Percent [1]
Discounting of projected returns	66	38.4
Assistance from outside consultants	57	33.1
Multiple market growth scenarios	89	51.7
Multiple capacity expansion scenarios	35	20.3
Probabilities attached to scenarios	63	36.6
None of the above	45	26.5

[1] Percentages based on 172 valid responses.

analytical tools in feasibility studies for the construction of new capacity. (See Table 4.13).

When the responses were broken down by size of firm, it was discovered that the larger the cooperative, the more often discounting is used. Smaller firms more often reported using consultants. Moreover, smaller firms looked at market growth and capacity expansion scenarios, as well as probabilities associated with them, far less than larger firms. Also, smaller cooperatives more often reported using "none of the above" analytical tools.

Table 4.14

Percentage of Cooperatives by Size Category Using Various Analytical Practices in their Feasibility Studies [1]

Practice	< $30 million	$31 - 50 million	$51 - 99 million	> $100 million
Discounting	24.3	28.6	36.4	50.0
Consultants	40.5	25.7	39.4	30.6
Market growth scenarios	37.8	57.1	51.5	56.5
Capacity expansion scenarios	10.8	14.3	21.2	27.4
Probabilities	32.4	40.0	39.4	37.1
None of the above	32.4	28.6	27.3	21.7

[1] Percentages based on 166 valid responses.

(See Table 4.14).

Responses to this question were also broken down by commodity group. Cotton cooperatives and specialty cooperatives listed under "other" reported using discounting far less than cooperatives in any other commodity group. Sugar, rice, cotton and poultry/livestock cooperatives made the least use of consultants. Market growth scenarios were most often reported being used by grain and poultry/livestock cooperatives. Multiple capacity expansion scenarios were not widely used by any commodity group, but fruit and vegetable and cotton cooperatives used them the least. Grain and farm supply firms appeared to pay more attention to estimating various market growth scenarios and

attaching probabilities to them, probably because changes in export demand or agricultural policies can have a huge impact on the size of their markets. Cotton cooperatives and those in the "other" category most often reported using "none of the above".

Responses to this question indicate that the degree of sophistication of cooperatives' investment analysis is, in many cases, quite low. Firms often discount the projected cash flows from an investment using the weighted average cost of capital, with the weights reflecting the proportions of debt and equity used to finance the investment.[3] An investor-owned firm would use the expected return on the company's stock (both the dividend yield and expected capital gain) as its cost of equity capital. However, for cooperatives, valuation of the equity component is much more difficult because their stock is not exchanged in a secondary market. Consequently, many cooperatives simply discount cash flows using a discount rate that reflects only the cost of debt. The cost of debt is lower than the cost of equity because bondholders bear less risk than shareholders, who are the residual claimants of the firm's earnings. Therefore, leaving out the cost of equity biases the discount rate downward, making projects look more attractive than they otherwise would have.

The firms that reported using discounting in their analysis of proposed investments were asked to indicate how they choose a discount rate. Of the 65 firms who use discounting, 30.8 percent reported that they simply use the cost of a bank loan to finance the project. Only a few of the respondents (6.2 percent) indicated that they would use the cost of debt issued by the cooperative to finance the project. The weighted average

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[3] This assumes that the firm is undertaking an expansion in its current primary line of business. Some authors, e.g. Brealey and Myers (1991) call for the use of the marginal rather than the weighted average cost of capital as the discount rate. The discount rate should be the opportunity cost of capital that reflects the risk of the specific asset being acquired.

Table 4.15

Methods Used by Cooperatives to Choose A Discount Rate

I.13 If you checked number 1 in the above question, how do you choose a discount rate?

Response	Frequency	Percent [1]
Use the cost of a bank loan to finance the project	20	30.8
Use the cost of debt issued by the cooperative to finance the project	4	6.2
Use the weighted average cost of all sources of debt used to finance the project	9	13.8
Use the weighted average cost of both debt and equity capital used to finance the project	29	44.6
Other:_____ [2]	3	4.6

[1] Percentages based on 65 valid cases.
[2] Those who checked "other" used a hurdle rate chosen by the board of directors.

cost of all sources of debt was used by 13.8 percent of respondents, while almost half of the respondents (44.6 percent) reported using the weighted average cost of both debt and equity capital used to finance the project. Three respondents (4.6 percent) used some other method to choose a discount rate, generally a hurdle rate somewhat arbitrarily chosen by the cooperative's board of directors and compared to the project's internal rate of return. (See Table 4.15). When responses were disaggregated by firm size and commodity group, a similar pattern is observed.

Those cooperatives who reported including the cost of equity capital in the discount rate were asked what method they used to value it. The majority (65.6 percent) of respondents who include the cost of equity reported valuing it using the rate of return that could be earned by the cooperative in specific alternative investments. The rate of return that could be earned in the member's farming operation was used by 3.1 percent,

Table 4.16

Methods Used by Cooperatives to Determine the Cost of Equity Capital

I.14 If the cost of equity capital is included in the discount rate, how do you determine the cost?

Response	Frequency	Percent [1]
The rate of return that could be earned by the cooperative in specific alternative investments	21	65.6
The rate of return that could be earned in the member's farming operation	1	3.1
Other:_____ [2]	10	31.3

[1] Percentages based on 32 valid cases.
[2] The respondents who checked "other" used a hurdle rate that makes some provision for the cost of equity, the historical rate of return for the coop, a market cost of equity from public companies in the same business, or an industry average rate of return.

while 31.3 percent of respondents reported using some other method to measure the cost of equity capital to their firm. (See Table 4.16). Other methods included using the average cost of equity for the industry, often determined by the stock price for public companies in the same business, the historical rate of return for the cooperative, or some hurdle rate that is more or less arbitrarily chosen. One firm used a hurdle rate equal to three times the prime rate, and another firm reported using a hurdle rate equal to the risk-free rate of return (on 30-year Treasury notes) plus 3 to 4 percentage points. Often the cost of equity was not explicitly estimated, but was implicitly included when the discount or hurdle rate is higher than the firm's cost of debt. One respondent commented that their hurdle rate is above the cost of borrowing and typically the cost of borrowed capital is higher than the returns on farmers' alternatives, so the opportunity cost of capital in the member's farming operation is not an appropriate measure for the

cooperative's cost of equity as it does not reflect the riskiness of the cooperative's investments.

4.4.3.2. Difficulty in Raising Equity Capital

Another way in which cooperatives differ from IOFs is in their choice of capital structure, or what levels of debt and equity they will use to finance investments. Because of the difficulties of getting members to contribute equity to their cooperative (discussed above in section 4.2.2), it has often been thought that cooperatives tend to rely more heavily on debt financing than their investor-owned peers (Parliament, et al., 1989). If cooperatives do use a greater proportion of debt financing, then the coordinating role of the BCs may be enhanced.

However, there is also evidence that the opposite is true. Some people claim that, because they often regard equity as "free", cooperatives are financed with too much equity, which costs more than debt. In a seminar on equity management strategies sponsored by the Arthur Capper Center for Cooperatives at Kansas State University, a representative of what was then the Wichita BC observed that cooperatives in Kansas were financed with 60 percent equity, on average, which is far higher than would be considered optimal by IOFs of comparable size. He stated,

> It would be unthinkable, in most industries, to permit your corporation to become 60 percent equity financed without giving serious thought to either (1) investing that "excess" capital in new ventures, or (2) purposefully dropping equity levels to optimize (read minimize) the firm's total cost of debt and equity capital (Emerson, 1988, p. 7).

Parliament, et al. found that dairy cooperatives, contrary to expectations, did not have higher leverage ratios than investor-owned firms in the same industry. They found that the leverage ratios of dairy cooperatives fall between the leverage ratios for the top and bottom quartiles of investor-owned firms and have been continuously falling since the

mid-1970s, indicating that dairy cooperatives are making greater use of equity capital in financing their operations.

Little research has been done on the determinants of capital structure for cooperatively owned firms. Moreover, over 30 years of research have revealed conflicting evidence regarding the determinants of capital structure for investor-owned firms (Harris and Raviv, 1991). However, the goal here is not to analyze what drives cooperatives' choice of capital structure. For purposes of this research, the goal was to understand to what extent difficulty in raising equity capital leads cooperatives to rely on debt, whether from the BCs or some other source.

The cooperatives surveyed were asked whether they had an unallocated surplus that could be used as a source of investment financing. The majority of respondents (59 percent) reported that they did have an unallocated surplus.[4] (See Table 4.17). This would reduce their need to seek debt financing from a BC or other lender. A similar percentage was observed for each size category of firms. A breakdown of responses by

Table 4.17

Availability of Unallocated Surplus

I.15 Does your firm have an unallocated surplus that it can use as a source of investment financing?

Response	Frequency	Percent [1]
Yes	102	59.0
No	71	41.0

[1] Percentages based on 173 valid cases.

[4] "Unallocated surplus" is the term cooperatives use for retained earnings. It is the portion of net income that is distributed to an equity account that is not divided among members. Earnings may also be retained in the form of deferred patronage refunds. For most cooperatives, almost all equity investment is done through retention of earnings (as opposed to per unit retains or direct investment).

commodity group revealed that the availability of an unallocated surplus was significantly lower for dairy, sugar and rice cooperatives, which may reflect lower profit margins in these industries. However, it does not follow that cooperatives in these industries use more debt. Dairy, sugar and rice cooperatives, at least those among the 100 largest, are not as highly leveraged as those in several other commodity groups, for example, cotton, fruits, vegetables and nuts, and poultry and livestock. (See Table 6.1).

Cooperatives were also asked how difficult it would be for them to raise a substantial amount of new equity capital from members to finance an investment. In order to make the question applicable to cooperatives of different sizes, they simply were told to assume they have a feasibility study showing a 15 percent rate of return and a lender requirement of 40 percent of the capital from new equity, with the respondents filling in the scale of investment appropriate to their own firm. Responses to this question

Table 4.18

Difficulty of Raising New Equity Capital

I.16 How difficult would it be for your cooperative to raise a substantial amount of new equity capital from members to finance an investment? (Assume you have a feasibility study showing a 15 percent rate of expected return and a lender requirement of 40 percent of the investment from new equity).

Response	Frequency	Percent [1]
Almost impossible	35	20.1
Very difficult	49	28.2
Somewhat difficult	62	35.6
Fairly easy	27	15.5
Very easy	1	.6

[1] Percentages based on 174 valid cases.

indicated that cooperatives varied widely in their ability to raise new equity capital to finance an investment. Just over 20 percent responded that it would be almost impossible to do, while 28.2 percent said the task of raising new equity would be very difficult. It was reported to be somewhat difficult by 35.6 percent of respondents, while 15.5 percent thought it would be fairly easy. Only 0.6 percent (one respondent) rated the task very easy. (See Table 4.18).

When respondents were broken into size categories, it was observed that the larger the cooperative, the easier it appeared to be to raise equity capital, although the differences by size category were not dramatic. Breaking down the respondents by commodity group revealed that fruit and vegetable, farm supply and poultry and livestock cooperatives more often reported the task of raising new equity capital to be very difficult or almost impossible. A breakdown of respondents into those who do the majority of business with farmers (locals) and those who do the majority with other cooperatives (regionals) revealed that the firms that deal directly with farmers seem to have a slightly easier time getting equity contributions from members.

4.4.4. Governance and Decision Making

4.4.4.1. Heterogeneity of Membership

Caves and Peterson (1986) have argued that the decision making structure of cooperatively owned firms makes it difficult for them to respond to investment opportunities, possibly leading to a decline in their market share relative to investor-owned firms. Among other factors, the heterogeneity of a cooperative's membership may slow down the process of coming to an agreement about whether to expand. However, the cooperatives surveyed did not feel the heterogeneity of membership to be a hindrance.

They were asked to indicate the extent to which they agreed or disagreed with the statement: "The diverse business interests of my cooperative's membership makes it difficult for members to reach a decision about which investments to undertake." More cooperatives disagreed with the statement than agreed. Twenty-one percent were neutral, while 27.9 percent agreed or strongly agreed, and 51.2 percent either disagreed or strongly disagreed. (See Table 4.19). Heterogeneity does not seem to be viewed as an impediment to investment by most cooperatives.

Table 4.19

Effect of Heterogeneous Membership on Investment Decisions

I.17 To what extent do you agree or disagree with the following statement: The diverse business interests of my cooperative's membership makes it difficult for members to reach a decision about which investments to undertake.

Response	Frequency	Percent [1]
Strongly agree	16	9.1
Agree	33	18.8
Neutral	37	21.0
Disagree	76	43.2
Strongly disagree	14	8.0

[1] Percentages based on 176 valid cases.

When responses were broken down by size of firm, it was revealed that more of the larger cooperatives disagreed that members' diverse business interests make it difficult to agree on which investments to undertake. A much larger percentage of the smaller cooperatives reported the diverse interests of members to be a hindrance to making investment decisions. However, large cooperatives reported more often than smaller cooperatives that members do not have to approve capacity expansions.

A breakdown of responses by industry revealed that grain, farm supply and poultry/livestock cooperatives more often reported that the heterogeneity of members made it difficult for their cooperative to make investment decisions.

A related question is whether this problem makes the cooperative less able to react to investment opportunities than their investor-owned rivals. Over half (55.4 percent) of respondents felt that the task of getting members to reach a decision did not make their cooperative less able to react to investment opportunities than their investor-owned competitors. However, a sizable 44.6 percent of respondents did feel that getting members to agree constrained their firm relative to their rivals. (See Table 4.20).

Table 4.20

Effect of Cooperative Ownership on Ability to Respond to Investment Opportunities

I.18 Does the task of getting members to reach a decision make your cooperative less able to react to investment opportunities than your non-cooperative competitors?

Response	Frequency	Percent [1]
Yes	78	44.6
No	97	55.4

[1] Percentages based on 175 valid cases.

A much higher percentage of small cooperatives (those with annual sales under $30 million) reported that the task of getting members to reach a decision makes them less able to react to investment opportunities than their IOF competitors. There is a higher degree of member involvement in investment decision making among smaller cooperatives. A breakdown of responses by commodity group showed that more grain (70.4 percent) and rice (100 percent) cooperatives reported that they were less able to react to opportunities for expansion than their noncooperative rivals.

4.4.4.2. Ability to Reduce Demand Uncertainty

Although the structure of cooperative firms may make decision making difficult, it may also improve cooperative performance by allowing management to use close contact with members to predict demand more accurately than investor-owned firms. Almost half (47.4 percent) of the cooperatives surveyed either agreed or strongly agreed that close contact between management and members improved their ability to predict demand. Thirty percent were neutral, and 22.5 percent disagreed or strongly disagreed that ability to predict demand was improved. (See Table 4.21).

Table 4.21

Effect of Cooperative Ownership on Demand Uncertainty

I.19 To what extent do you agree or disagree with the following statement: Close contact between cooperative management and members allows us to predict demand for our firm's products and services more accurately than our investor-owned competitors are able to.

Response	Frequency	Percent [1]
Strongly agree	20	11.6
Agree	62	35.8
Neutral	52	30.1
Disagree	32	18.5
Strongly disagree	7	4.0

[1] Percentages based on 173 valid cases.

The largest cooperatives (those with annual sales greater than $100 million) reported less often than smaller cooperatives that close contact with members allowed management to predict demand more accurately than investor-owned competitors. Breaking down respondents by commodity group revealed that farm supply, grain and cotton cooperatives responded far more often than firms in other commodities that close contact with members improved their ability to predict demand. Seventy percent of farm

supply and grain cooperatives, and 75 percent of cotton cooperatives, agreed with the statement, as compared to 47.4 percent overall.

A cooperative's ability to reduce demand uncertainty depends in part on the proportion of its business that is does with members, as well as the extent to which there is communication between cooperative management and members. More extensive communication with patrons may give cooperatively owned firms informational economies that improve their performance relative to investor-owned firms. It appears that many cooperatives recognize and benefit from these informational advantages.

4.4.4.3. Delegation of Decision Making Authority

The conflicts that cooperatives may encounter in getting members to reach a decision about what investments to undertake may be overcome if a significant amount of decision making authority is delegated to management. For 1.7 percent of the respondents, management does all analysis of investment projects, as well as all decision making. In 68.8 percent of the respondents, managers analyze investment projects, and the board of directors votes on the recommendations of management. Both management and the board are actively involved in analyzing investments, with the board making the final decision, in 25.6 percent of the respondents. In only four percent are the board and/or members actively involved in both investment analysis and decision making. (See Table 4.22).

Similar patterns are observed when the responses are broken down by firm size and commodity group, although the largest cooperatives more often reported that management does all investment analysis without any involvement from the board except to vote on the final proposal.

Table 4.22		
Investment Decision Making Authority in Cooperatives		
I.20 To what extent do the directors of your cooperative delegate investment decision making authority to management?		
Response	Frequency	Percent [1]
Management does all analysis of investment projects and all decision making	3	1.7
Management does all analysis of investment projects; board votes on their recommendation	121	68.8
Both management and board are actively involved in the analysis of investments, board makes final decision	45	25.6
Board and/or members are actively involved in both the analysis of investment projects and decision making	7	4.0
[1] Percentages based on 176 valid cases.		

Cross-tabulations were run to check for correlation between the extent of management control over investment decision making and the belief that marketing cooperatives should provide a "home" for all that members produce. Management-led organizations were no more or less likely to advocate providing a "home" for members' production than were other cooperatives.

For the majority of cooperatives, management and the board appear to take the leading role in deciding which investments to undertake, with very little direct member involvement. A large majority of firms (70.9 percent) reported that members do not have to approve capacity expanding investments, while 18.3 percent of respondents require member approval for all expansions. (See Table 4.23).

A breakdown of responses by firm size showed a similar pattern across all categories. When responses are broken out by commodity group, sugar cooperatives

Table 4.23		
Member Approval of Investments		
I.21 Do members have to approve capacity-expanding investments undertaken by your cooperative?		
Response	Frequency	Percent [1]
Yes, all expansions	32	18.3
Yes, but only expansions larger than a certain dollar amount	19	10.9
No	124	70.9
[1] Percentages based on 175 valid cases.		

reported more often than cooperatives in other commodities that members have to approve capacity expanding investments.

Some cooperatives (10.9 percent) require member approval only for expansions which are larger than a certain dollar amount. For the 19 firms with a cap on the size of investment that can be made without member approval, the mean cap was $638,000, with values ranging from $20,000 to $5,000,000. Although managers in general do not have to seek member approval for every decision, they certainly run the risk of losing their jobs if

Table 4.24		
Presence of Non-Members on Cooperative Boards of Directors		
I.22 Does your cooperative allow non-members to sit on the board?		
Response	Frequency	Percent [1]
Yes	17	9.8
No	157	90.2
[1] Percentages based on 174 valid cases.		

they do not take member interests into account to a sufficient degree.

Cooperatives may have a built-in bias toward over-expansion if the investment decision making process is dominated by members and/or directors who want the cooperative to build capacity to accommodate the size of members' farming operations. One way of overcoming this bias is for the cooperative to have outside directors on the board. The vast majority of cooperatives surveyed (90.2 percent) do not permit non-members to sit on their boards. (See Table 4.24). A similar percentage was reported across all categories when responses were broken down by firm size and commodity group. Of the 15 cooperatives who do have outsiders on their boards, two-thirds felt that outsiders improved the firm's investment decision making, while one-third felt that they did not. (See Table 4.25).

Table 4.25

Effect of Non-Member Directors on Investment Decisions

I.23 If you answered yes to the above question, has the presence of non-members on your board improved your firm's investment decision making?

Response	Frequency	Percent [1]
Yes	10	66.7
No	5	33.3

[1] Percentages based on 15 valid cases.

4.4.5. Investment Experience

4.4.5.1. Diagnosing Excess Capacity

As a measure of investment coordination performance, cooperatives were asked to report capacity utilization rates for each of their enterprises. These are shown in Table

Table 4.26

Capacity Utilization of Cooperatives by Line of Business

I.24 What percent of your cooperative's capacity in each of its enterprises is currently being utilized?

Line of business	Average percent utilized	Number of firms
Retailing of farm inputs	79.4	79
Manufacturing of farm inputs	69.2	40
Assembly and handling of member products	69.4	75
Processing of member products	78.0	71
Other [1]	48.5	11

[1] "Other" includes bulk petroleum distribution, petroleum retailing, regional wholesale farm supply, and warehousing.

4.26. Seventy-nine cooperatives who retail farm inputs reported a mean capacity utilization rate of 79.4 percent. The 40 cooperatives who manufacture farm inputs are using on average 69.2 percent of their capacity. The 75 firms which assemble and handle member products are operating at 69.4 percent of capacity, on average. The 71 cooperatives engaged in processing of members' products were using 78 percent of their capacity. The average capacity utilization rate of 48.5 percent was much lower for those in other lines of business. These included bulk petroleum distribution, retailing of petroleum products, wholesaling of farm supplies and warehousing.

It is difficult to judge when a business has excess capacity simply by looking at capacity utilization rates. Demand for the cooperative's products or services may be seasonal, creating excess capacity during certain times of the year. Moreover, almost all businesses operate with some slack capacity built in. For the U.S. manufacturing sector as a whole, a capacity utilization rate of 83 to 84 percent is thought to be high enough to generate fears of inflation. Defining the point at which extra capacity becomes "excess" is exceedingly difficult.[5]

In order to get a better sense of the number of firms suffering from excess

Table 4.27

Number and Percent of Firms Utilizing 50 Percent of Capacity or Less, by Enterprise

Line of business	Number of firms	Percent of firms in that line of business
Retailing of farm inputs	5	6.3
Manufacturing of farm inputs	8	20.0
Assembly and handling of member products	19	25.3
Processing of member products	9	12.7
Other [1]	7	63.6

[1] "Other" includes bulk petroleum distribution, petroleum retailing, regional wholesale farm supply, and warehousing.

capacity, Table 4.27 lists the number and percentage of firms operating at 50 percent of capacity or less by enterprises. Only 6.3 percent of cooperatives retailing farm inputs are operating at less than half capacity, as compared to 20 percent of those manufacturing

[5] For a discussion of approaches to defining industry capacity, see Spielman (1977), "Capacity Measurement in the U.S. Agricultural and Non-Agricultural Sectors: A Literature Review." For a critique of common capacity utilization measures, see "Key Economic Statistic Comes Under Fire," Wall Street Journal, December 13, 1988.

farm inputs, 25.3 percent of those engaged in the assembly and handling of member products, 12.7 percent of those processing member products, and 63.6 percent of those in other lines of business.

Table 4.28

Prevalence of Excess Capacity Problems Among Cooperatives

I.31 Are you suffering from serious problems of excess capacity in any of your lines of business?

Response	Frequency	Percent [1]
Yes	68	38.2
No	110	61.8

[1] Percentages based on 178 valid cases.

Another approach to diagnosing excess capacity is simply to assume that managers will know it when they see it. In the questionnaire, cooperative managers were asked whether, in their judgment, their firm was suffering from serious problems of excess capacity. Thirty-eight percent of the respondents said that they were. (See Table 4.28).

Table 4.29 presents a breakdown by commodity group of cooperatives claiming to be experiencing serious excess capacity problems. Grain cooperatives reported excess capacity problems most frequently, followed by rice cooperatives.

Table 4.29	
Cooperatives with Excess Capacity, by Commodity Group	
I.31 Are you suffering from serious problems of excess capacity in any of your lines of business?	
Commodity Group	Percent reporting excess capacity
Fruits and vegetables	40.7
Farm supply	38.9
Grain	63.0
Farm supply and grain	50.0
Dairy	27.3
Sugar	33.3
Rice	50.0
Cotton	0
Poultry/livestock	30.0
Other	14.3

Table 4.30		
Awareness of Market Share		
I.30 Are you aware of your firm's share of total industry capacity?		
Response	Frequency	Percent [1]
Yes	143	80.8
No	34	19.2
[1] Percentages based on 177 valid cases.		

Moreover, cooperative managers did seem to be aware of how their firms are positioned vis-a-vis the rest of the industry, with 80.8 percent of them claiming to know their firm's share of total industry capacity. (See Table 4.30). Awareness of their firm's share of total industry capacity increased as the size of the firm increased, with 90.9 percent of cooperatives with annual sales greater than $100 million reporting that they

know their firm's share of total industry capacity. A breakdown of responses by commodity group showed that dairy and grain cooperatives least often reported knowing their share of industry capacity, while rice and fruit and vegetable cooperatives most often reported knowing it.

A list of more narrowly defined industries was obtained by asking cooperatives in an open-ended question to indicate which of their own lines of business, as well as any others they knew of, had problems with excess capacity. The goal here was to simply identify all specific industries where cooperative managers were aware of excess capacity problems. Table 4.31 presents the list of industries identified by the respondents.

Excess grain storage capacity appears to exist in all of the major grain-producing states, with cooperatives in Iowa, Kansas, Nebraska, Ohio, Oklahoma and Indiana most often mentioning grain storage to be a problem. Excess capacity in feed manufacturing and fertilizer mixing and application also exists in many localities. However, this does not appear to have prevented further expansion from taking place. The manager of a local farm supply cooperative in a mid-Atlantic state remarked,

> Although several small feed stores and mills (at least two with CoBank aid) have closed within a 30-mile radius, others have expanded and most remain under-utilized. A similar situation prevails in fertilizer mixing and application.

Given the fact that unwise investment decisions have been made, it is important to examine the expectations and events that have led to the existence of excess capacity in many areas.

4.4.5.2. Causes of Unprofitable Investments

Just over half of the firms surveyed (54.9 percent) reported having made unprofitable investments in the last ten years. (See Table 4.32). Breaking down the respondents into size categories revealed that the larger the firm, the more often they

Table 4.31

Industries Reported to Have Excess Capacity

Industry	Number of Times Mentioned
Grain storage	40
Feed manufacturing	19
Fertilizer mixing and application	11
Farm input retailing	7
Fluid milk processing	7
Canned and frozen fruits and vegetables	6
Bulk petroleum distribution	5
Petroleum retailing	3
Livestock auction facilities	3
Cheese	3
Butter	3
Nonfat dry milk	3
Ag. chemicals distribution	3
Almond products	2
Seed processing	2
Fertilizer manufacturing	2
Farm machinery	2
Sugar cane milling	2
Pinto bean processing	1
Rice packaging equipment	1
Petroleum refining	1
Car care center	1
Oat processing	1
Processing of off-grade figs	1
Coffee processing	1
Egg breaking and processing to liquid	1
Poultry	1

reported having made unprofitable investments in the last ten years. A breakdown by commodity group showed similar responses across all size categories, although somewhat fewer farm supply cooperatives and more rice and poultry/livestock cooperatives reported unprofitable investments. Also, more cooperatives using discounting and multiple capacity

Table 4.32

Cooperatives' Experience with Unprofitable Investments

I.25 Investments are always made based on expectations. In the highly uncertain world, expected returns frequently don't materialize and investments may turn out to be either unprofitable or less profitable than alternative investments would have been. Moreover, often investments that would have been profitable are not made.

In the past 10 years, has your firm made any investments that have proven to be unprofitable?

Response	Frequency	Percent [1]
Yes	96	54.9
No	79	45.1

[1] Percentages based on 175 valid cases.

expansion scenarios in their feasibility studies reported having made unprofitable investments in the last ten years, so there does not appear to be a correlation between the degree of sophistication used in analyzing investments and the investments' outcomes. However, there is a problem in interpreting these results. An aggressive firm will have some project failures in a large portfolio of investments, even though overall the firm's decision making is good. Some cooperatives may have responded that they had no unprofitable investments simply because they didn't invest. The question does not adequately distinguish between these two cases.

Those firms who had made unprofitable investments were asked to identify the events which resulted in their original expectations regarding returns to the investment not being met. Almost sixty percent of them reported that demand for the product was lower than expected, while 37.8 percent said that expansion by rival firms drove down prices. This indicates that primary, or demand-related uncertainty is more often given as a cause of failed investments than secondary, or game-theoretic uncertainty. Technological change

caused obsolescence of assets leading to unprofitability for 8.2 percent of respondents. Problems internal to the firm were cited as a cause of unprofitable investments by 46.9 percent of respondents. Other factors, including changes in government programs, lack of member support, weather and unavailability of inputs were reported by 12.2 percent of respondents as causing investments to be unprofitable. (See Table 4.33).

Table 4.33

Reasons for Failure of Investments

I.26 What were the unexpected events that resulted in not meeting your original expectations?

Event	Frequency	Percent [1]
Demand for the product was lower than expected	57	58.2
Technological change caused obsolescence of assets	8	8.2
Rival firms also expanded, driving down prices	37	37.8
Internal problems (e.g., plant start-up delays, management problems, design problems, etc.)	46	46.9
Other	12	12.2

[1] Percentages based on 98 valid cases.

Although respondents more often reported failure of demand to meet expectations to be a reason for unprofitable investments than actions taken by competitors, it may be that they simply looked at sales falling below expected levels and perceived that as a demand failure. However, lower-than-expected sales may also represent an unexpected loss of market share due to the investment, production and marketing decisions of competitors.

The reasons for investments being unprofitable were different for firms in different size categories. Lower-than-expected demand for the product was listed more often by the largest firms than by smaller ones. Expansion by rivals was more often given by smaller cooperatives as a reason why their investments failed to be profitable.

Different commodity groups also reported different reasons for unprofitable investments. Lower-than-expected demand for the product was the most commonly cited reason for farm supply, farm supply/grain, dairy, rice, cotton and specialty cooperatives. Technological change causing obsolescence of assets was by rice cooperatives as an important reason for unprofitable investments. Expansion by rival firms was most commonly cited by grain cooperatives, and internal problems, such as plant start-up delays, management problems, etc., were most frequently given by fruit and vegetable, sugar and poultry/livestock cooperatives as reasons for failed investments.

Because respondents were permitted to check more than one cause, the following question asked them to rate how important competitors' expansions were in their firm's

Table 4.34

The Importance of Competitor Expansion As A Cause of Unprofitable Investments

I.27 To what extent were investments undertaken by competitors an important factor resulting in failure to achieve expected returns from your investments?

Response	Frequency	Percent [1]
Very important	6	6.1
Important	20	20.4
Somewhat important	38	38.8
Not important	34	34.7

[1] Percentages based on 98 valid cases.

failure to reap profits from their investments. Only 6.1 percent rated expansion by competitors as a very important cause, with 20.4 percent ranking it important, 38.8 percent as somewhat important, and 34.7 percent as not important. (See Table 4.34). Thus game-theoretic uncertainty does appear to be viewed by cooperatives as an important cause of investment failure, but other causes are perceived to be more important by a majority. However, unlike technological obsolescence, changes in consumer preferences, or the business cycle, game-theoretic uncertainty is something that can be dealt with by designing appropriate institutions for coordinating investments.

4.4.5.3. Missed Investment Opportunities

Over-responsiveness of firms is a source of only one type of investment coordination failure, that which results in excess capacity. Undercapacity is also an example of coordination failure, caused by firms' failure to respond to opportunities for profitable expansion.

Although no attempt is made here to diagnose and measure undercapacity, cooperative managers were asked whether they felt that their firm had missed out on any significant opportunities for profitably expanding capacity during the last ten years. Those

Table 4.35

Responsiveness of Cooperatives to Investment Opportunities

I.28 Do you feel your firm missed out on any significant opportunities for profitably expanding capacity during the last 10 years?

Response	Frequency	Percent [1]
Yes	79	44.9
No	97	55.1

[1] Percentages based on 176 valid cases.

who felt they had taken advantage of all opportunities (55.1 percent) outnumbered those who felt they had missed out on some (44.9 percent). (See Table 4.35).

Cooperatives in the largest size category (sales greater than $100 million) reported missing out on investment opportunities far more often than smaller firms. This may reflect the fact that large cooperatives with national or international markets have more expansion opportunities in the first place than smaller cooperatives serving more limited geographical areas. A breakdown of respondents by commodity groups revealed similar responses to this question across all groups.

Table 4.36

Reasons for Failure to Respond to Investment Opportunities

I.29 If you answered yes to the above question, what factors prevented your firm from undertaking these investments that would have been profitable?

Factor	Frequency	Percent [1]
Board rejected proposal	26	32.9
Rejection of loan application by lender	8	10.1
The opportunity was not generally recognized by the firm	42	53.2
Lack of resources to put together a feasibility study	11	13.9
Other	11	13.9

[1] Percentages are based on 79 valid cases.

For those who did feel that they had missed some opportunities, the majority (53.2 percent) attributed it to the failure of the firm to recognize the opportunity. The next most common reason was the board rejecting the proposal, cited by 32.9 percent of respondents. For 13.9 percent of them, the lack of resources to put together a feasibility study was a constraining factor. The lender's rejection of their loan application was the reason cited by 10.1 percent of respondents. Other reasons were given by 13.9 percent of

respondents. These included timing with respect to other investments, being outbid in attempts to purchase assets, internal balance sheet restrictions, and getting members to agree. (See Table 4.36).

The responses of firms in all size categories were very similar. However, firms in different commodity groups gave different reasons for not taking advantage of all opportunities for expansion. For fruit and vegetable and sugar cooperatives, the most frequently cited reason for not undertaking investments that would have been profitable was the board's rejection of the proposed expansion. For farm supply, dairy, rice, cotton and specialty cooperatives, the most commonly cited reason was that the opportunity was not recognized by the firm. Grain cooperatives equally cited the board's rejection of the proposal and management's failure to recognize the opportunity as reasons for not undertaking investments.

The responses to this question indicate that the differential responsiveness of cooperative managements to opportunities for expansion is probably an important factor contributing to investment coordination. Denial of credit by lenders does not appear to be a major factor. One BC loan officer commented that if a cooperative board decides to undertake a project, nothing will stop them. They will find the financing somewhere, even if at a high cost. Access to alternative sources of financing thus limits the coordinating ability of the BCs.

4.4.6. Links Between Decision Making and Investment Outcomes

Cross-tabulations were run on the data set to link cooperatives' decision making practices and their investment outcomes. The cross-tabulations sought to determine whether undesirable investment outcomes are more often experienced by firms that: 1)

believe marketing cooperatives should provide a "home" for members' output, 2) believe in large-scale, preemptive expansions of capacity, 3) fail to consider competitors' investment plans, and 4) fail to use discounting, multiple scenarios or consultants in their investment analysis. The undesirable outcomes used in the cross-tabulations were: 1) unprofitable investments, 2) missed investment opportunities, and 3) problems with excess capacity.

Among those firms who agreed or strongly agreed that it is important for a marketing cooperative to provide a "home" for its members' products, over half had made unprofitable investments in the last ten years. Among those who disagreed or strongly disagreed with the statement, over 80 percent reported having made unprofitable investments. However, it is difficult to say whether past investment experiences caused their opinion on this issue, or the other way around.

The respondents who thought that a marketing cooperative should provide a "home" for members' output were much less likely to have missed out on investment opportunities than those who disagreed with this role for marketing cooperatives. Also, a much higher percentage of those who disagreed or strongly disagreed with the statement reported that they were suffering from excess capacity. This indicates that those who disagreed with the statement may have done so in response to past overinvestment.

Slightly more of the firms believing in the desirability of large, preemptive capacity expansions reported having made unprofitable investments than those who did not espouse a preemptive expansion strategy. The incidence of cooperatives who reported having missed out on investment opportunities was about the same for firms that believed in preemptive expansion and those that did not. The percentages of cooperatives reporting excess capacity problems were also about the same for those who did and did not follow a preemptive strategy.

Contrary to what was expected, the more carefully a cooperative considered competitors' plans when evaluating a possible expansion, the more often they reported having experienced unprofitable investments. Those who carefully considered the plans of rival firms reported having made unprofitable investments twice as often as those who did not consider their competitors' plans at all. Again, this probably reflects the fact that failed investments in the past have lead some cooperatives to be much more careful in their investment planning, or that certain cooperatives have an underlying investment conservatism that leads them to undertake fewer investments.

A similar result was obtained for missed investment opportunities. Those cooperatives reporting that they carefully consider competitors' plans more often reported that they had missed out on investment opportunities, more than twice as often as firms that don't consider competitors' plans at all. This may reflect that those cooperatives that do not gather extensive competitor information may be occupying market niches where it is not necessary because few expansion opportunities exist.

Firms that carefully considered their competitors' expansion plans reported having excess capacity problems almost twice as often as those that do not consider competitors' plans at all. Again, these firms may have been forced into a greater awareness of the need to gather competitor information by their experience of excess capacity.

Unprofitable investments were made by slightly fewer cooperatives that do not use discounting, multiple scenarios or consultants than by those that do. Cooperatives that use discounting, multiple scenarios or consultants reported missing out on investment opportunities almost twice as often as those that did not use more sophisticated analytical techniques. However, it may be that those inclined to do more extensive analysis of investments are also more aware of the opportunities they have missed.

Contrary to expectation, firms that use discounting, multiple scenarios or consultants reported experiencing serious excess capacity problems twice as often as cooperatives that do not use these tools for analyzing investments. Again, this may indicate that the experience of excess capacity has led some cooperatives to make a more thorough analysis of proposed expansions.

Although in many instances poor decision making practices were associated with undesirable investment outcomes, the opposite was also true, i.e., good decision making practices were also associated with undesirable outcomes. This may reflect the fact that the cooperatives that are more careful in analyzing investments are in industries with fiercer competition, higher stakes, or a higher degree of game-theoretic uncertainty in the decision environment. It may also indicate that problems in the past may have influenced the choice of decision making techniques currently being used. It is thus difficult to infer causality between the decision making practices used by respondents and the outcomes of their investment decisions.

4.5. Barriers to Investment Coordination by Cooperatives

The coordination of investments in industries in which farmer cooperatives participate is complicated by several characteristics of the industries themselves, the organization and goals of cooperatively owned firms, as well as characteristics of cooperative managers, members and directors. This chapter explored the effects of each of these on investment coordination.

First, the structural characteristics of agribusiness industries often make investment planning exceedingly difficult. Farmer-owned cooperatives have traditionally participated in low value-added commodity industries adjacent to farming, which means that they often

face highly volatile markets for their inputs and outputs. As one seasoned agribusiness lender commented,

> Agribusiness is so dynamic that you can't attempt to see what is coming next. When you are making major capital expenditure decisions, it is simply not possible to foresee accurately what government policies will be, what export markets will be like, and so forth. Instead, you just prepare for anything.

Second, several characteristics of cooperatively owned firms complicate the investment planning process. The stockholders of cooperatives are the major patrons, the return on investment is gained through patronage of the firm, and the firm is under democratic control. These characteristics of cooperatives have many implications for investment coordination, particularly in the areas of investment strategy, access to different types of financing, and governance of investment decisions.

Farmer-owned cooperatives pursue investment strategies that are often quite different from investor-owned firms in the same industries. There is a strong complementarity between investments at the farm level and those undertaken by cooperatives. Often the cooperative and members' farms are run as fairly integrated operations, rather than as completely separate profit centers. In addition, it is a common belief among cooperative managers that an important role for marketing cooperatives is to provide a marketing outlet for members' production, which may lead to a bias towards overinvestment by cooperatives if excess capacity exists at the farm level. The stockholder/patron identity results in a horizon problem for some cooperatives, and can create difficulties for these firms in raising new equity capital for financing an investment. In addition, the democratic governance structure sometimes complicates the investment decision making process, although most cooperatives do not feel the ownership structure of their firm greatly inhibits their ability to respond to investment opportunities. For the

majority of cooperatives, management and the board take the lead in analyzing investments, with very little direct member involvement. This accentuates the importance of the attitudes of management in decision making which results in a good match of industry capacity and demand.

A third factor impacting on investment coordination is the attitudes and selective perceptions of cooperative members, directors and managers. While the Texas A&M surveys described in section 4.3 focused on the attitudes of members and directors, this survey targetted managers. The majority of cooperative managers believe that large-scale preemptive capacity expansion is an appropriate strategy. Even though the majority of survey respondents had experienced competitors using such a strategy, few had reconsidered or abandoned expansion plans in response to a rival firm's preemptive strategy. When analyzing investments, most cooperative managers consider their competitors' expansion plans to some extent, relying mainly on customers for information about the capacity of their rivals as well as market growth. This common information source may contribute to convergent expectations among competing firms and contribute to a stable expansion of capacity.

Cooperative managers in general seem to be fairly unsophisticated in their use of financial analysis techniques in feasibility studies for major expansion projects, although the larger cooperatives exhibit a greater degree of financial sophistication. Often cooperatives ignore the cost of equity capital and simply use the cost of debt as the discount rate when analyzing the feasibility of a proposed expansion, which has the effect of making projects appear more profitable than they may in fact be. This bias may contribute to overexpansion in cooperative-dominated industries. The BCs clearly have a

role to play in improving the quality of cooperative decision making by demanding a more rigorous analysis of proposed investment projects.

Cooperative managers' own analysis of their failed investments, as well as their failure to invest when opportunities were available, reveals that their selective perceptions may have a large impact on industry-wide investment coordination. They acknowledged that game-theoretic uncertainty contributed to the failure of some investments. Most firms that had experienced unprofitable investments blamed the failure on lower-than-anticipated demand, although more than a third of them said that expansion by rivals was a factor in the failure of their investments to turn a profit. The most commonly cited reason that cooperatives fail to invest when an opportunity is available was that management was unaware of the opportunity. This given credence to Richardson's theory that the differential responsiveness of management is an important factor in investment coordination. Denial of credit by lenders appears to be a much less important coordinating factor.

It is very difficult to summarize the effects of all these characteristics on investment coordination. The same factors that facilitate coordination in one case may impede it in another. Many of the factors discussed here interact with each other, making it exceedingly difficult to measure the effects of a single factor on investment coordination in isolation from the others. Without a doubt, the most effective way of understanding how specific investment coordinating mechanisms work is to study them in the form of case studies of specific industries facing expanding (or contracting) markets. While such case studies are beyond the scope of this research project, they are a fruitful area for future investigation. This chapter was intended to analyze the characteristics of investment coordination that are unique to cooperatives, to describe how cooperatives

actually make capacity expansion decisions, and to provide background which will be useful in examining the Banks for Cooperatives' decisions to extend credit for capacity expansion.

Chapter 5

A COMPARATIVE ANALYSIS OF BANKING SYSTEM STRUCTURE AND INVESTMENT COORDINATION PERFORMANCE

The primary role of financial institutions in all economies is to serve as screening agents for the allocation of credit. Banking systems and financial (bond and equity) markets interact to determine which firms gain access to financing in order to undertake investments. Financial institutions (broadly defined) also have the responsibility of removing poor managements and directors and correcting their mistakes, a task which is done both by securities markets and by banks.

Banks are central to investment coordination. In particular, the decisions of bankers structure the interdependence of economic actors, and thus the magnitude and distribution of the fruits of economic activity. Even in economies with well-developed bond and equity markets, such as the United States and the United Kingdom, much of the activity in these markets involves the trading of existing assets. The stock market is a relatively unimportant source of funds for expanding firms. New companies generally raise capital through venture capital firms, while established companies finance their

investments through retained earnings or, if necessary, through bank loans and debt (Stiglitz, 1991, p.6).

In addition to relatively little capital being raised in equity markets, these markets are also less important than banks in allocating that capital among competing uses. As Joseph Stiglitz puts it,

> Equity markets are...a sideshow in the allocation of capital...Managers do not look to the stock market--to the views of the dentists in Peoria or the retired insurance salesmen in Florida--to determine whether another blast furnace should be built, or whether further exploration for oil should be undertaken. The stock price is relevant--they look to the effect on the stock market price. But it does not, and should not, drive their behavior. It simply provides too coarse information to direct investment decisions (p. 37).

The goal of this chapter is to compare different banking systems with regard to their ability to coordinate investments in order to gain some insights into how the Banks for Cooperatives might contribute to investment coordination. The central question considered here is which type of banking system is most effective at achieving the desired performance outcome, i.e., an efficient expansion of industry capacity.

5.1. Types of Banking Systems

In some countries, such as Japan and Germany, the relationships between banks and their borrowers are far more extensive than in the United States. In Germany, for example, banks have large shareholdings in the major commercial and industrial firms and seats on their supervisory boards. In Japan, banks are permitted to hold up to 5 percent of the shares of a firm. Collectively, Japanese banks own more than 22 percent of all corporate equity. This enables the banks to exert a far greater influence over the business decisions of their borrowers than banks in the U.S., which are strictly prohibited from holding corporate stock in their own investment portfolios.

Both the "universal" banking systems (i.e., those in which banks have broad corporate ownership powers) and more decentralized banking systems, such as that of the United States, have particular advantages and disadvantages. [1] Proponents of universal banking argue that when banks are allowed to hold the stock of the companies they lend to, and particularly when they have seats on their boards of directors, more extensive and accurate information goes into investment decisions. German and Japanese banks play a far more active role in shaping the investment strategies of industrial companies than U.S. or British banks, in part because they are able to use their knowledge of the investment plans of one borrower in guiding the decisions of another.

It is also argued that universal banking contributes to economic stability. Any capitalist system needs a mechanism for removing poor managements and correcting their mistakes. In Japan and Germany, this is done by the banks, rather than the stock market, as in the U.S. Corporate restructurings in the U.S. generally involve more dramatic cuts in employment and investment than in Japan or Germany, and are more disruptive to the rest of the economy. Because the stock markets in these countries are generally weaker than that of the U.S., hostile takeover bids are rare.

Universal banking may also result in a lower cost of capital, which further strengthens the dominance of banks over other sources of financing. Close informational linkages between banks and their borrowers are said to enable German and Japanese companies to safely carry much higher levels of debt than U.S. firms. This has the advantage of reducing the firms' cost of capital, since interest payments are tax deductible.

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[1] For a discussion of the pros and cons of the two types of banking systems and a debate of policies to change the laws governing U.S. banks, see David P. Hale, "Learning from Germany and Japan," Wall Street Journal, 2/4/91, p. A12 and Robert E. Litan, "The Dangers of Letting the Banks Own Everything," Wall Street Journal, 2/5/91, p. A18. A summary of their arguments is presented here.

Moreover, deposit insurance allows banks to raise funds more cheaply, giving an advantage to largely bank-financed firms.

Universal banking also allows commercial banks to attract the best managerial talent. Unlike in Japan and Germany, the best talent in the U.S. has flowed into other sectors of the economy. In Japan, especially, banks often send their own personnel to help manage financially distressed firms.

On the other side of the coin, a universal banking system may, by expanding the power of banks, allow them to facilitate oligopolistic pricing and cartel-like behavior, a charge that has been repeatedly levelled against banks in Germany. The decentralized banking system in the U.S. incorporates structural impediments to bank-sponsored oligopolies.

Another criticism of universal banking has been its lack of robust venture capital markets. The central role of banks in financing industry has resulted in stock and bond markets that are relatively weak. Such a system tends not to promote entrepreneurship and tends to maintain the current players in a market. Some argue that when the power of banks is restricted, securities markets become stronger, providing a ready source of funds to new and growing firms.

The main question in designing a financial system is one of balance. A goal of public policy should be to achieve the long-term investment horizons and coordination provided by bank-dominated capitalism, without losing the flexibility and entrepreneurship associated with a decentralized banking system and strong securities markets.

The remainder of this chapter will examine in greater detail the banking systems of Japan, Germany and the U.S. regarding their ability to coordinate investments. Finally, some observations will be made about the similarities and differences between the BCs

and universal banking systems, and questions will be raised about the role of the Banks for Cooperatives in investment coordination.

5.2 The Main Bank System of Japan

Japanese corporate groups, called keiretsu, are well-diversified alliances of industrial firms. The keiretsu are an important mechanism for vertical coordination of investments in the Japanese economy. Competition between the keiretsu places some limits on their ability to coordinate investments horizontally. All of the firms in a keiretsu have cross-ownership of equity and close ties to the group's "main bank," which provides the majority of the debt financing of member firms. The keiretsu are descended from the zaibatsu, ten large, family-affiliated industrial groups which dominated the Japanese economy until the end of World War II, when they were dissolved by the Allied Occupation forces (Genay, 1991).

A common characteristic of these groups is the central role of financial institutions. The long-term ties between keiretsu banks and other members of the group are thought to have played a large role in the orderly expansion of Japanese industry. The power of these banks was enhanced by regulations that restricted the size of corporate bond markets in Japan, at least until the late 1970s, resulting in banks being the main source of external funds for corporations. Although banks are only allowed to hold a maximum of 5 percent of the equity of any one company, the interlocks among keiretsu firms extend the banks' influence over the capacity expansion process. Financial institutions (including insurance companies) own about 40 percent of the total outstanding stock of Japanese companies (Aoki, 1989).

A firm may have ties to a number of banks, but there are two features which distinguish the main bank relationship: the bank's provision of the majority of the firm's credit needs, and the bank's holding of equity in its borrower. The "main" bank is the one that maintains the largest share of a firm's loans among private financial institutions. It has the closest ties to the firm in terms of its cash management, as well as its short-term and long-term credit needs (Aoki). The main bank has no official or legal status as such, and the bank and the firm are commercially independent entities. Sheard (1989) calculated the average loan share of the main bank to be 25 percent of the firm's total bank borrowings. Moreover, the main bank is generally one of the firm's principal shareholders. It is usually among the top five shareholders, if not the largest or second largest.

Hesna Genay (1991) reviews the economic roles of the keiretsu system. First, the keiretsu may act as cartel-like organizations that coordinate actions to limit competition and earn monopoly rents. A second theory is that the keiretsu system facilitates the sharing of industry-specific shocks among all the firms in the group, stabilizing their earnings and minimizing the costs of the shock to any one company. A third theory regarding the economic role of these corporate groups is that they reduce the effects of agency costs and asymmetric information. This is accomplished through monitoring and intervention by the main bank. Sheard examines in greater detail the informational role of the main bank.

In well-functioning main bank relationships, the firm consults the bank when preparing business plans and regularly reports to the bank on its performance. This exchange of information is often formalized by the main bank having a director link with its borrower, or through membership in a bank-sponsored "presidents' club."

Sheard found that in 1985, the 1,820 listed firms in Japan had 1,721 directors who were formerly or concurrently bank executives (about five percent of total directorships). About half of the listed firms that had bank borrowings in 1980 had at least one representative on their board from their main bank.

Presidents' clubs, although they have no formal decision making power, provide a forum for the exchange of information and coordination of decision making. Each of the six bank-centered keiretsu sponsors these meetings, at which top executives of the leading financial and industrial firms converge to discuss business strategies.

The close ties between main banks and their firms result in the banks functioning as screening and monitoring institutions, substituting for other institutions, such as bond and credit rating services, that are less well-developed in Japan than in the U.S.

Sheard notes that two characteristics of the Japanese economy contribute to the importance of the monitoring role of the main bank. First, standards of corporate accounting and disclosure in Japan are poor relative to other industrialized countries. External auditing is much less common in Japan than in the U.S., and assets are generally recorded at historical, rather than current values, limiting the usefulness of financial reports. Given this situation, the main bank system has an important role in auditing corporate performance.

A second aspect of the Japanese economy that is important in understanding the role of the main bank is the highly internalized managerial labor market. Firms tend to hire managerial employees right after graduation and promote them internally. The high degree of firm-specific skills in the managerial labor pool makes human capital an immobile asset, reducing the effectiveness of capital markets in monitoring managerial performance. As a consequence, Japan has not developed a market for corporate control

through stock transactions as in the U.S. Instead of being resolved through capital market transactions, changes in management are effected through administrative decisions by the main bank.

Sheard makes the argument that the main bank system evolved as a way of reducing the economic costs of duplicative monitoring of firms. By specializing monitoring activities among a small subset of banks, the task of monitoring is less costly. Although several banks may lend to the firm, monitoring is usually done by the bank with the largest loan share and the highest equity stake in the firm. Although it may be economical for one bank to do the monitoring, the bank will want to limit its risk by not supplying all of the firm's credit needs, and the firm will want to limit risk by diversifying its sources of bank financing.

Sheard asserts that main bank intervention in firm management provides an important substitute mechanism for the missing takeover market in Japan. The belief that the main bank will look after its borrowers if they experience financial difficulties is a mainstay of Japanese business ideology. However, normally the main bank does not get explicitly involved in the management of the firm. In good profit states, banks remain as silent business partners.

In the event a firm has a financial problem, intervention by the main bank may come in several forms. In some cases, intervention is very subtle. The bank may simply require the firm to modify its business plan. In other cases, the intervention may be more dramatic. A bank may send in its own executives to supervise the firm's management or to manage the firm themselves. A main bank may provide emergency assistance in the form of reductions or exemptions of interest payments during an adjustment period, and often arranges mergers or joint ventures between the troubled company and another of

the bank's affiliated firms. Other assistance may include rescheduling of loan payments, emergency loans, advice for the liquidation of some assets, the facilitation of business opportunities, or corporate reorganizations.

The main bank, because it is the major cash-manager, creditor and stockholder, is in a position to detect problems early. Aoki notes that, in contrast, at the time of its near-bankruptcy, Chrysler was in debt to about 400 banks, and no one bank was aware of the magnitude of the problem until it reached the crisis stage.

Because of asymmetries of information between management and shareholders, opportunistic behavior may limit the effectiveness of the external corporate takeover as a mechanism for shareholders to control management. Hostile takeovers are almost unheard of in Japan, because the managements of large firms insulate themselves from the discipline of the stock market by ensuring that the majority of shares are held by long-term transaction partners with a common main bank, as well as by the main bank itself.[2] The main bank functions as an internal capital market, with control of management accomplished through an administrative, rather than a market, mechanism.[3]

Sheard also examined the role of the main bank as a residual risk-bearer among a firm's security holders. Main banks provide a large share of the assistance given to failing

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[2] Aoki (1989) notes that individual stockholders own about 30 percent of corporate equity and have no effective voice in the corporate governance structure.

[3] However, in the last few years the pendulum may be swinging away from bank discipline of management. The tremendous success of Japanese firms in product markets around the world, coupled with the reduction in good investment opportunities, has led these firms to hold high levels of cash and to reduce their dependence on bank borrowings. The higher degree of internal financing, combined with freer access to global capital markets in recent years, have led Japanese industrial firms to distance themselves from the banks that own and lend to them. The ability of lending institutions to monitor borrowers and take corrective action is reduced, and some argue that the development of a market for corporate control--complete with Western-style hostile takeover bids--will soon follow (Kester, 1992).

firms, which often involves large-scale interest subsidies. Sheard suggests that residual risk-bearing is part of an incentive structure that economizes on the agency costs of delegated monitoring relationships between main and non-main banks.

The fact that the main bank bears a larger share of the financial burden when a firm requires assistance may reflect its need to send credible signals to other creditors of the firm. There may be concern on the part of other lenders that the main bank's vote of confidence in the firm might be designed to minimize its own losses after deciding that the firm's prospects are bad. The main bank bearing a disproportionate share of the burden may be an effort to make its signals to the other banks more credible.[4]

To summarize, the main bank system facilitates investment coordination by concentrating the functions of corporate monitoring and control in the hands of specialized agents whose relationship to the firm is one of partial vertical integration, with banks and their borrowers (at least in financial health) maintaining separate decision making. This is an intermediate form of economic organization that, like cooperatives, falls between the two extremes of markets and hierarchies and suggests some themes for examining the coordination functions of the Banks for Cooperatives.

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[4] It may also reflect the fact that Japanese banks are permitted to count up to 45 percent of the unrealized capital gains on their stockholdings as part of their capital. The banks thus have an interest in attempting to correct their borrowers' problems quickly to prevent their capital base from eroding. See "A Shortage of Capital Around the Globe Worries Top Finance Ministers," Wall Street Journal, 9/21/90, p. A1.

5.3 The West German Banking System[5]

Because of capital market limitations similar to those of Japan, the German banking system provides practically all outside capital to German industry. German stock exchanges have historically been weak, with most companies financing the bulk of their capital expenditures by retained earnings. As profits declined and capital needs increased in the late 1950s and early 1960s, the debt load of German firms increased, and banks began to assert control over industry (Seikman, 1969). Cable (1985) reported that bank borrowing accounted for approximately 20 percent of the external financing needed by German firms, with two-thirds of this in the form of long-term loans. This results in a heavy flow of information to and from the banks regarding corporate plans and performance.

The banking system has been dominated by three large banks that do both commercial and investment banking. Banks also control the stock market, as only bankers historically have had the right to buy or sell stock for individual investors. Each of the three large banks has a significant ownership stake in many of the country's largest firms. The banks use their ownership links to their borrowers to achieve investment coordination through significant direct control over firm decisions.

Bank control over the voting rights of the stock of industrial firms has two sources. Their control derives partly from direct shareholdings and partly from the right to vote by proxy the shares they hold for their depositors. Most securities, which are bearer shares, are kept on deposit at banks. Most shareholders do not instruct their banks on how to vote at annual meetings, so the banks' officers vote as they see fit. Cable reported that

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[5] This material does not reflect the status of the banking system after the reunification of East and West Germany.

the proportion of voting rights controlled through direct holdings is small, about five percent for the top 100 companies in 1978. However, when the proxies are added, the overall proportion of votes controlled by the banks was about 36 percent. For the ten largest companies, bank control exceeded 50 percent.

Along with the banks, the German labor movement has had a large influence on investments. Unions have ownership ties with the country's largest banks and, since the "co-determination" laws of the mid-1970s, have parity representation on the supervisory boards of industrial firms. A consensus must be continually forged between the unions, corporate management, and the banks with regard to the expansion of productive capacity.

Proponents of German-style universal banking point to the system's successes in fostering economic stability by keeping companies afloat during recessions and saving them from foreign takeover.[6] The recession of the mid-1970s hastened a structural shift in the German economy away from labor-intensive mass production and toward high-value, high-technology production. German banks took a lead role in the restructuring of German industry, while at the same time minimizing their own loan losses.

However, some argue that this degree of investment coordination is achieved at a high cost. There is a potential conflict of interest in how German banks are run. It is common for a major bank to own significant shares of competing companies, with bank representatives on their supervisory boards. Although this clearly facilitates the sharing of investment plans and thus promotes coordination, it also facilitates joint profit maximization and mergers, leading to a weakening of competition and higher prices for consumers.

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[6] See "The German Example: Three Rich, Powerful Banks Dominate the Economy," Business Week, 4/19/76.

German bankers argue that there are some checks on their power. Competition between the three major banks limits conflicts of interest to some degree. Moreover, German companies list outstanding credits and interest rates from each bank in their annual reports. If a company showed a pattern of paying more at one bank, directors not associated with this bank would protest. Bankers argue that this protects a company from undue pressure from a bank.[7] However, it also preserves the current sources of financing in the same balance.

The argument has also been made that German industry has not had access to a broad and deep capital market like that of the U.S. Under a universal banking system with significant bank ownership of firms, banks may be unwilling to lend to new entrants into a market who intend to compete with firms in which they have ownership stakes.

In a 1985 study based on data from 1978, John Cable attempted to measure the effects of bank participation on industrial firm performance in Germany. Profitability was expected (and found) to be higher where there was a close relationship between the bank and the company, because the bank, through its network of representatives, could facilitate cartel relationships and monitor their effectiveness. Cable found a significant positive relationship between the degree of bank involvement and a firm's financial performance, suggesting that a German-style universal banking system does facilitate joint profit maximization by competing firms.

In summary, a banking system which allows banks and their borrowers to have strong ownership ties facilitates the goal of investment coordination, but may permit abuses of power to occur, although in the German case the power of the banks is checked to some extent by the presence of labor unions on the supervisory boards of companies.

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[7] See source mentioned in previous footnote.

The economic outcome of what Cable refers to as a "quasi-internal capital market" will depend also on the degree of competition the banking system receives from other sources of credit to firms.

5.4. The Decentralized Banking System of the United States

Before the Glass-Steagall Act of 1933, which transformed the U.S. banking system, American banks were evolving toward a system much closer to the German and Japanese models than the one we have in place today. David P. Hale (see footnote 1) cites a recent study by the National Bureau of Economic Research, which found that before 1914, America's leading banks had a system of ownership linkages and interlocking directorates with the railroads and major manufacturing firms as closely knit as the Japanese keiretsu. In a 1978 study entitled Bank Control of Large Corporations in the United States, David M. Kotz noted that the rise of bank control of U.S. railroads in the 1890s led to the substitution of J.P. Morgan's "community of interest" principle for rigorous competition.

It has been argued that the linkages between banking and industry during the 19th and early 20th centuries were an important explanation for the rapid economic development of the United States (Golembe, 1986). Banking and commerce were not as rigidly separated as they are today, and traces of this early close relationship are still evident in the words that frequently appear in the names of American banks, such as "Railroad," "Farmers and Merchants," "Chemical" or "Boatmen's."

The close links between banks and companies contributed to the health of the banks as well as the growth of the companies. When the Mellon family built a small private bank into one of the country's major financial institutions by loaning money to

struggling new companies in exchange for stock ownership, it relied on some of the businesses it owned and financed to provide information useful in its credit decisions. For example, although the bank grew by selling off companies, it never sold Carborundum, a service company for almost the entire capital goods industry. By monitoring weekly fluctuations in the inflow of orders for Carborundum's abrasive grinds, the bank was able to predict changes in the economy in an era when reliable economic indicators were scarce (Murphy, 1967).

Prior to the omnibus banking legislation of 1933, commercial banks, in addition to being interlinked with their borrowers, were actively involved in investment banking. However, the collapse of financial markets in 1929 disclosed evidence of deceptive practices by banks. For example, some banks attempted to unload their bad loans onto the unsuspecting public in the form of shares or bonds (Golembe and Holland, 1986). Therefore, one goal of the Glass-Steagall Act was to separate the investment banking business from commercial banking. However, the divorce was incomplete. Banks were still permitted to deal in U.S. Treasury securities, as well as state and municipal bonds, and to offer securities brokerage services for their customers. Erosion of the barrier between investment and commercial banking has taken place over time, largely through regulatory decisions by the Federal Reserve Board granting banks additional powers.

Investment coordination by banks in the United States involves two issues. First, the bank must have access to the investment plans of competing firms, and second, the bank must be able to use that information to guide its borrowers' investment strategies. Access to information about the investment plans of competing firms depends in part on the competitive structure of the U.S. banking system. Geographic limitations on branching and mergers have lead to a very decentralized structure, with over 12,000 commercial

banks currently in existence. Moreover, the Glass-Steagall Act strictly prohibits banks from owning corporate equities in their own investment portfolios, limiting a potential source of investment information.

In addition to impediments to the flow of information, there are also legal restrictions on the banks' ability to use it. Creditors that participate in the management of a company lose the priority of their claims in bankruptcy proceedings. Moreover, they may also be held liable for the borrower's losses.[8] Judicial interpretations of the Glass-Steagall Act's wall separating commercial and investment activities have also placed specific limits on bankers' ability to use information gained from trust accounts in lending decisions, as well as information gained from monitoring borrower accounts in the investment decisions of trust departments.

The flow of information within banks, especially between trust departments, which manage the investment portfolios of others for a fee, and commercial lending departments, is a source of potential conflicts of interest. As lenders, banks are often aware when one of their borrowers is in financial trouble and in risk of defaulting on a loan. The bank should use this information to monitor the status of the loan and to develop a plan for corrective action. However, a conflict of interest arises if the bank's trust department holds the stock or other securities of the troubled firm. The trust department is legally obligated to act in the best interest of trust beneficiaries, which suggests that it should sell the firm's stock on the basis of insider information. If the trust department sells the stock,

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[8] Several lender liability suits in California in the late 1980s involved farmers charging banks with fraud and breach of promise when loans were called in. See Richard B. Schmitt, "Farmers, Attacking Lending Practices, Are Taking Banks to Court and Winning," Wall Street Journal, 6/6/87, p.6.

it violates laws prohibiting insider trading, but if it doesn't sell the stock, it is breaching its legal obligation as a trustee and may be subject to civil damage suits.

The courts have resolved this dilemma by ruling that the use of insider information is strictly prohibited, regardless of the bank's position as trustee. Moreover, the federal bank regulatory agencies require that banks under their jurisdiction develop internal written policies that establish an information barrier, commonly called a "Chinese wall," between the lending and trust departments. The elements of a "Chinese wall" vary among banks, depending on the size of the bank. A large bank's "wall" will often include: 1) physical separation of the loan and trust departments, 2) legal separation of the trust department from the rest of the bank to form a different corporation to handle only trust activities, 3) policies authorizing only certain types of communication between loan and trust departments, 4) policies prohibiting trust officers from sitting on a bank's committees where credit matters are discussed, and 5) prohibitions on the use of information gained from bank officers or directors servings as directors of other companies (Brick, 1984, p.118).

However, the courts have dismissed the need for a "Chinese wall" within loan departments by ruling that banks are free to use internally any information they may have about a borrower as long as it is not passed to trust officers or other firms. This ruling effectively permits banks to coordinate investments through their decisions to extend or deny credit, as long as insider information is not disseminated to anyone outside of the loan department (Brick, 1984, pp. 100-101).

However, conflicts of interest within loan departments still arise, and seem to be increasing in this era of corporate takeovers. Banks may be lured by fee income into financing mergers and acquisitions, often involving two or more of their own borrowers.

This can be especially problematic when takeovers are hostile, as the bank must side with one client against another.

Conflicts of interest also arise within trust departments, which face few regulatory restrictions on their investment decisions. If a bank's trust department holds significant shares of the leading firms in an industry, it may be in a position to encourage joint profit maximization by the firms, which would increase the bank's income as the trust department is a claimant of the companies' profits. Kotz (pp. 133-34) gives the example of Cleveland Trust, which held stock in the four major producers of automatic screw machinery. Cleveland Trust had a representative on the board of each company, and did a substantial banking business with all four. Together the four firms represented about half of the industry's sales in the U.S. The Department of Justice filed a civil antitrust suit in 1970, arguing that Cleveland Trust's active intervention tended to lessen competition among the four companies. The case was settled five years later by a consent decree which did not address the central issues of the case. However, Cleveland Trust officers were prohibited from sitting on the boards of three of the companies.

Although, for obvious reasons, bankers deny exerting influence over companies that their trust departments hold stock in, they acknowledge they may try to influence their loan portfolio companies. In Congressional testimony a senior executive of one of the largest U.S. banks was asked whether his bank was more likely to exert pressure on management of a company in debt to the bank or a company in which the bank held a large block of stock. The banker replied that it was much more likely to pressure a borrower. If the bank held a firm's stock and disagreed with a course of action, the trust department would simply sell the shares. On the other hand, the bank would be more likely to seek to influence a company to whom it had made loans because, with the

exception of some mortgages, no liquid market exists for bank loans. Because the bank cannot sell off a problem loan, the only recourse left is to pressure the borrower.

In the U.S. banking system, although the powers of banks are much more restricted than under universal banking systems, coordination of investments can and does occur. However, banks do not openly seek to influence the investment strategies of their borrowers to the same degree as banks in Japan and Germany. A survey by the Securities and Exchange Commission disclosed that between January of 1968 and September of 1969, less than one fourth of the commercial banks surveyed admitted to informally participating in corporate management (Kotz, p. 127).

One significant result of the restrictions placed on bank participation in firm management is that the stock market has become a much more important source of discipline on the behavior of corporate management. From the perspective of the Japanese, the corporate takeover market acts as a substitute for the "missing" powers of U.S. banks. This observation suggests that the lack of a secondary market for cooperative stock may result in the Banks for Cooperatives playing a critical role in investment coordination.

5.5. The Banks for Cooperatives' Structure and Investment Coordination

The Banks for Cooperatives, as part of the U.S. financial system, are subject to some of the same laws and regulations as commercial banks in the U.S. However, they were created as part of the cooperative Farm Credit System, and have a different ownership structure and regulating agency than commercial banks. In many ways, the BC system resembles the universal banking systems of Germany and Japan more than the decentralized system of the U.S. However, the cooperative structure of the BCs also

embodies some important differences, which have implications for investment coordination performance.

In Germany and Japan, the relative weakness of the stock markets accentuated the power of the banking system to coordinate investments. Similarly, the absence of a secondary market for cooperative stock enhances the importance of the BCs in coordinating the investments of cooperatives. As in the case of Germany, the BCs' position as dominant lender to a segment of agribusiness industries contributes to their potential coordinating ability.

The cooperative credit system in the U.S. is similar to Japan in that accounting standards do not facilitate external evaluation of financial performance. Many lenders and other financial analysts do not understand the unique financial aspects of the cooperative ownership structure. This increases the importance of the BCs' role in auditing firms' performance. Valuation of assets at current rather than historical levels is made more difficult by the lack of a secondary market for cooperative stock.

Similar to Japanese banks, BCs have a strong role in monitoring managerial performance. Cooperatives do not have a takeover market to act as a source of discipline on management, so the importance of bank monitoring is enhanced. However, the BCs lack the means of intervening in firm decision making that are available to German and Japanese banks.

BC control over the investment decisions of its borrowers is checked by two factors: 1) the cooperative nature of bank ownership, and 2) the ability of borrowers to secure financing from other sources. Factors affecting the BCs' ability to maintain a high share of the cooperative credit market will be discussed in greater detail in the next chapter.

The fact that the BCs are cooperatively owned has important implications for their ability to coordinate investments. Borrowers of the BCs (i.e., members of a credit cooperative) remain independent profit centers, making their own investment and production decisions. Moreover, unlike in Japan, the ownership linkages between bank and borrower are uni-directional. The borrowers own the banks, but the banks do not own the borrowers. The BCs are a vertical integration of cooperatives backward to provide for their own credit needs.

Unlike the universal banking systems of Germany and Japan, in which banks are permitted to hold the stock of their borrowers, in the BC system, the borrowers own the bank. The bank exercise of control over its borrowers takes far more subtle forms than the voting of stock, as in the German case, or the replacement of management by bank executives in the Japanese case. However, BC control over borrowers may involve more than the simple extension or denial of credit. Because the borrowers have the right to influence bank policies, bank management sometimes achieves its own goals through the selective withholding of information from the borrower/owners and subtle techniques of persuasion. For example, one BC employee recounted the story of how the management team at his bank got the board of directors to agree to a major change in loan pricing policy. Directors were presented with a barrage of information and were first asked to pass judgment on a number of other issues, so that by the time the loan pricing policy came up, the directors were tired and passed it without fully understanding the significance of what they were voting on.

Although the BCs do not have the degree of direct control over the management of borrowing firms that universal banks do, they do act to influence management decisions. They may refuse to make a loan if they feel that the borrower's management is

too weak to handle the complexity of a given project, or they may revise certain aspects of the project to be more in line with what the cooperative's management can handle.

Also, all loans are demand notes--the bank may call them at any time if the borrower breaks any part of the loan covenant. However, this right of the bank is rarely exercised. Bank management prefers to use this threat as leverage in getting the borrower to change some aspect of its business. Persuasion is necessary because a cooperative is a coalition of independent firms. Therefore, BC management must be far more political and sensitive to borrowers' needs than the management of an investor-owned bank must be. Although the BCs have the same degree of access to borrowers' investment plans as universal banks, the BCs are less likely to promote cartel behavior among borrowers than universal banks are because of their ownership structure. The outcome will depend on the balance of power between BC borrowers and their ability to influence the lending decisions of BC officials, as well as competitive pressures from other lenders.

The next three chapters will examine the BCs' access to investor information and limitations on the ability of BC management to effectively use it to coordinate industry capacity with long-run demand. For the survival of the BCs themselves, tight coordination is imperative. Because they lend to firms predominantly in low value-added industries employing immobile assets, the cost of investment mistakes is higher to these firms. Moreover, because the BCs have limited ability to reduce default risk through diversification of their loan portfolios, their survival depends on successful investment coordination.

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THE ROLE OF THE BANKS FOR COOPERATIVES IN COORDINATING INVESTMENTS IN INDUSTRY CAPACITY

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Chapter 6

THE BANKS FOR COOPERATIVES' SHARE OF THE CREDIT MARKET FOR FARMER COOPERATIVES

The Banks for Cooperatives may influence investment coordination in numerous ways, which will be discussed in greater detail in the next two chapters. Three things are necessary for the BC's to successfully coordinate investments through their credit decisions: 1) they must provide a large share of the credit used by cooperatives, 2) their cooperative borrowers must have a large market share, and 3) the BC's must effectively use the information they receive from monitoring borrower accounts to guide the investment decisions of other borrowers wishing to expand. This chapter will examine the first two requirements, in particular the determinants of BC market share, and the next chapter will examine how the banks use borrower information to coordinate investments.

6.1. Trends in BC Share of Cooperative Debt

The Banks for Cooperatives provide more than half of the debt financing used by cooperative firms. However, the BC share has been trending downward over the past two decades. According to the annual survey of the 100 largest cooperatives by the Agricultural Cooperative Service, in 1970, the BCs provided 64 percent of the 100 largest

cooperatives' debt capital. By 1980, this figure had fallen to 58.4 percent. The downward trend continued during the 1980s, and by 1989, the BCs provided 47.4 percent of outstanding cooperative debt. In 1990, the downward trend reversed itself and the BCs supplied 53 percent of the debt financing of the 100 largest cooperatives. This figure fell slightly to 51 percent in 1991. The BCs are still the dominant source of financing for cooperatives, providing at least three times as much long-term as well as short-term debt than the next leading source (Davidson, 1989).

A different picture is obtained when the BC credit market share is broken down by major industry groupings (Table 6.1). The BCs provide a much higher percentage of total debt in some industries than in others. For example, according to the ACS survey of the 100 largest cooperatives, they account for 89.3 percent of total debt for poultry and livestock cooperatives that are among the 100 largest in the country. The BCs provide 80.1 percent of the total debt of grain cooperatives, 75.5 percent in dairy, 74 percent in rice, and 65.8 percent in fruits, vegetables and nuts. The BC share may be even higher in more narrowly defined geographic or product markets. BC share also may be higher for specific types of bank product offerings, such as fixed-rate term loans or seasonal operating credit.

When the BCs' share of financing for the industry groups noted in Table 6.1 is matched up with the cooperatives' share of product markets, a more complete picture of the BCs' coordinating potential emerges. Although the BCs supply 89.3 percent of the debt financing needs of livestock and poultry cooperatives, those cooperatives are a relatively small part of livestock and poultry markets. The cooperative market share is 12 percent in broilers, 18 percent in turkeys, 17 percent in hogs, and 10 percent in fed beef (Table 6.2), lowering the BCs' investment coordination potential in those industries.

Table 6.1

BC Share of Total Debt of the 100 Largest Cooperatives by Commodity Group, 1991

Commodity Group	Cooperatives	Debt Held by BCs	Total Debt	Total Equity	D/E	BC/ TD
	number	$ in thousands			%	%
Fruits, Vegetables & Nuts	20	1,023,363	1,556,026	1,143,742	65.8	65.8
Farm Supply	14	618,333	1,371,536	2,361,841	45.1	45.1
Dairy	32	512,417	678,693	1,167,548	75.5	75.5
Grain	13	355,103	443,382	738,106	80.1	80.1
Diversified	4	314,746	1,486,693	898,265	21.2	21.2
Sugar	5	114,134	244,187	260,966	46.7	46.7
Rice	3	101,275	136,818	192,630	74.0	74.0
Cotton	5	72,100	232,032	186,059	31.1	31.1
Poultry & Livestock	4	60,948	68,279	57,147	89.3	89.3
TOTAL	100	3,172,419	6,217,646	7,006,304	51.0	51.0

Source: Special tabulation by the Agricultural Cooperative Service of data from the 1991 survey of the 100 largest cooperatives.

Table 6.2	
Market Share of Cooperatives	
Commodity	Cooperative Market Share
Marketing Cooperatives:	
Milk	68
Broilers	12
Eggs	2
Turkeys	18
Hogs	17
Fed Beef	10
Wheat	57
Rice	59
Feed Grains	40
Soybeans	46
Cotton	30
Fresh vegetables	7
Processing vegetables	20
Citrus fruits	67
Other processing fruit	65
Other fresh fruit	40
Farm Supply:	
Feed	16
Fertilizer	44
Petroleum	44
Chemicals	29
Seed	15
Machinery	2
Sources:	Knutson, Penn and Boehm. 1983. Agricultural and Food Policy, p. 246. USDA, ACS Service Report No. 17, 1986.

The BCs have greater potential for investment coordination in industries where cooperatives have a large presence and rely heavily on the BCs for financing. Because the smaller cooperatives rely more than the larger ones on obtaining financing from a BC, the banks' coordination potential is greatest in industries with a large number of smaller

cooperatives, as well as in industries which rely more heavily on debt, rather than equity financing, such as cotton, fruits, vegetables, nuts, poultry and livestock. (See Table 6.1).

The BCs provided 80.1 percent of the debt financing needs of grain cooperatives, which in turn account for 57 percent of wheat, 40 percent of feed grains, and 46 percent of soybeans marketed in the U.S. For the dairy industry, the BCs provided 75.5 percent of the top 100 cooperatives' debt financing, and cooperatives account for 68 percent of milk marketed. Rice cooperatives, which have a 59 percent market share, get 74 percent of their debt financing from the BCs. The potential for the BCs to coordinate investments in these broadly defined industries should be fairly high, but may be higher or lower under more precise market definitions. On the other hand, cooperatives have about a third of the market for farm inputs, and the BCs supply 45.1 percent of the debt financing needs of those in the 100 largest group. Moreover, these large regional farm supply cooperatives do not rely as heavily on debt financing as those in other industries. However, at the local level, the BCs have a much greater influence on farm supply cooperatives.

While industry percentages give some indication of the BCs' potential for horizontal coordination, their ability to vertically coordinate investments depends on the percentage of the vertical marketing chain from farm to consumer that is under control of cooperatives and thus eligible to borrow from the BCs. Vertical coordination by cooperatives is highest in products where there are tight relationships between local, regional, and interregional cooperatives, and the BCs are the dominant lender at each level. BC influence on vertical coordination may also be high in products where a single committed integrated marketing cooperative controls the marketing chain because it has been able to develop national brands. For example, BC coordination of investments in

adjacent stages of the vertical production sequence is likely to be highest in milk, rice, citrus, and processing fruits and nuts.

Table 6.3

1991 Sources of Borrowed Capital for the 100 Largest Cooperatives

Source of Debt	No. using source		Debt outstanding from each source		Total Debt	Percent of Total
	Short-term	Long-term	Short-term	Long-term		
	Number		Millions of dollars			Percent
BCs	50	70	1,154.9	2,017.5	3,172.4	51.0
Bonds, notes & certificates	20	30	308.4	656.6	965	15.5
Comm'l banks	10	26	179.2	221.2	400.1	6.4
Insurance co's	---	17	---	486.9	486.9	7.8
Capital Lease Obligations	---	27	---	332.5	332.5	5.3
Ind. Dev. Rev. Bonds	---	38	---	252.7	252.7	4.1
Other non-financial entities	5	20	75.1	133.1	208.2	3.3
CCC & Other Gov't sources	4	2	40.7	0.4	41.1	0.7
Other sources	6	31	14.7	119.7	134.4	2.2
TOTAL DEBT			1,997.0	4,220.7	6,217.6	100

Source: Agricultural Cooperative Service, 1991 survey of the 100 largest cooperatives.

6.2. Alternative Sources of Financing Available to Cooperatives

The relative share of cooperative debt financing supplied by the BCs will depend on their competitive position relative to other lenders. Table 6.3 presents a breakdown of

the sources of borrowed capital for the 100 largest cooperatives in 1991. Characteristics and trends of each source will be discussed in turn.

6.2.1. The Banks for Cooperatives

The three Banks for Cooperatives are the source of about half of the debt of the 100 largest cooperatives. The banks offer seasonal operating credit as well as long-term loans at both fixed and variable rates. The BCs are able to cover any size of loan and are very flexible in designing loan packages to meet the special needs of their borrowers. In 1991, the BCs provided 57.8 percent of the short-term borrowings of the 100 largest cooperatives, and 47.8 percent of their long-term debt, which is typically used to finance capital expenditures.

6.2.2. Bonds, Notes and Debt Certificates

Debt securities provide another source of funding for cooperatives. Long-term securities are often sold through private placement, which is the direct sale of securities by a company to one or more investors, usually life insurance companies or other institutional investors. They may be secured or unsecured notes with fixed interest rates and maturities of roughly 5 to 20 years. In 1991, bonds, notes and debt certificates accounted for 15.4 percent of the 100 largest cooperatives' short-term debt and 15.6 percent of their long-term debt. These debt instruments rank second in importance to the BCs as a source of debt capital. Their share decreased slightly during the 1980s, but has increased in the past year.

6.2.3. Commercial Banks

Commercial banks offer cooperatives products that are very similar to those offered by the BCs, as well as a few services, such as back-up financing for industrial revenue bond issues, that the BCs do not offer. In 1991, loans from commercial banks

accounted for nine percent of the 100 largest cooperatives' short-term debt and 5.2 percent of their long-term debt. The share of cooperative debt supplied by commercial banks has risen slightly during the latter half of the 1980s.

6.2.4. Insurance Companies

Insurance companies provide loans to cooperatives, all of which are long-term in nature. In 1991, loans from insurance companies constituted 11.5 percent of long-term debt capital for the 100 largest cooperatives. This figure has increased in recent years, up from 8.4 percent of long-term debt in 1986.

6.2.5. Capital Lease Obligations

Leasing is a financing mechanism that is especially well-suited to the expansion of a cooperative's asset base. The leasing of assets can be arranged through many leasing companies, a cooperative leasing cooperative, or commercial banks. Capital lease obligations accounted for 7.9 percent of long-term debt financing for the 100 largest cooperatives in 1991. The use of leases has increased slightly in recent years.

6.2.6. Industrial Development Revenue Bonds

Industrial development revenue bonds provide long-term financing, and are particularly suited for the expansion of assets. The maturity of the bonds can be made to match the useful life of the asset being financed. The interest on an industrial revenue bond is tax exempt, but since the tax law changes in 1986 which repealed the investment tax credit, there has been a large decrease in the number of IRBs being issued. In 1988, IRBs accounted for six percent of long-term debt for the 100 largest cooperatives.

6.2.7. Other Non-Financial Entities

Other non-financial entities, both cooperatives and non-cooperatives, provided 3.8 percent of short-term debt and 3.2 percent of long-term debt for the 100 largest cooperatives.

6.2.8. CCC and Other Government Sources

Loans from the Commodity Credit Corporation and other government sources accounted for 11.2 percent of short-term debt and no long-term debt in 1991.

6.2.9. Commercial Paper

In the last few years, large cooperatives with high credit ratings have begun issuing their own commercial paper. These are short-term, unsecured notes with maturities ranging from a few weeks to 270 days. In 1991, the 100 largest cooperatives obtained 11.2 percent of their short-term debt in the commercial paper market.

6.2.10. Other Sources

In 1991, other sources provided 0.1 percent of short-term debt capital and 2.8 percent of long-term debt capital for the 100 largest cooperatives.

To summarize, the Banks for Cooperatives provide large cooperative firms with the majority of their long-term debt capital, more than three times the amount provided by cooperatives' issuance of bonds, notes and debt certificates, which was the next leading source. The BCs provided over eight times the amount that was loaned by commercial banks, five times the amount provided by leases, and more than six times the amount provided by industrial revenue bonds. Clearly, the ACS figures show that the BCs are the dominant lender to the 100 largest cooperative businesses.

6.3. Survey Results on BC Market Share

The survey of the 290 largest cooperatives undertaken as part of this research yielded somewhat different results from the ACS survey of the 100 largest. Although it confirmed that the BCs are the dominant lender to the cooperative sector, the credit market share figures for commodity groups were somewhat different, and are discussed below.

Table 6.4

Desirability of Various Sources of Credit for Capacity Expansions (Ranked Data)

II.1. When seeking long-term credit to finance a capacity expansion, which of these sources would you be most likely to consider? (rank only those that you would consider)

Source	Percent who ranked it 1 [1]	Percent who ranked it 1 or 2 [1]	Valid cases [2]
Banks for Cooperatives	81.8	93.4	121
Bonds, notes, & debt certificates issued to members	13.2	62.3	53
Commercial banks	21.2	63.5	85
Insurance companies	7.9	26.3	38
Capital lease obligations	8.2	38.8	49
Industrial development revenue bonds	11.3	28.3	53
Other:_____ [3]	42.9	85.7	7

[1] Percentages are based on the number of respondents who would consider each source.
[2] Valid cases are the number of respondents who would consider each source.
[3] The category "other" includes: private placement of debt securities, contract purchases with the seller of the assets, as well as financing from regional cooperatives, capital financing companies, and state government agencies.

The data on BC market share presented above gives no information on the borrower's process of choosing a lender. When cooperatives are shopping around for a loan to finance an expansion, how many of them consider the BCs? How many alternative sources are considered? The survey conducted for this dissertation asked respondents to rank the sources of long-term credit that they would consider when seeking financing for a capacity expansion. This question reveals: 1) the number of cooperatives that would consider each source (i.e., the number of "valid cases" in Table 6.4), and 2) how highly those considering each choice would rank that choice relative to alternative sources.

There was some confusion regarding interpretation of the question, with some respondents simply checking the sources they would consider rather than ranking them. When the ranked and unranked data are combined, 154 out of 178 cooperatives, or 86.5 percent, reported that they would consider the BCs when seeking financing for an expansion. On the other hand, 24 cooperatives, or 13.5 percent of respondents, reported that they would not consider a BC. Both ranked and unranked responses to this question are considered below.

When the ranked data are examined, of the 121 respondents who would consider borrowing from the BCs, 81.8 percent ranked the BCs as their first choice, while 93.4 percent ranked it 1 or 2. This indicates that the BCs command serious consideration from farmer cooperatives and are very competitive with other financing sources. The next most important source was debt issued by cooperatives to members, ranked as their first or second choice by 62.3 percent of 53 respondents who would consider a debt issue. Commercial banks were also an important source, ranked 1 or 2 by 63.5 percent of 85 respondents. (See Table 6.4). Sources mentioned under the category "other" included

private placement of debt securities, contract purchases with the seller of the assets, financing from regional cooperatives, capital financing companies, and loans from state government agencies.

Thirty-eight cooperatives misinterpreted this question and failed to rank the sources they would consider, simply checking them instead. The unranked data also reveals that the BCs are the source most likely to be considered, with 86.8 percent of respondents reporting that they would consider the BCs as a potential source of financing.

Table 6.5

Desirability of Various Sources of Credit for Capacity Expansions (Unranked Data)

II.1 When seeking long-term credit to finance a capacity expansion, which of these sources would you be most likely to consider?

Source	Frequency	Percent [1]
Banks for Cooperatives	33	86.8
Bonds, notes & debt certificates issued to members	6	15.8
Commercial banks	25	65.8
Insurance companies	10	26.3
Capital lease obligations	20	52.6
Industrial development revenue bonds	19	50.0
Other:_____ [2]	3	7.9

[1] Percentages based on 38 valid cases.
[2] The category "other" includes: private placement of debt securities, contract purchases with the seller of the assets, as well as financing from regional cooperatives, capital financing companies, and state government agencies.

(See Table 6.5). Altogether, 86.8 percent of respondents reported that they would consider the BCs for long-term financing, more than any other source.

Cooperatives were also asked how much of their long-term financing was received from the BCs and other sources over the last five years. Respondents reported, on

Table 6.6

Sources of Long-term Debt Financing to Cooperatives

II.2. Over the past five years, approximately what percent of your firm's long-term debt financing was obtained from each of the following sources?

Source	Mean Percent [1]	Standard Deviation	Min	Max
Banks for Cooperatives	59.6	41.2	0	100
Bonds, notes or debt certificates issued to members	4.1	13.9	0	100
Commercial banks	14.9	31.6	0	100
Insurance companies	4.2	15.4	0	95
Capital lease obligations	4.6	13.0	0	100
Industrial development revenue bonds	2.6	8.7	0	53
Other:_____ [2]	4.6	19.1	0	100

[1] Percentages based on 162 valid cases.
[2] The category "other" included: contract purchases with the seller of the assets, government programs, and the National Cooperative Bank.

average, receiving 59.6 percent of their long-term debt from the BCs. The second most important source was commercial banks, which supplied, on average, 14.9 percent of long-term debt to the respondents. (See Table 6.6). The BCs supplied 100 percent of the long-term debt financing for a third of the respondents (33.3 percent). The BCs supplied 70 percent or more of the long-term debt needs for over half the respondents. About a fourth of the respondents reported that the BCs had provided no long-term financing over the last five years.

The survey showed that the BCs' market share was greatest among medium-sized cooperatives, and, surprisingly, lowest among smaller cooperatives. They provided 73.1 percent of the long-term debt financing used by cooperatives with annual sales between $31 and $50 million, 65.9 percent for firms with sales between $51 and $99 million, and

Table 6.7			
Percent of Long-Term Debt Financing Obtained From the Banks for Cooperatives, by Firm Size Category			
Annual sales	Mean	Standard Deviation	Number of firms
Less than $30 million	49.7	46.0	37
$31 to $50 million	73.1	38.3	29
$51 to $99 million	65.9	40.8	33
$100 million and over	56.7	38.1	62

56.7 percent for firms with sales over $100 million. In contrast, they provided only 49.7 percent of the long-term debt of respondents with annual sales less than $30 million. (See Table 6.7). However, the smaller cooperatives included in the survey population are at the high end of the zero to $30 million size range. BC market share might be higher among smaller cooperatives not represented in the survey population.

A breakdown of responses by commodity group revealed that the BCs' market share was greatest among grain and farm supply cooperatives (70 percent), followed by specialty cooperatives ("other") at 65 percent, cotton cooperatives at 64.3 percent, and sugar cooperatives at 56.3 percent. The BC share of long-term debt was lowest among dairy, rice and poultry/livestock cooperatives. (See Table 6.8).

The figures on BC market share by commodity group differ substantially from what was obtained by the Agricultural Cooperative Service from their census of the 100 largest cooperatives (see Table 6.1). The survey done here of the 290 largest cooperatives revealed a BC market share that was significantly higher for farm supply cooperatives, and significantly lower for fruit and vegetable, dairy, rice and poultry/livestock cooperatives.

Part of this discrepancy may be explained by the inclusion of a greater number of smaller firms in this survey population, as well as differences in the way that BC market

Table 6.8

Percent of Long-term Debt Financing Obtained from the Banks for Cooperatives, by Commodity Group

Commodity group	Mean	Standard Deviation	Number of firms
Fruits & vegetables	52.9	43.9	24
Farm supply	70.5	37.6	36
Dairy	40.1	42.2	32
Grain	70.0	38.9	21
Sugar	56.3	45.3	6
Rice	42.5	46.0	2
Cotton	64.3	47.6	7
Poultry/livestock	46.1	41.9	8
Other	65.0	44.8	7
Farm supply and grain	73.4	31.5	19

share is defined. The ACS survey obtained detailed financial information from the largest cooperatives. In the ACS data, debt held by the BCs and total debt were added together for the firms in each category, and then debt held by the BCs was divided by total debt to get a precise BC market share figure as of a certain date. In contrast, this survey simply asked respondents to report how much of their long-term debt came from the BCs over the last five years. The figures in Table 6.8 represent the mean values reported by the firms in each category.

The firms in the survey population were also asked whether, when financing a capacity expansion, they would consider a joint financing arrangement involving two or more lenders to be desirable. The majority of respondents (60.1 percent) felt that a joint-financing arrangement was not desirable, while 13.9 percent thought it was desirable and 26 percent were indifferent. (See Table 6.9). The responses were similar across firm size

Table 6.9

Opinions on the Desirability of Joint Financing Arrangements

II.3 When seeking long-term credit to finance an expansion of your firm's capacity, do you consider a joint-financing arrangement involving two or more lenders desirable?

Response	Frequency	Percent [1]
Yes	24	13.9
No	104	60.1
Indifferent	45	26.0

[1] Percentages based on 173 valid cases.

categories. Farm supply and grain cooperatives reported that they did not want joint financing arrangements more often than cooperatives in other commodity groups.

Those who favored joint-financing arrangements argued that they improve interest rates for the borrower, reduce the perceived exposure by each lender, and can sometimes increase the amount of credit available. One respondent commented that they get a better response and less power play when more than one lender is involved. Another cooperative reported using joint financing arrangements so they could keep business relationships with both a local bank and a BC. Two cooperatives in Hawaii reported using joint financing by a commercial bank and a state agency, because the state had a stake in their enterprise, which was on state land.

To summarize, the survey revealed that the BCs are one of the first sources that cooperatives turn to to satisfy their needs for long-term debt financing. They supply the majority of long-term debt for most of the respondents, far more than any other source. In addition, for about a third of the respondents, the BCs were the exclusive supplier of long-term credit. The majority of respondents did not want joint-financing arrangements

involving the BCs and other lenders, enhancing the ability of the BCs to influence the investment decisions of those who borrow from them.

The question that remains is whether they are able to use that dominant position to influence investment coordination in the industries they lend to. However, before that question is addressed, the factors which determine the share of the cooperative credit market held by the BCs will be examined. This is to identify the constraints the BCs face in coordinating investments and to better understand how competitive factors impact on their coordinating ability.

6.4. Factors Determining BC Market Share

The market share of the BCs depends on how competitive they are relative to the other sources of financing discussed above. Their competitiveness depends on the costs and benefits to cooperatives of taking collective action through membership in the BCs, and how the BCs deal with the interdependence of their members. In order to maintain their customer base, the BCs must provide attractive returns to members through loan pricing, patronage refunds, specialized lending expertise, financial advice, and intangible factors, such as loyalty and cooperative ideology.

Borrowers' perception of fairness is an important factor influencing the decision to seek financing from the BCs. To understand some of the operating constraints of the BCs and the extent to which they can influence their market share, it is useful to view the cooperative as a coalition (Staatz, 1984). Under this view of the cooperative, potential conflicts among the goals of management, members and directors determine the degree of cooperation that is achieved and the distribution of costs and benefits from cooperating.

The remainder of this section will describe the key factors which determine the BCs' market share.

6.4.1. Security Requirements

An aspect of loan pricing which may have an impact on BC market share is their practice of securing most loans with the borrower's underlying assets, including cash, accounts receivable, inventories, plant and equipment, etc. It is BC policy to require a security interest in almost everything. This practice may put large borrowers at a disadvantage when they try to get financing from other sources, although in recent years, some of the larger borrowers have been obtaining unsecured financing from the BCs. When the BC is involved as a secured lender, other investors may be reluctant to get involved unless they also have a secured position. One cooperative CFO (Dylla, 1987) has argued that secured financing for industrial companies is seen by the capital markets as a sign of weakness and commands a higher interest cost than unsecured loans.

The BCs' policy of doing for the most part only secured lending may have a dual impact on their share of the cooperative credit market. It may help their market share by preventing larger cooperatives from gaining access to alternative sources of financing, or it may encourage defection by large cooperatives in order to gain access to lower cost sources of financing, such as commercial paper.

In the survey, cooperatives were asked whether the BCs' security requirements are more stringent than those of other lenders. The majority of respondents (66.1 percent) felt they were about the same, while 29.1 percent considered BC security requirements more stringent than other lenders, and 4.8 percent thought they were less stringent. (See Table 6.10). These responses were similar across firm size categories and commodity

Table 6.10

Perceived Stringency of the Banks for Cooperatives' Security Requirements

II.4 How would you rate the BCs' security requirements relative to those of other lenders?

Response	Frequency	Percent [1]
More stringent	48	29.1
About the same	109	66.1
Less stringent	8	4.8

[1] Percentages based on 165 valid cases.

groups. However, the manager of a local farm supply cooperative commented that the BCs' requirements are stricter in some ways and looser in others. This respondent reported that BC covenant agreements are more involved and require more reports and paperwork, with the BC insisting on limitations and veto rights on other borrowing. However, the borrower also reported that the BC seems less concerned about appraisals and underlying net worth than other lenders.

The firms surveyed were asked to indicate the extent to which they agreed or disagreed with the statement, "The BCs' security requirements put my cooperative at a disadvantage when we seek financing from other sources because other investors are reluctant to get involved unless they have an equally secured position." Thirty-four percent of respondents were neutral regarding this statement, while 44 percent agreed or strongly agreed and only 21.7 percent disagreed or strongly disagreed. (See Table 6.11). This gives some indication that the BCs' security requirements are viewed as putting borrowers at a disadvantage with regard to other sources of credit.

Table 6.11

Perceived Disadvantage From the Banks for Cooperatives' Security Requirements

II.5 To what extent do you agree or disagree with the following statement: The BCs' security requirements put my cooperative at a disadvantage when we seek financing from other sources because other investors are reluctant to get involved unless they have an equally secured position.

Response	Frequency	Percent [1]
Strongly agree	22	13.3
Agree	51	30.7
Neutral	57	34.3
Disagree	26	15.7
Strongly disagree	10	6.0

[1] Percentages based on 166 valid cases.

Many more small firms were neutral on this question than larger firms, possibly reflecting their more limited access to alternative sources of financing. The responses of firms in various commodity groups were similar to the responses for the group as a whole.

However, this does not translate into a decision by cooperatives to leave the BCs. They were asked whether the BCs' security requirements are a significant deterrent to borrowing from them. The majority of respondents (53.1 percent) either disagreed or strongly disagreed that BC security requirements are a deterrent to doing business with them. Only 21.1 percent agreed or strongly agreed that they were a deterrent. (See Table 6.12).

A breakdown of responses to this question by firm size revealed that firms in the size categories of $31 to $50 million and $100 million and over in annual sales more often disagreed that BC security requirements were a deterrent to borrowing from them. There were no significant differences in responses across commodity groups.

Table 6.12		
Effect of Banks for Cooperatives' Security Requirements on Cooperatives' Borrowing Decisions		
II.6 To what extent do you agree or disagree with the following statement: The BCs' security requirements are a significant deterrent to borrowing from them.		
Response	Frequency	Percent [1]
Strongly agree	10	6.0
Agree	25	15.1
Neutral	43	25.9
Disagree	67	40.4
Strongly disagree	21	12.7
[1] Percentages based on 166 valid cases.		

6.4.2. Loan Pricing

Loan pricing by the BCs affects investment coordination in two ways. First, it has a direct effect on investment decisions by signalling to the borrower the bank's assessment of the riskiness of the proposed investment. Second, loan prices also affect coordination by influencing the BCs' share of the market for cooperative credit. The only aspect of loan pricing discussed here is with regard to its impact on market share.

The interest rates offered by the Banks for Cooperatives have traditionally been lower than those offered by investor-owned financial institutions of comparable size. In an unpublished appendix to their 1981 article "Cooperatives' Shares in Farm Industries: Organizational and Policy Factors," Caves and Petersen cite several studies of the comparative interest rate advantage provided by the BCs. Between 1960 and 1967, the average interest rate charged by the BCs was 5.03 percent. During the same period, commercial banks charged 6.84 percent. Between 1968 and 1975, the average BC rate was 7.47 percent, while the average commercial bank rate was 8.13 percent, suggesting a

margin of advantage of roughly 10 to 25 percent for BC loans. However, this comparison of interest rates was not adjusted for the effects of required stock purchases and patronage rebates associated with BC loans. This would increase the BCs' margin of advantage, as long as the banks returned a patronage dividend greater than the required capital contribution.

Much of the BCs' interest rate advantage in the past is attributable to the Farm Credit System's status as a government-sponsored enterprise, similar to Fannie Mae. The implicit government guarantee that the system would not be allowed to fail resulted in FCS having access to funds in the New York capital markets at a rate lower than otherwise would have been the case. This advantage was then passed on to borrowers in the form of lower loan prices.

However, the 1987 legislation that bailed the Farm Credit System out of its financial difficulties mandated that the system's institutions are not to charge any borrower an interest rate lower than "competitive market rates for similar loans made by private lenders." This law has been difficult to enforce because the effective interest rate on a BC loan may be quite different from the stated rate. The loan price offered to a BC customer is contingent upon a future patronage rebate. This contingent contract is consistent with the cooperative mode of operation, but it may put the BCs at a competitive disadvantage relative to other lenders with whom the net cost of money can be known in advance of the transaction.

Aside from the contingent nature of BC loan prices, their traditional method of allocating overhead and operating costs equally across all borrowers in the past hurt the BCs' competitive position. While consistent with cooperative ideals, average cost pricing became an issue which threatened to dissolve the coalition of a few large and many small

cooperatives which make up the BCs. In order to satisfy larger patrons who were threatening to defect, the BCs consolidated their operations to take advantage of scale economies and instituted differential pricing rules to reduce the extent to which the larger borrowers were subsidizing the smaller ones. This prevented the BCs from losing their share of the credit market consisting of large cooperatives.

The ownership linkages between cooperatives borrowing from the BCs may also be an important determinant of BC market share. The extent to which larger cooperatives are willing to cross-subsidize smaller ones may depend on the degree of cooperative vertical integration in the industry. For example, regional farm supply cooperatives depend on local cooperatives to sell their products at the retail level, so they may have some incentive to tolerate cross-subsidization. However, one CoBank official remarked that borrowers' tolerance of cross-subsidization has declined markedly in recent years.

The BC loan price will be broken down into its component parts (the cost of funds, operating expenses, the credit risk premium, and net savings). These will be analyzed to get a better understanding of the specific ways in which pricing policies determine the distribution of benefits and costs and the incentives for cooperatives to borrow from the BCs. However, the pricing of BC loans often does not explicitly consider all of these cost components, but is rather done on the basis of current cost of funds in the capital markets and the pricing of competing lenders. For the survey of cooperatives, questions were identified regarding factors which were thought to influence borrowers decisions to do business with a BC, particularly fairness issues related to cost allocation and other bank policies.

The discussion of BC practices draws heavily on a study entitled, "An Analysis of Cost Allocation and Loan Pricing in the Banks for Cooperatives," by William H. Erickson

(1989). Erickson's research focused on BC practices prior to their consolidation in January of 1989. Where possible, this information has been updated to reflect the current practices of the three remaining BCs: the National Bank for Cooperatives (CoBank), the St. Paul BC, and the Springfield BC.

This analysis considers loan prices to be a form of contingent contract, with the final price adjusted by the expected value of the patronage rebate and revolved equity. As a guide to the components of the loan price, Table 6.13 presents an example created by CoBank showing how to calculate the effective interest rate on a BC loan.

6.4.2.1. Cost of Funds Allocation

The BCs' cost of acquiring funds is by far the largest component of the loan price that is quoted to a potential borrower. The cost of funds is the most volatile of the four components of the loan price, but it also has the most market information and tools for reducing risk. When a BC acquires funds, its choices about how to allocate the cost of these funds among its borrowers has a major impact on loan prices, and thus market share. The main issue is whether the cost of funds should be directly linked to loan prices via funding pools, or whether pricing and funding decisions should be separated, as they are in investor-owned banks.

The primary source of funds for the BCs is the sale of Farm Credit System consolidated system-wide bonds and discount notes. Other sources include commercial bank lines of credit and other private lenders, but they are very minor in comparison to the sale of system-wide securities. Each BC orders the FCS fiscal agency to sell notes and bonds to meet their funding needs. The agency then aggregates requests from all institutions in the system and issues securities to meet the needs of all FCS institutions.

Table 6.13

Effect of Investments and Patronage on the Cost of Borrowing

The following is a simple hypothetical example of a net effective interest rate calculation for a term loan from CoBank compared to a loan from a commercial bank. The CoBank loan is assumed to be made under terms of the loan-based capital plan, with a five-year stock revolvement. The commercial bank loan is made with no fees or compensating balance. Both loans are for $1 million at 9.50 percent interest.

	CoBank	Commercial Bank
Interest cost	$95,000	$95,000
Equity purchase	10,000	---
Cash patronage	(2,850)	---
Net Cash Flow	$102,150	$95,000
Less present value of retirement of:[1]		
Equity purchase	6,352	---
Equity patronage	4,224	---
Net Cost	$91,574	$95,000
Net effective interest rate[2]	9.16%	9.50%

[1] Present value calculated using a 9.50 percent discount factor.
[2] The effective interest rate on the CoBank loan, when patronage and the present value of future retirements are netted against interest cost and the cost of purchasing stock, is lower than the commercial bank loan by 34 basis points, or .34 percent.

Source: CoBank, borrower handout on the Loan-Based Capital Plan, January, 1992, p. 5.

FCS securities are considered to be agency issues of the U.S. government. The Farm Credit System's status as a government-sponsored enterprise results in special regulatory treatment and interest rates that are slightly higher than rates on U.S. Treasury securities. The spread between FCS and Treasury securities has fluctuated from a low of about five basis points to a high of around 100 basis points when the depressed agricultural economy caused financial difficulties for FCS in the mid-1980s.

A common practice for commercial banks is to manage the term structure of assets and liabilities to reduce the bank's exposure to interest rate fluctuations. This is accomplished by comparing the frequency with which assets and liabilities come back to the bank for repricing, and trying to match their terms. For example, if very long-term assets were funded with short-term liabilities, the bank would be exposed to interest rate risk. If interest rates rose and the bank had to issue short-term liabilities at higher rates, it would adversely affect the profitability of the bank. In an investor-owned bank, asset-liability management is performed for the organization as a whole, without being directly linked to loan pricing policy. In a cooperatively owned bank, however, members may choose to pool costs and revenues to some extent. The costs that are charged to the pool and the profits that accrue to it are divided among the members in proportion to their patronage of the firm. For this reason, BC borrowers may have a much greater concern with the linkage between the funding and pricing of loans, because it is through loan pricing that the funding costs are allocated among borrowers. The separation of funding and pricing decisions facilitates organization-wide asset-liability management (ALM). ALM impacts on the profitability of the bank as a whole, as well as on the funding costs and prices for individual loans. ALM alters the interdependence among borrowers.

The most common way of measuring the sensitivity of a bank's earnings to changes in interest rates is to use gap analysis. This compares the rates at which assets and liabilities reprice. For example, a positive gap within the range of maturities up to one year means that more assets are repricing than liabilities in that period. If interest rates fall during the period, the bank would experience a decline in earnings, because the

money from the loans that have been repaid would be loaned out again at a lower interest rate.[1]

An organization's ideal gap position depends on its goals. If its goal is to eliminate its exposure to interest rate risk, it will choose a gap position as close to zero as possible. However, the bank may choose to distribute its repricing assets and liabilities so as to take advantage of anticipated movements in interest rates. It is important to note that the interest rate sensitivity of members depends on their own debt structure, and may be significantly different from that of the bank as a whole. If the BC pursues organization-wide ALM, it may enhance its profitability and thus returns to members, but in doing so it changes the nature of borrower interdependence. ALM in a bank like the BCs with legal limitations on the scope of its assets is accomplished more through funding rather than lending decisions, i.e. by managing liabilities rather than assets. Funding decisions are different from pricing decisions, but both have an impact on the effective interest rate that borrowers pay.

In order to understand how funding and cost allocation decisions affect the cost of borrowing money from a BC, it is necessary to examine average cost and marginal cost loan pricing options. Average cost pricing is pricing to cover costs of funds that have been pooled and divided among the members of the pool. Marginal cost pricing, on the other hand, relates the current cost of funding a loan to the loan's price.

Average cost pricing with explicit pools for fixed and variable rate loans has been used in the past by the BCs, but more recently, as capital markets have grown more competitive and BC borrowers more heterogeneous, there has been a movement toward

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[1] For a more detailed discussion of ALM and gap management, see Barrett F. Binder, "Asset/Liability Management--Part 2: Management and Control of Rate Sensitivity," Magazine of Bank Administration, December, 1980.

marginal cost pricing of loans. The question of average vs. marginal cost pricing did not become a big issue until the Farm Credit Act of 1955, which gave BC boards of directors the authority to set their own interest rates, subject to the approval of the FCA. Prior to this time, loan prices were largely undifferentiated, and set by the governor of the FCA. The 1955 legislation also provided for the distribution of net savings to members in the form of patronage dividends. Prior to this legislation, the only dividends paid out were as a percentage of stock owned by the member, rather than patronage. The BCs began to function more like credit cooperatives than centrally administered development banks, and cost allocation practices became more subject to the need for group choice within each BC.

Average cost pricing offered the advantages of accounting simplicity, delegation of funding decisions to BC management, and increased stability of interest rates. Moreover, it was consistent with the cooperative ideal of equal treatment. However, average cost pricing rules also brought some disadvantages. The final effective cost of borrowing from the BC was not known since the debt pool was constantly being turned over. This complicated gap planning. Moreover, interest rates based on the average cost of BC debt instruments tended to lag behind changes in current market interest rates. This created the incentive for members to enter the BC pool in rising interest rate environments and exit when rates were falling. Significant levels of entry and exit diluted the pool's stabilizing effect for the remaining members. For this reason, limits on entry and exit (such as prepayment penalties or closing fees) were important in maintaining a stable coalition of borrowers under an average cost pricing scheme.

While funding pools were used for variable rate loans, in the past virtually all fixed rate loans were made with the term and price of the loan directly tied to the funding

instrument. The problem the BCs found was that only very large transactions could be efficiently match-funded. These transactions were priced based on the marginal cost of funds, with earnings on the loans ultimately distributed to all members based on their level of patronage.

In the late 1980s, there was a movement in the BCs away from the use of explicit pools and matched funding towards a broader approach to funding based on organization-wide ALM goals. The BCs have followed the trend of the banking industry in the explicit use of ALM. Increased volatility of interest rates made organization-wide ALM a widely accepted management practice in banking.

The previous BC practices of tying the price of each loan to a specific debt instrument is at the opposite end of the spectrum from an organization-based ALM approach. Under the latter, pricing and funding decisions are nearly separated. Pricing is based on the current cost of funds in capital markets, and funding decisions are made based on what transactions are needed to maintain a specific gap position for the organization as a whole. Erickson found in 1989 that only one of the then twelve district BCs based variable rate prices on average pool costs. The rest of them priced loans based on the prime rate or some combination of prime and pool costs. There has also been a movement away from variable rate loans. The vast majority of the BC loan portfolio is on a fixed rate basis with some type of marginal pricing based on both the current cost of funds as well as the pricing of competitors.

The severance of the direct link between loan pricing and the underlying cost of funds implies that the BCs are operating in a manner similar to investor-owned banks. Borrowers are less explicitly interdependent with regard to loan pricing, and the resulting

changes in BC profitability are only felt by members through the allocation of net savings in the form of cash and non-cash patronage rebates.

From the point of view of the borrowers, the main issue now is not whether the BCs should marginally price loans based on current capital costs, since this practice protects the bank from interest rate risk and is widely accepted by borrowers, but rather whether fixed-rate loans are available to borrowers of all sizes. In order to assess whether borrowers have access to all types of loan products they desire, cooperatives were first asked what type of loan they would prefer to receive from a BC. This was followed up with a question asking cooperatives what type of loan they would be most likely to obtain from a BC. A high degree of mismatch between what borrowers prefer and what they are likely to get may be a reason why the BCs might lose customers.

For financing a capacity expansion, the majority of respondents (78.9 percent) preferred to receive a fixed rate term loan from a BC, rather than a variable rate term

Table 6.14

Preferred Type of Loan for Financing Capacity Expansions

II.7 In order to finance an expansion of your firm's capacity, which type of loan would your firm prefer to receive from a BC?

Response	Frequency	Percent [1]
A fixed rate term loan	127	78.9
A variable rate term loan	34	21.1

[1] Percentages based on 161 valid cases.

loan. (See Table 6.14). Preferences for fixed rate financing were similar across firm size categories and commodity groups. The preference for fixed rate loans is particularly strong in the current low interest-rate environment, as generally firms will want a fixed-

rate loan if interest rates are low and likely to rise and a variable rate loan if rates are high and likely to fall.

However, the percentage of firms reporting that they were likely to obtain a fixed term loan from the BCs was considerably lower (62.6 percent). (See Table 6.15). Of the repondents who preferred a fixed rate term loan, 22 percent said they would be most likely to obtain a variable rate term loan. The percentage of firms in each size category who reported they would obtain fixed rate financing from a BC was fairly consistent across size categories. Poultry, livestock and farm supply cooperatives most often reported wanting fixed rate financing but being more likely to obtain a variable rate loan.

For the most part, cooperatives did not find the unavailability of fixed rate term loans to be a significant deterrent to borrowing from a BC. More respondents (46.2 percent) disagreed than agreed (27.5 percent) that lack of access to fixed rate financing deterred them from borrowing from a BC. (See Table 6.16). More small cooperatives than large ones reported that the unavailability of fixed rate term loans is a significant deterrent to borrowing from a BC. There were no significant differences in responses

Table 6.15

Type of Loan Typically Obtained for Financing Capacity Expansions

II.8 For financing a capacity expansion, which type of loan would your cooperative be most likely to obtain from a BC?

Response	Frequency	Percent [1]
A fixed rate term loan	102	62.6
A variable rate term loan	61	37.4

[1] Percentages based on 163 valid cases.

Table 6.16		
Effect of Availability of Fixed Rate Financing on Decision to Borrow from a Bank for Cooperatives		
II.9 To what extent do you agree or disagree with the following statement: The unavailability of fixed rate term loans is a significant deterrent to borrowing from a BC.		
Response	Frequency	Percent [1]
Strongly agree	12	7.0
Agree	35	20.5
Neutral	45	26.3
Disagree	58	33.9
Strongly disagree	21	12.3
[1] Percentages based on 171 valid cases.		

across commodity groups. Out of the 24 respondents who do not currently have a relationship with a BC, eleven, or 45.8 percent, agreed or strongly agreed that the unavailability of fixed rate loans was a deterrent to borrowing from a BC, suggesting that this may be an important reason why they chose to obtain financing elsewhere.

6.4.2.2. Operating Expense Allocation

Operating expenses are the second largest expense category in banking. These costs arise from the making and servicing of loans and related tasks. In 1987, the operating costs of the entire BC system were only 7.8 percent of total costs, but their impact on the banks' competitive position relative to other lenders is much greater than their percentage of total costs would indicate (Special Committee on BC Structure, 1988). Whenever banks are concerned about increasing their profits by cutting costs, operating

expenses are the focus of attention. The rules that the BCs use to allocate these costs among borrowers determine the size of the second component of the loan price.

Empirical studies have shown that the operating expenses of the BCs and banks in general exhibit significant economies of scale. Economies of scale in banking arise from the fact that some inputs are lumpy in acquisition. Once acquired, fixed assets such as accounting systems or computer software for highly specialized applications can be spread over a large volume of borrowers and transactions, with little cost incurred for an additional borrower or transaction. There may also be economies in the purchase of larger sizes of certain inputs, such as equipment and buildings. Moreover, a higher volume of output may allow a greater degree of specialization in production activities.

A wide variation in the operating costs of the 12 district BCs was observed prior to their consolidation. Operating expenses per $100 of loan volume ranged from a low of about $0.60 for the St. Paul BC to a high of about $1.35 for the Texas BC. A study of the potential gains from consolidating the BCs (Hopkins, et al., 1987) found that economies of scale exist within the BCs. Their subsequent consolidation was an effort to reduce the cost of borrowing from the BCs, thereby preventing the defection of some of the larger cooperatives with greater access to alternative sources of financing. The proxy statement for the BC consolidation anticipated a 20 percent decrease in operating costs due to the economies of scale associated with a 13 bank merger. Cost savings were expected to be derived from the centralization of accounting systems and other functions, as well as a reduction in duplicative services. Because only 11 of the BCs elected to merge, the operating cost savings that were actually realized were somewhat lower.

The existence of scale economies (a major impetus for forming a cooperative in the first place) gives rise to a difficult cost allocation question. Reductions in unit costs

are the result of spreading overhead costs, the largest component of operating costs, over a larger volume of business. These costs cannot be traced to a specific unit of output for cost allocation purposes. Nearly all operating costs are joint costs affecting all members, so the allocation of these costs requires use of an arbitrary rule.

BCs allocate operating costs in the form of an addition to the spread portion of the loan price. However, at the time they are pricing the loan, they do not know what the actual operating expenses will be. Therefore, they have to estimate what these costs are likely to be and price to cover them, with any excess or insufficient charges adjusted by the final patronage refund. Allocation of operating costs may be made even more difficult by the banks' accounting system, which was not designed to allow for tracking of all direct costs and the billing of borrowers at different interest rates to reflect these costs.

In 1989, Erickson found that while the BCs have an ongoing concern about minimizing costs, little effort has been made to differentiate loan prices based on the costs of making and servicing particular types of loans. The St. Paul and Wichita districts indicated that they were looking at allocating operating costs differently between large borrowers that were served by a specialized staff, and a larger number of smaller cooperatives.

At the time of Erickson's survey, however, all district BCs reported allocating operating expenses in proportion to the borrower's share of total loan volume. The Central Bank for Cooperatives allocated operating costs back to the districts originating the loans for CBC participation, a practice continued by CoBank after the BC consolidation. Most of the BC officials interviewed by Erickson indicated that market rates dictated the size of the spread that could be achieved on a given loan, rather than operating expenses dictating the price in a "cost-plus" fashion.

Market conditions allow larger spreads in markets where operating expenses are higher. Spreads and operating costs both tend to be lower for large borrowers. Operating costs are tracked internally by the BCs only to help them understand and control their costs and monitor how fairly members were being treated, but are not used for pricing purposes. Sometimes extra fees are charged by the BCs to recover additional costs involved in certain transactions, or to make a loan package comparable to alternatives being considered, but for the most part, fees are not used as a way of differentiating among borrowers with regard to operating expenses.

Erickson's research disclosed that there was reasonably wide acceptance of the differentiation on pricing between large and small borrowers. Small borrowers recognized that the cost of servicing their loans was probably higher than the cost of servicing loans to the larger borrowers, and accepted the fact that an additional margin was necessary to cover these costs. Large borrowers demanded the lower rates that are available to them through financing alternatives, although they understood that they needed to assume their share of the BCs' overhead costs along with other borrowers. The difference in operating expenses arising from the costs of servicing loans to large and small borrowers has been used to justify the different interest rates that result from competitive market forces. A certain differential is considered acceptable, but if competitive market rates force a widening of the differential to too great a degree, small borrowers might complain of unfair treatment by the BCs. However, since alternative sources of financing to smaller cooperatives are limited, the BCs are not likely to experience a loss in market share. If the loan pricing rules were changed to limit the size of the interest rate differential between large and small borrowers, the large borrowers would be the ones to defect.

Because borrowers' perceptions of fairness in the allocation of operating expenses might affect their decision to borrow from a BC, cooperatives were asked whether they felt the BCs should differentiate among borrowers in allocating these costs. Seventy percent of cooperatives responding to the survey agreed or strongly agreed that loan prices from the BCs should clearly differentiate among borrowers based on size and servicing costs. Only 11.5 percent disagreed that such differentiation was desirable, with

Table 6.17

Desirability of Loan Price Differentiation Based on Borrower Size and Servicing Costs

II.10 To what extent do you agree or disagree with the following statement: Loan prices from the BCs should clearly differentiate between borrowers based on size and servicing costs.

Response	Frequency	Percent [1]
Strongly agree	46	26.6
Agree	75	43.4
Neutral	32	18.5
Disagree	16	9.2
Strongly disagree	4	2.3

[1] Percentages based on 173 valid cases.

18.5 percent remaining neutral. (See Table 6.17). Larger borrowers more often reported favoring loan price differentiation based on borrower size and servicing costs. There were no significant differences in responses across commodity groups.

Because most banks differentiate among borrowers based on size, either of the borrower or the transaction, the size of the borrower relative to the bank's other customers becomes an issue. The cooperatives in the survey were asked whether they had been offered lower prices from other lenders that considered them to be a larger borrower. Almost half the respondents (47.1 percent) reported that they had. (See Table

Table 6.18		
Importance of Borrower's Size Relative to Size of Lenders' Portfolio		
II.11 Has your cooperative been offered lower loan prices from other lenders that consider your firm to be a larger borrower?		
Response	Frequency	Percent [1]
Yes	80	47.1
No	90	52.9
[1] Percentages based on 170 valid cases.		

6.18). Large cooperatives reported more often than small ones that they had been offered lower prices by lenders that consider them to be a larger borrower. This was also true of sugar and grain cooperatives more than those in other commodity groups.

While the majority of borrowers favored differentiation by size or servicing costs, a different question is whether they would stop borrowing from a BC if the BC had a policy

Table 6.19		
Effect of Loan Price Differentation Based on Borrower Size on Decision to Borrow from the Banks for Cooperatives		
II.12 To what extent do you agree or disagree with the following statement: A BC policy that did not differentiate interest rates based on borrower size (or size of loans) would be a major deterrent to borrowing from them.		
Response	Frequency	Percent [1]
Strongly agree	32	18.6
Agree	65	37.8
Neutral	44	25.6
Disagree	30	17.4
Strongly disagree	1	0.6
[1] Percentages based on 172 valid cases.		

of not differentiating interest rates based on borrower or transaction size. Just over half (56.4 percent) agreed or strongly agreed that a policy of not differentiating would be a major deterrent to borrowing from the BCs, while only 18 percent of respondents disagreed or strongly disagreed. (See Table 6.19). This indicates a fairly strong mandate from cooperatives to BC management to differentiate among borrowers in the allocation of operating expenses. Larger cooperatives reported more often than smaller cooperatives that a lack of differentiation in the allocation of operating expenses would be a major deterrent to borrowing from the BCs. There were no significant differences in responses to this question across commodity groups.

The cooperatives in the survey population were also asked whether they preferred for the BCs to use variable up-front fees for differentiating among borrowers or to include them in the interest rate, thus making them somewhat less directly stated. Variable up-

Table 6.20

Desirability of Loan Price Differentiation through Variable Up-Front Fees

II.13 To what extent do you agree or disagree with the following statement: It is better to use variable up-front fees to differentiate between borrowers on the basis of size or servicing costs than to include them in the interest rate.

Response	Frequency	Percent [1]
Strongly agree	5	2.9
Agree	45	26.0
Neutral	72	41.6
Disagree	45	26.0
Strongly disagree	6	3.5

[1] Percentages based on 173 valid cases.

front fees were preferred by 28.9 percent of respondents, and simply including a component in the interest rate to account for operating expenses was preferred by 29.5 percent. A large proportion of respondents (41.6 percent) were neutral on this issue, reflecting their perception that the servicing costs of the loan would be calculated into the effective interest rate either way. (See Table 6.20). The main difference is in the degree of transparency to the borrower. A lack of transparency may increase borrowers' perceptions of unfairness in the allocation of operating expenses. However, this did not seem to be a large concern for the survey respondents. There were no major differences in responses across size categories or commodity groups.

6.4.2.3. Allocation of Credit Risk Costs

Some BC costs arise from the credit risk that is inherent in lending money. The loan price must cover these costs. The most obvious cost is for actual loan losses that the BCs experience. Other costs associated with credit risk are additional time spent by BC officials monitoring problem loans and providing financial counseling. Liquidation of loans also takes a considerable amount of staff time. Most banks set up an accounting reserve to cover anticipated loan losses. Except for the period of the farm debt crisis, in which cooperatives experienced a large increase in uncollectible bills, the credit quality of the BC loan portfolio has been very high.

In addition to using a loan loss reserve to protect itself against default risk, a bank must maintain a level of equity that is commensurate with the level of risk it incurs. Equity investors require a higher rate of return than debtholders because the potential consequences of default are higher for them. The difference between the yield on a default-free security and investment in a BC is the risk premium. Economic theory

suggests that in a market with many risk-neutral investors evaluating the difference between expected default losses and the risk premium, the market risk premium would equal the expected default loss. Credit rating agencies assist investors in estimating potential default losses by assigning a credit rating to corporate debt securities. The BCs must allocate among their borrowers the cost of increasing the share of their financing that is provided by higher cost equity capital.

Regulatory changes resulting from the 1987 farm credit legislation involve a new asset classification system and new capital adequacy regulations. The Farm Credit Administration adopted the Uniform Classification System (UCS) that is used by the agencies regulating commercial banks. While the old system focused more on the borrower's overall financial health, the new system focuses on assessing the asset value of the loan. The UCS system tends to classify credit at a higher quality than the old system did. It also does a better job of identifying the potential for loan losses than the old system. However, for pricing purposes, UCS does not provide enough differentiation among borrowers, most of whose loans fall into the "acceptable" category.

Given the inadequacy of UCS for differentiating among borrowers based on credit risk, the BCs sometimes use information from the Loan Pricing Corporation, a firm that provides competitive pricing information on commercial loans. Erickson found that the 12 district BCs could be divided into three categories with respect to their approach to pricing for credit risk. Two BCs made no spread differentiation for credit risk, six used the same classification system as UCS, and four used a more restrictive classification system than UCS.

However, for pricing purposes, classification of loans into different categories must be translated into a differential spread that reflects credit risk. Most of the BCs have

done this on an ad hoc basis or by monitoring the spreads of competing lenders. Another common practice is to simply apply an arbitrary spread differential, such as 50 basis points, to price for credit risk. These practices have probably changed very little since the BC consolidation, because the former district banks were granted considerable autonomy in their credit operations. The St. Paul district, however, used a formula to determine the credit risk spread based on varying levels of equity financing the loan. The riskier assets would be funded with a greater percentage of higher cost equity financing, resulting in larger spreads for these loans. St. Paul's approach explicitly prices loans for credit risk on a marginal rather than an average cost basis. For the most part, allocation of credit risk costs is handled similar to the allocation of overhead expenses. Because risk premiums cannot be assessed on riskier loans at a high enough level to cover loan loss reserve requirements, there is a certain amount of cross-subsidization of riskier members by more financially sound members.

Erickson found that the main force driving the risk pricing practices of the BCs was the pricing practices of market competitors. The degree to which competitive forces allowed for credit risk differentiation varied across districts. In some districts, competitive forces, especially on the best and largest loans, made it impossible to average default risk costs across all members equally. For the larger borrowers, credit risk differentiation is a major issue that has been addressed by closer competitive monitoring and individually negotiated pricing. For smaller loans, the allocation of credit risk costs drives pricing in a market where the BCs are more of a price leader. In these markets, the BCs have pursued a more equal sharing of costs among borrowers regardless of their credit quality. In order to maintain a higher market share, especially of the larger borrowers, the BCs

may be forced to discriminate more in the allocation of default costs between large and small borrowers.

Unless loan prices differentiate borrowers with respect to the risk they impose on the bank, there is cross-subsidization of the riskier borrowers by the less risky ones. Cooperatives were asked in the survey whether they think the BCs should charge varying rates based on the riskiness of the loan. The vast majority of respondents (86.8 percent) either agreed or strongly agreed that pricing loans to differentiate borrowers on the basis of credit risk was desirable. Only 7.4 percent disagreed or strongly disagreed with the

Table 6.21

Desirability of Loan Price Differentiation Based on Risk

II.14 To what extent do you agree or disagree with the following statement: The BCs should charge varying rates on loans based on the riskiness of the loan.

Response	Frequency	Percent [1]
Strongly agree	55	31.4
Agree	97	55.4
Neutral	10	5.7
Disagree	11	6.3
Strongly disagree	2	1.1

[1] Percentages based on 175 valid cases.

BCs' pricing for credit risk. (See Table 6.21). This is an area where the BCs are expected to behave in a manner similar to other lenders, even though they are cooperatively owned banks. There were no major differences in responses across size categories or commodity groups.

Cooperatives were also asked to indicate what they feel is the most appropriate measure of risk for a BC to use when evaluating and pricing a loan. The majority of

Table 6.22

Desirability of Various Methods of Measuring Credit Risk

II.15 What do you think is the most appropriate measure of risk for a BC to use when evaluating and pricing a loan?

Response	Frequency	Percent [1]
A formula based on the borrower's current financial performance	21	12.0
A rating based on the industry the investment would be in	0	0.0
A formula based on both the borrower's financial performance and characteristics of the investment	109	62.3
Analysis of individual borrowers at the bank's discretion	39	22.3
Other:_____ [2]	6	3.4

[1] Percentages based on 175 valid cases.
[2] The category "other" includes: projected cash flows only, a formula based on long-term financial performance, and a combination of "all of the above."

respondents (62.3 percent) favored using a formula based on the borrower's financial performance as well as characteristics of the investment. Analysis of individual borrowers at the bank's discretion was favored by 22.3 percent of borrowers, while 12 percent preferred using a formula based only on the borrower's current financial performance. A few respondents (3.4 percent) advocated other risk measures, including projected cash flows only, a formula based on the borrower's long-term financial performance, or a combination of all of the above. No respondents favored the use of industry-based risk ratings. (See Table 6.22). Borrowers in all size categories and commodity groups agreed that a formula based on both the borrower's financial performance and characteristics of the investment is the most desirable way for the BCs to price for credit risk.

The most interesting aspect of the responses to this question was that the majority of borrowers preferred using a formula to assess risk characteristics and price loans. In a cooperative with a membership as heterogeneous as that of the BCs, the use of pre-determined formulas may be a way of avoiding the appearance of conflicts of interest among borrower/members. However, a sizable portion of respondents called for analysis of risk to be left to the discretion of the bank.

In order to determine whether borrowers' feelings on the issue of allocation of credit risk costs would translate into the action of seeking financing from a source other than a BC, cooperatives were asked whether a BC policy of not differentiating loan prices on the basis of credit risk would be a major deterrent to doing business with them. Over half of the respondents (54.6 percent) either agreed or strongly agreed that such a policy would deter them from borrowing from a BC. Only 16 percent disagreed or strongly

Table 6.23

Effect of Loan Price Differentiation Based on Risk on Decision to Borrow From a Bank for Cooperatives

II.16 To what extent do you agree or disagree with the following statement: If the BCs did not differentiate loan prices based on the risk characteristics of the loan, it would be a major deterrent to doing business with them.

Response	Frequency	Percent [1]
Strongly agree	30	17.2
Agree	65	37.4
Neutral	51	29.3
Disagree	26	14.9
Strongly disagree	2	1.1

[1] Percentages based on 174 valid cases.

disagreed that differentiation among borrowers with respect to the costs of credit risk is not an issue for them, while 29.3 percent of respondents were neutral on the issue. (See Table 6.23). There were no major differences in responses across size categories. A breakdown of responses by commodity group revealed that fruit and vegetable cooperatives most often agreed and sugar cooperatives least often agreed that they would be deterred from borrowing from the BCs if they did not differentiate among customers based on credit risk.

To summarize, most of the respondents favor differentiation among borrowers based on credit risk, but prefer that it be done using a formula, rather than at the bank's discretion. Moreover, the majority of respondents feel that loan price differentiation on the basis of credit risk is an important enough issue that if it were not done, they would be deterred from seeking financing from a BC.

6.4.2.4. Allocation of Net Savings

After the cost of funds, operating expenses and the credit risk costs have been covered, the remaining portion of the price goes to profit, called net savings in the context of the cooperative firm. The main question for the cooperative to resolve is whether members should receive net savings in the form of lower loan prices or higher patronage rebates. The effective interest rate on a loan from a BC is contingent on the amount of the patronage refund. However, there is some question as to whether the member evaluates a loan prospect based on the initial quoted price or the final adjusted price.

Erickson suggests that the framing of the loan decision may have some impact on how the member views the costs and benefits of borrowing from a BC. When the BC's price is greater than that of a competitor, the member may see this price difference as a

loss incurred from doing business with a BC. The present value of the patronage refund is seen as a gain. Erickson speculates that the member may weight the loss based on a price difference more heavily than the gain from a patronage refund. Another possibility is that the member may often simply compare the price of competing alternatives to the BC's unadjusted price.

Another factor that may affect BC market share is the manner in which net savings are allocated among borrowers. The use of a single pool results in averaging the net savings equally across all borrowers in proportion to their patronage. However, when BC rates of return vary significantly across different groups of borrowers, single pools do not result in a fair and equitable distribution of earnings.

Erickson found that shortly before the consolidation of the BCs, ten of the twelve districts used single pools for earnings distribution. The Columbia BC used multiple pools based on several product classes, but found the pools to be quite small and difficult to manage. Some of the pools showed losses, and as a result paid no patronage refunds. Losses in these pools had to be offset by profits from the other pools. This form of pooling may make the cross-subsidization among members too transparent to maintain the coalition. The Columbia BC dropped the multiple pooling practice when they joined the National Bank for Cooperatives in 1989. Prior to 1988, the Louisville BC used nine patronage pools based on loan products. When they implemented a differential pricing program in 1988, they returned to the use of a single pool. Multiple pools were deemed to be unnecessary with differential pricing. This suggests that pricing and allocation of savings are substitute mechanisms for achieving an equitable allocation of the costs and benefits of borrowing from the BCs.

When considering the effects of net savings allocation on market share, it is clear that the issues of pricing, cost allocation and earnings allocation are intricately linked. It is difficult to consider their separate impacts on BC market share, because it is the combination of cash flows resulting from all three that enters into the borrower's decision. To a certain extent, differentiation among borrowers in one area, pricing, for example, substitutes for differentiation in another area, such as earnings allocation.

Table 6.24

The Desirability of Multiple Earnings Pools

II.17 To what extent do you agree or disagree with the following statement: In order to equitably distribute earnings, the BCs should use multiple pools reflecting the varying rates of return earned by the bank on loans to different groups of borrowers.

Response	Frequency	Percent [1]
Strongly agree	10	5.7
Agree	57	32.6
Neutral	53	30.3
Disagree	45	25.7
Strongly disagree	10	5.7

[1] Percentages based on 175 valid cases.

The final effective price of a BC loan depends on how the banks allocate earnings in the form of a patronage refund. The allocation method that is chosen has an impact on the effective loan price. Cooperatives were asked whether they thought the BCs should use multiple pools to distribute earnings more equitably based on varying rates of return earned by the bank on loans to different groups of borrowers. Responses to this question were mixed. Slightly more respondents agreed (38.3 percent) than disagreed (31.4 percent) that the BCs should use multiple pools to distribute earnings, with 30.3 percent

remaining neutral. (See Table 6.24). There were no significant differences in responses to this question across size categories or commodity groups.

This was followed up with a question assessing whether allocation of earnings via a single pool would be viewed by cooperatives as a significant deterrent to borrowing from the BCs. More respondents disagreed or strongly disagreed (46 percent) that the use of a single patronage pool would be a deterrent to doing business with them. Only 15.5 percent indicated that they would view use of a single pool as a significant deterrent, while

Table 6.25

Effect of Earnings Allocation by a Single Pool on the Decision to Borrow from a Bank for Cooperatives

II.18 To what extent do you agree or disagree with the following statement: The use by BCs of a single pool for allocating earnings among borrowers would be a significant deterrent to borrowing from them.

Response	Frequency	Percent [1]
Strongly agree	3	1.7
Agree	24	13.8
Neutral	67	38.5
Disagree	73	42.0
Strongly disagree	7	4.0

[1] Percentages based on 174 valid cases.

38.5 percent remained neutral. (See Table 6.25). A breakdown of responses showed that smaller firms more often disagreed that the use of single pools would deter them from borrowing from the BCs. There were no significant differences in responses across commodity groups.

Apparently how the earnings pie is divided up is not as much of a concern as is the size and stability of the pie. Several respondents commented that they definitely want to see a return on their investment in a BC, but that they want the return to be

predictable so that it can be included with reasonable accuracy when calculating the effective interest rate at the time of taking out a loan from a BC.

Table 6.26

Desirability of Industry-Based Pooling

II.19 One suggestion for improving the ability of the BCs to gather and use industry capacity information in their credit decisions is for them to implement industry-based pools. Under this proposed pooling scheme, borrowers would receive loan prices and patronage refunds reflecting the costs and returns to the BCs of making loans to their particular industry.

To what extent would you be in favor of the BCs adopting industry- based pools?

Response	Frequency	Percent [1]
Strongly in favor	10	5.7
Moderately in favor	47	27.0
Neutral	53	30.5
Moderately opposed	47	27.0
Strongly opposed	17	9.8

[1] Percentages based on 174 valid cases.

The cooperatives in the survey population were also asked their opinions on industry-based patronage pools. Under this proposed pooling scheme, discussed in greater detail in Chapter 8, borrowers would receive loan prices and patronage refunds reflecting the costs and returns to the BCs of making loans to their particular industry. The goal of industry-based pooling would be to improve the ability of the BCs to gather and use industry capacity information in their credit decisions. There was no strong agreement among survey respondents regarding whether the BCs should adopt industry-based pools. Slightly more were opposed to the idea (36.8 percent) than were in favor (32.7 percent), with 30.5 percent remaining neutral. (See Table 6.26). There were no major differences in response patterns across size categories. A breakdown of responses by commodity

group revealed that rice and cotton cooperatives were most often opposed to industry-based pooling.

Whether implementation of industry-based pools would result in borrowers leaving the BCs was also examined. The majority of respondents (66.5 percent) said their decision to borrow from the BCs would not be affected unless the reorganization resulted in their stated interest rate on BC loans increasing significantly. Another 16.8 percent responded that they would not borrow from a BC if the new pooling scheme caused their stated rate to increase even slightly. Implementation of industry-based pools would have no impact

Table 6.27

Effect of Industry-Based Pooling on the Decision to Borrow from a Bank for Cooperatives

II.20 If the pools were reorganized along industry lines, would this affect your decision to borrow from a BC?

Response	Frequency	Percent [1]
If my firm's stated interest rate on BC loans increased even slightly as a result of this new pooling scheme, my firm would not borrow from a BC.	29	16.8
My firm's decision to borrow from a BC would not be affected unless the stated interest rate increased significantly.	115	66.5
It would have no impact on my firm's decision	29	16.8

[1] Percentages based on 173 valid cases.

on the decision to borrow from a BC for 16.8 percent of respondents. (See Table 6.27). There were no significant differences in response patterns across firm size categories. Only among sugar cooperatives did the majority of respondents say that adoption of industry-based pools would not affect their decision to borrow from a BC.

The fact that the majority of respondents do not appear to be highly sensitive to changes in interest rates may reflect their loyalty to the BCs, or the fact that they view the patronage rebate as a windfall profit, rather than a component of the effective interest rate on a loan. The cooperatives surveyed were asked to indicate the extent to which they agree or disagree with the statement, "The potential patronage rebate from the BC is unimportant in our decision to borrow from them." More respondents disagreed with the statement (54.3 percent) than agreed (29.4 percent), with 16.2 percent remaining neutral.

Table 6.28

The Importance of Patronage Rebates in the Decision to Borrow from a Bank for Cooperatives

II.21 To what extent do you agree or disagree with the following statement: The potential patronage rebate from the BC is unimportant in our decision to borrow from them.

Response	Frequency	Percent [1]
Strongly agree	7	4.0
Agree	44	25.4
Neutral	28	16.2
Disagree	73	42.2
Strongly disagree	21	12.1

[1] Percentages based on 173 valid cases.

(See Table 6.28). This indicates that for the majority of cooperatives, the patronage rebate is a factor in their decision to borrow from a BC, whether or not they include it in calculating the effective interest rate. A greater percentage of smaller cooperatives reported that the patronage rebate was unimportant in their decision to borrow from a BC. When responses were broken down by commodity group, a larger percentage of farm supply cooperatives felt that the patronage rebate was unimportant in their decision.

To summarize, the survey results indicate that while the patronage rebate is considered when shopping for a loan, the respondents are not overly concerned with how earnings are divided up unless it makes the BCs no longer competitive with other lenders for certain classes of borrowers. Most borrowers seemed to be fairly indifferent to the choice of earnings distribution method, whether industry-based pools or otherwise, as long as a particular method does not significantly raise their cost of borrowing from a BC. The "bottom line" cost of credit to the individual cooperative is seen by most respondents as more important than fairness or equitable treatment among all borrowers.

6.4.3. BC Capitalization Requirements

The BCs are capitalized with the investments of members, who are required to purchase stock in the BC as a condition of borrowing. In addition to voting stock purchased by members, capital is obtained from participation certificates issued to non-voting members, as well as retained earnings. The stock purchase requirement and equity revolvement policies, which determine the borrower's ownership stake in the BC, are factors which may have an impact on the BCs' market share.

Each of the three BCs has its own capital plan, although they have some characteristics in common. By law, each BC requires of borrowers a minimum initial investment equal to the lower of $1,000 or two percent of the amount of the loan. Further capital contributions are determined by the board of directors of each bank.

At CoBank, additional capital contributions are based on the average loan volume over the last five years and are calculated to meet a target equity level set by CoBank's board of directors. The goals of the loan-based capital plan are to provide a stable equity base for the bank's activities, to equitably distribute responsibility for capitalization among

customers, and to comply with regulatory standards which call for a permanent capital ratio of seven percent of risk-adjusted assets. Equity retirement or additional capital contributions are made on a quarterly basis to meet the target levels.

The Springfield BC has the same initial investment of $1,000 or two percent of aggregate loan funds advanced. The bank uses an interest override capital plan. Beyond the initial investment, the borrower must purchase stock equal to a certain percentage of the interest payable by the borrower during the year. This amount is adjusted periodically by the board of directors in order to meet the Farm Credit Administration's permanent capital requirements. Equity retirement is at the discretion of the board, and is also implemented to meet regulatory capital requirements.

The St. Paul BC has the same initial stock purchase requirements as CoBank and Springfield. However, the St. Paul Bank uses a base capital plan in which each borrower is required to subscribe an additional amount of capital to meet the board's target equity levels. These contributions are made in proportion to the borrower's share of the bank's loan volume. Members who own more stock than is required to meet their share of the target equity level will have equity retired over the next four quarters, while those who are underinvested will be required to purchase stock over the next four quarters.

In addition to the above requirements, the BCs often require members to contribute advance capital for large, new term loans. For example, CoBank requires advance capital for loans exceeding $25 million for major construction projects.

Member-owned capital in the BCs is also acquired when stock is issued as part of the patronage refund. By law, at least 20 percent of the earnings allocated to patronage refunds must be paid in cash. The remaining portion, called non-cash patronage, is distributed to members in the form of equity in the bank.

The member-owned equity of each BC is retired at the discretion of its board of directors. The Agricultural Credit Act of 1987 explicitly prohibits any BC stock from being automatically retired. In practice, the BCs try to maintain a fairly regular equity revolvement schedule. In the past, the equity revolvement schedule for the St. Paul and Springfield BCs has been about six years.

Capitalization requirements may affect the BCs' market share in either of two ways. The stock purchase requirement may act to reduce BC market share to the extent that the borrower views it as an additional cost of doing business with the BCs. However, stock purchase requirements may be viewed as being comparable to the commitment fees often charged by commercial banks, although unlike the case of commitment fees, the cooperative borrowing from the BCs eventually gets its equity investment back.

The second way in which BC capitalization requirements may affect their market share is through the amount of time equity is tied up in the BC. If a cooperative currently borrowing from a BC decides to defect to another lender, it could take them five years to get back their investment in the BC. However, the capitalization requirements are a double-edged sword. The greater the amount of capital a cooperative has tied up in the BC, the greater their incentive to remain with the organization. On the other hand, if the stock purchase is seen as too high and the interval before equity revolvement too long, borrowers might choose to obtain what is perceived to be lower cost financing from another source. This is particularly a possibility if the borrower has an unusually large increase in its credit needs.

An important goal of the survey was to ascertain whether cooperatives view the capital contributions required for BC loans as a reason to seek financing from another source. Because borrowers obtaining loans from commercial banks and other sources are

Table 6.29

Effect of the Stock Purchase Requirement on the Decision to Borrow from a Bank for Cooperatives

II.22 To what extent do you agree or disagree with the following statement: The fact that a borrower must purchase stock in the BCs is a major deterrent to borrowing from them.

Response	Frequency	Percent [1]
Strongly agree	5	2.9
Agree	53	30.3
Neutral	27	15.4
Disagree	86	49.1
Strongly disagree	4	2.3

[1] Percentages based on 175 valid cases.

not required to purchase stock as a condition for obtaining the loan, cooperatives were asked whether the BCs' stock purchase requirement is a major deterrent to borrowing from them. A third of respondents (33.2 percent) either agreed or strongly agreed that having to purchase stock was a major deterrent to borrowing from the BCs. Only 15.4 percent of respondents were neutral on this issue, while the majority (51.4 percent) either disagreed or strongly disagreed. (See Table 6.29).

For the most part, borrowers seem to recognize that capital contributions are necessary to maintain a user-owned system. More small cooperatives than large ones felt that the stock purchase requirement was a major deterrent to borrowing from the BCs. A breakdown by commodity group revealed responses similar to those given by the population as a whole. The percentage of cooperatives who view the stock purchase requirement as a major deterrent to borrowing from the BCs was higher among non-borrowers than among borrowers, indicating that this may be an important reason why they lost customers. Of the 26 respondents who have no relationship with a BC, 17 of

them either agreed or strongly agreed that the stock purchase requirement is a major deterrent to borrowing from the BCs.

The next question asked cooperatives whether they felt that the level of capital contribution required by the BCs was a major deterrent to borrowing from them. More disagreed than agreed that the level of required capital was a problem. Thirty percent agreed or strongly agreed, 25.4 percent were neutral, and 44.5 percent either disagreed or strongly disagreed. (See Table 6.30). While dissatisfaction with the level of capital contributions does not appear to be widespread, it may be important if it affects loan volume. It appears to be an important reason why some cooperatives do not borrow from a BC. Of the 26 respondents who have no relationship with a BC, 15 of them either agreed or strongly agreed that the level of capital contribution required by the BCs is a major deterrent to borrowing from them.

Table 6.30

Effect of the Level of Required Capital Contribution on the Decision to Borrow from a Bank for Cooperatives

II.23 To what extent do you agree or disagree with the following statement: The level of base capital required by the BCs is a major deterrent to borrowing from them.

Response	Frequency	Percent [1]
Strongly agree	7	4.0
Agree	45	26.0
Neutral	44	25.4
Disagree	74	42.8
Strongly disagree	3	1.7

[1] Percentages based on 173 valid cases.

The smaller cooperatives reported more often than the larger ones that the level of capital contribution required by the BCs is a deterrent to borrowing from them. There

were no significant differences in responses across commodity groups. Borrowers who did business with CoBank reported slightly more often than St. Paul or Springfield borrowers that the level of capital they were required to contribute was a deterrent to borrowing from them. The majority (60 percent) of the cooperatives with no relationship to a BC felt that the level of capital required by the BCs was a deterrent to borrowing from them.

Cooperatives were also asked how the BCs might improve their capitalization methods. Although many respondents expressed satisfaction with the current system, the following suggestions were made. Not surprisingly, several respondents called for a reduction in the amount of capital that borrowers are required to contribute. They suggested doing this either by operating at cost (that is, allocating all earnings as patronage), by shortening the time to return equity, especially if a borrower's loan volume declines rapidly, or by increasing the proportion of dividends paid out in cash. However, implementation of any of these options could lead to the banks being undercapitalized.

A number of respondents called for increased use of retained earnings as a source of capital. A cooperative's earnings may be distributed to members in the form of cash or stock (deferred or non-cash patronage), in which case the cooperative is not taxed, or earnings may be retained and income tax paid on them. Some respondents wanted the BCs to keep the income and pay the tax, so that a greater proportion of capital needs could be satisfied out of retained earnings and a smaller proportion from member investments linked to loans. Several respondents also suggested that the BCs increase the amount of business they do with non-members in order to generate more earnings that could be retained.

Another suggestion was to tie capital contributions to the risk characteristics of loans, so that borrowers in less risky industries would be required to contribute less equity

to support their loan. A number of respondents also suggested that the BCs could improve their capitalization methods by making them more predictable. Greater certainty regarding the amount of equity contribution required, as well as the amount of patronage refunds, facilitates calculation of the effective cost of borrowing from the BCs. One respondent commented that the BCs should quit changing their capital plan every two years.

To summarize, the majority of borrowers seem to be sensitive to the need of the BCs for member-supplied capital, and are very aware of the means for raising capital that are available to cooperative businesses. As long as the BCs are able to provide an adequate return on members' investments in the banks, their capitalization methods do not seem to have a large negative impact on their market share.

6.4.4. Specialized Lending Expertise

Another benefit that the BCs offer their borrowers is specialized lending expertise. They have a better understanding of problems such as cyclicality and asset fixity that are important in agribusiness industries. Because BC lending is restricted to a smaller number of industries than commercial bank lending, BC management is able to gain a deeper understanding of these industries. By monitoring industry trends, the BCs may be able to play a role in facilitating the transition to an evolving marketing system for agricultural products.

The BCs also have a very good understanding of investment problems that are unique to cooperatively owned firms. Banks specializing in lending to cooperatives have a better understanding of their different ownership structure and financing needs. BC loan officers are also likely to be more well-versed in the technical aspects of their borrowing

firms. They may be able to advise their borrowers how to overcome organizational impediments (like the horizon problem) to successful investment. Their knowledge of a cooperative's membership structure may enable them to anticipate problems within their borrowers that could jeopardize investments. They may have a role in getting cooperative members to agree on and take actions in their long-run mutual interest. The BCs may also aid cooperatives in designing mechanisms and strategies to increase the commitment of members to their cooperative.

Financial planning assistance provided by the BCs is also an important determinant of their market share. Particularly for the smaller cooperatives, the BCs informally provide a fair amount of assistance in preparing business plans, as well as financial advice. Some of the BCs in the past have sponsored training programs for cooperative managers on how to do financial planning. Moreover, their monitoring of their borrowers' financial performance augments the monitoring role of cooperative boards of directors, which may not have the necessary expertise to do it well.

In their responses to open-ended questions about how the BCs differ from other lenders (discussed in more detail in the next chapter), many cooperatives mentioned that the BCs are unique in their understanding of the cooperative form of business organization. In a subsequent question, they were asked whether this was an important factor in deciding whether to borrow from the BCs. Three-fourths of the respondents (74.7 percent) agreed or strongly agreed that the BCs' understanding of cooperatives and the problems they face was an important factor in their decision to borrow from them. Only 8.6 percent disagreed or strongly disagreed that it was an important factor in their decision, while 16.7 percent were neutral. (See Table 6.31). There was general agreement among firms of all sizes that the BCs' greater understanding of cooperatives

Table 6.31		
Importance of the Banks for Cooperatives' Understanding of Cooperative Organization in Cooperatives' Borrowing Decisions		
II.25 To what extent do you agree or disagree with the following statement: The BCs' greater understanding of cooperative firms and the unique problems they face is an important factor in my cooperative's decision to borrow from them.		
Response	Frequency	Percent [1]
Strongly agree	46	26.4
Agree	84	48.3
Neutral	29	16.7
Disagree	14	8.0
Strongly disagree	1	0.6
[1] Percentages based on 174 valid cases.		

was an important factor in their decision to borrow from them. There were no significant differences in response across commodity groups.

Because their lending is basically limited to agribusiness and rural utilities, the BCs have developed an extensive knowledge base on the industries they lend to. Cooperatives were asked whether this industry-specific expertise is an important factor in their decision to borrow from the BCs. The majority of respondents (60.9 percent) either agreed or strongly agreed that the BCs' greater understanding of their firm's industries was important in their decision to do business with a BC. A fourth of the respondents were neutral on this issue, and 13.2 percent disagreed or strongly disagreed that the BCs' industry expertise was important in their decision. (See Table 6.32). Somewhat fewer large cooperatives agreed that the BCs' industry expertise is an important factor in their decision. A breakdown of responses by commodity group revealed that the BCs' industry expertise was most important for grain, cotton and poultry and livestock cooperatives, and least important for rice cooperatives.

Table 6.32		
Importance of the Banks for Cooperatives Understanding of Agribusiness Industries in Cooperatives' Borrowing Decisions		
II.26 To what extent do you agree or disagree with the following statement: An important factor in my firm's decision to borrow from the BCs is their greater understanding of the industries my firm is in.		
Response	Frequency	Percent [1]
Strongly agree	39	22.4
Agree	67	38.5
Neutral	45	25.9
Disagree	20	11.5
Strongly disagree	3	1.7
[1] Percentages based on 174 valid cases.		

Table 6.33		
Role of Banks for Cooperatives in Advising Borrowers on Raising Equity Capital		
II.27 To what extent do you agree or disagree with the following statement: The BCs are more likely than other lenders to provide guidance in overcoming problems in raising equity capital for new investments.		
Response	Frequency	Percent [1]
Strongly agree	13	7.6
Agree	62	36.0
Neutral	58	33.7
Disagree	28	16.3
Strongly disagree	11	6.4
[1] Percentages based on 172 valid cases.		

In addition, because the BCs are cooperatives themselves, they understand the capitalization problems that are unique to cooperatives. More respondents agreed (43.6 percent) than disagreed (22.7 percent) that the BCs are more likely than other lenders to

provide guidance in overcoming problems in raising equity capital for new investments. (See Table 6.33). Many more small cooperatives than large ones reported that the BCs assisted them in overcoming problems with raising equity capital. BC assistance in this area was reported most frequently by cotton, poultry and livestock, and grain cooperatives, and least often by dairy cooperatives.

Cooperatives were asked to report on the types of assistance they have received from a Bank for Cooperatives. The most frequently reported form of help from the BCs was assistance with long-range planning, used by 30.1 percent of respondents. Management assistance was the next most common form of help, reported by 23.7 percent

Table 6.34

Assistance Received From the Banks for Cooperatives

II.28 What types of assistance have you received from your Bank for Cooperatives?

Type	Frequency	Percent [1]
Advice on preparing business plans	35	20.2
Advice on preparing feasibility studies	35	20.2
Assistance with long-range planning	52	30.1
Training programs on financial planning	35	20.2
Advice on member education programs	19	11.0
Management assistance	41	23.7
Legislative representation	36	20.8
Other:_____ [2]	4	2.3
None of the above	69	39.9

[1] Percentages based on 173 valid cases.
[2] The category "other" includes: letter of credit structuring for export sales, industry information, education of board members, and data on farmer profitability.

of respondents. This was followed by advice on preparing business plans, advice on preparing feasibility studies, and representation of cooperatives interests in the legislative process. However, 39.9 percent of the respondents reported receiving "none of the above." (See Table 6.34).

When responses were broken down by firm size, smaller firms more often reported receiving advice on business plans, feasibility studies, long-range planning and management assistance than larger firms. On the other hand, larger firms reported receiving advice on member education programs and legislative representation on cooperative issues more often than smaller firms.

A breakdown of responses by commodity group revealed that farm supply and cotton cooperatives were the most frequent users of BC services, while rice and specialty cooperatives were the least frequent users. Both farm supply and cotton cooperatives relied heavily on the BCs for assistance with long-range planning and advice on preparing feasibility studies. Grain cooperatives reported using the BCs more for management assistance and advice on business plans, while dairy cooperatives relied on them for management assistance, and assistance with long-range planning.

After being asked what types of assistance they receive from the BCs, cooperatives were asked to indicate what types of assistance they would like to receive more of from the BCs. Most frequently cited was assistance with long-range planning (28.9 percent), followed by advice on preparing feasibility studies (26.5 percent) and training programs on financial planning (26.5 percent). (See Table 6.35).

When responses were broken down into firm size categories, it was discovered that firms with annual sales greater than $100 million had significantly less desire to have any of these services provided by the BCs. In general, demand for these services was greatest

Table 6.35

Assistance Desired From the Banks for Cooperatives

II.29 Which of these types of assistance would you like to receive more of from the Banks for Cooperatives?

Type	Frequency	Percent [1]
Advice on preparing business plans	26	15.7
Advice on preparing feasibility studies	44	26.5
Assistance with long-range planning	48	28.9
Training programs on financial planning	44	26.5
Advice on member education programs	32	19.3
Management assistance	23	13.9
Legislative representation	22	13.3
Other _____ [2]	3	1.8
None of the above	61	36.7

[1] Percentages are based on 166 valid cases.
[2] Those who checked "other" mentioned: An increased political role for the BCs, advice on business plans and feasibility studies on a fee basis, and training for directors on margins needed to remain financially strong.

among firms with annual sales less than $50 million. When responses were disaggregated into commodity groups, it was discovered that grain and farm supply cooperatives had the greatest demand for additional assistance, particularly in the areas of advice on feasibility studies and business plans, and assistance with long-range planning.

To summarize, the survey questions on the BCs' specialized lending expertise revealed that : 1) the BCs' understanding of the cooperative form of business organization is a very important factor in cooperatives' decision to borrow from them, 2) the BCs' industry expertise is also important to borrowers, but not as important as their understanding of how cooperatives work, 3) the BCs are somewhat more likely than other

lenders to aid cooperatives in devising ways to raise equity capital for new investments, and 4) assistance with long-range financial planning is the most common form of assistance received by borrowers, as well as the type of assistance they would like to receive more of in the future.

Overall, the BCs' specialized lending expertise appears to be very important in contributing to their ability to attract and keep their borrowers.

6.4.5. International Banking Services

CoBank plays an important role in financing exports of a wide variety of cooperative-sourced agricultural commodities. International loans to foreign buyers of U.S. agricultural products accounted for 29 percent of the bank's total loan portfolio in 1991. Because of the international nature of many cooperatively owned agribusinesses, it was hypothesized that the international lending services offered by CoBank might be an important factor leading cooperatives to borrow from them.

Table 6.36

Satisfaction with the International Banking Services of the Banks for Cooperatives

II.30 How satisfied are you with the BCs' international banking services?

Response	Frequency	Percent [1]	Percent of those using services [2]
Very satisfied	13	7.5	26.0
Somewhat satisfied	25	14.5	50.0
Not satisfied	12	6.9	24.0
Not applicable	123	71.1	—

[1] Percentages based on 173 valid cases.
[2] Percentages based on 50 respondents who use international services.

Of the 173 cooperatives responding to this question, 50 reported having used CoBank's international banking services. Of these firms, 26 percent reported being very satisfied, 50 percent were satisfied, and 24 percent were not satisfied with CoBank's financing of their international transactions. (See Table 6.36). Most of the users of the BCs international banking services fall into the size category of $51 to $99 million in annual sales. Responses of firms in different size categories and commodity groups did not differ significantly from the responses of the group as a whole.

Exporting cooperatives were asked whether the quality of CoBank's international lending was a major reason to have a relationship with them. Most respondents (43.9 percent) were neutral on this question. Only 10.6 percent agreed or strongly agreed that international lending was a major reason to borrow from the BCs, while 45.6 percent

Table 6.37

Importance of International Banking Services in the Decision to Borrow from a Bank for Cooperatives

II.31 To what extent do you agree or disagree with the following statement: The quality of the BCs' international banking services is a major reason we have a relationship with them.

Response	Frequency	Percent [1]
Strongly agree	3	5.3
Agree	3	5.3
Neutral	25	43.9
Disagree	19	33.3
Strongly disagree	7	12.3

[1] Percentages based on 57 valid cases.

disagreed that it was a major reason. (See Table 6.37). There were no significant differences in responses across industries or commodity groups. Although international lending services are important for many cooperatives, even for those who use these

services, there were apparently other more important factors leading them to do business with the BCs.

Cooperatives were asked whether they wanted any international banking services that were not offered by the BCs. Almost all of the respondents (94.5 percent) were satisfied with the current product offerings, which include letters of credit and a variety of products structured to satisfy the unique needs of individual borrowers and transactions.

Table 6.38

Desire for International Banking Services Not Offered by the Banks for Cooperatives

II.32 Are there any international banking services that you want that are not offered by the BCs?

Response	Frequency	Percent [1]
Yes	3	5.5
No	52	94.5

[1] Percentages based on 55 valid cases.

(See Table 6.38). Those respondents who were not satisfied with current product offerings commented that they wanted more creative programs for financing the export of branded products, as opposed to fungible commodities. CoBank is now making efforts in that direction. It currently provides little international financing of value-added products, but expects to do more in this area, as value-added products exceed bulk exports of agricultural commodities and now account for over half of the total value of U.S. exports.[2]

[2] CoBank 1991 Annual Report, p. 13.

6.4.6. Other Factors

Although it is difficult to measure their impact on cooperatives' borrowing decisions, intangible factors such as loyalty and a belief in the cooperative way of doing business are also important in determining BC market share. On Wall Street there is a saying that "loyalty is a basis point." It is probably stronger among BC borrowers for whom cooperatives provide a competitive yardstick for assessing the performance of investor-owned firms and a way of changing in their favor an often-skewed balance of market power.

Table 6.39

Importance of Loyalty in the Decision to Borrow from a Bank for Cooperatives

II.33 To what extent do you agree or disagree with the following statement: An important reason why we continue to borrow from the BCs is that we believe it is important to remain loyal to a cooperative of which you are a member.

Response	Frequency	Percent [1]
Strongly agree	16	9.5
Agree	70	41.4
Neutral	49	29.0
Disagree	24	14.2
Strongly disagree	10	5.9

[1] Percentages based on 169 valid cases.

An important research question was to determine how important cooperative ideology is as a determinant of BC market share, especially among the larger cooperatives with greater access to alternative sources of financing. In the survey, cooperatives were asked how important loyalty is in their decision to borrow from the BCs. More respondents agreed (50.9 percent) than disagreed (20.1 percent) that an important reason why they choose to borrow from the BCs is the belief that it is important to remain loyal

to a cooperative of which you are a member. Remaining neutral on the loyalty issue were 29 percent of respondents. (See Table 6.39). Firms in different size categories appeared to be equally loyal to the BCs. Loyalty was an important reason for borrowing from the BCs for more farm supply, grain, rice and cotton cooperatives than for firms in other commodity groups. As further evidence of loyalty, according to CoBank's 1991 annual report, 90 percent of the cooperatives that borrow from the bank have been doing so for ten or more years.

BC loan officers reported doing a lot of "handholding" and advising for their customers. While some borrowers value this aspect of their relationship with the BCs, it was thought that others might view it more negatively. Cooperatives were asked to indicate the extent to which they agree or disagree with the statement, "The BCs interfere too much in the management of their borrowers." Far more respondents disagreed with the statement (50.5 percent) than agreed with it (20.3 percent), with 29.1 percent neutral

Table 6.40

Opinions on the Banks for Cooperatives' Guidance of Borrower Decisions

II.34 To what extent do you agree or disagree with the following statement: The BCs interfere too much in the management of their borrowers.

Response	Frequency	Percent [1]
Strongly agree	10	5.8
Agree	25	14.5
Neutral	50	29.1
Disagree	73	42.4
Strongly disagree	14	8.1

[1] Percentages based on 172 valid cases.

on this issue. (See Table 6.40). Smaller borrowers reported far more often than larger

borrowers that the BCs interfere too much in their management. This is in spite of the fact that smaller borrowers also wanted more management assistance from the BCs. A breakdown of responses by commodity group showed that farm supply cooperatives believed more than any other commodity groups that the BCs interfere too much in cooperative management.

Table 6.41

Disciplinary Actions By the Banks for Cooperatives

II.35 Have any of the following actions been taken by the Bank for Cooperatives that you borrow from?

Action	Frequency	Percent [1]
Verbal encouragement to follow a certain course of action	56	33.1
Verbal pressure to follow a certain course of action	20	11.8
Adding of more restrictive loan covenants to necessitate a certain course of action	51	30.2
Threats to call in a loan if the cooperative did not follow a certain course of action	18	10.7
None of the above	84	49.7

[1] Percentages based on 169 valid cases. Percentages do not add to 100 because respondents were permitted to check more than one response.

The survey attempted to determine how many of the BCs' borrowers had experienced various types of disciplinary actions on cooperative management taken by the BCs. A third of respondents (33.1 percent) reported that the BCs had given them verbal encouragement to follow a certain course of action. A small percentage of them (11.8 percent) reported getting verbal pressure from the BCs to follow a certain course of action. Thirty percent of respondents experienced the BCs adding more restrictions to their loan covenants for seasonal financing in order to force the cooperative to take a

certain course of action. For eleven percent of the respondents, the BCs had threatened to call in their loan if they did not follow a certain course of action. Half of the respondents, however, had experienced none of these forms of BC influence on management decisions. (See Table 6.41).

Smaller cooperatives reported more often than larger cooperatives that they had received both verbal encouragement and verbal pressure, as well as threats to call in a loan. Larger cooperatives reported more often than smaller ones that the BCs added more restrictive loan covenants on their seasonal financing to force a certain course of action. Farm supply, grain and sugar cooperatives were the commodity groups most often reporting that the BCs had taken some action to influence the decisions of their management. Farm supply and grain cooperatives reported most often that this took the form of verbal encouragement to follow a certain course of action, while sugar cooperatives reported most often that more restrictive loan covenants were used to necessitate a certain course of action.

One respondent commented that the BCs' attempts to influence the decisions of cooperative management should be viewed as an indication only of the economic difficulties of the cooperative, not the BCs' propensity to interfere. The treasurer of one of the BCs' largest borrowers commented that lenders have the right, as well as the responsibility, to monitor and enforce loan agreements. The BCs have a responsibility to take actions that will protect the common interests of all shareholders of the BCs. It is a fine line, however, that separates legitimate action from interference, and it is a line that will be perceived differently by borrowers and lenders. Of interest here is whether the borrowers' perceptions of undue interference from the BCs leads them to seek financing from another source.

Cooperatives were asked to indicate the extent to which they agree or disagree with the statement, "BC interference in cooperative management is a major deterrent to borrowing from them." More respondents disagreed with the statement (56.5 percent) than agreed (16.5 percent), while 27.1 percent of respondents remained neutral on this

Table 6.42

Effect of the Banks for Cooperatives' Intervention in Cooperative Management on Borrowing Decisions

II.36 To what extent do you agree or disagree with the following statement: BC interference in coop management is a major deterrent to borrowing from them.

Response	Frequency	Percent [1]
Strongly agree	10	5.9
Agree	18	10.6
Neutral	46	27.1
Disagree	70	41.2
Strongly disagree	26	15.3

[1] Percentages based on 170 valid cases.

question. (See Table 6.42). Thus the majority of respondents do not seem to view intervention by BC management as a reason not to borrow from them. Cooperatives in the smallest size category (annual sales less than $30 million) reported more often than larger firms that BC interference in their management was a major deterrent to borrowing from them. Rice and cotton cooperatives reported more often than firms in other commodity groups that they were deterred from doing business with a BC by its interference in their management.

Although the interest rate on a loan is the most important determinant of where a cooperative will obtain financing, respondents mentioned that a number of other factors also enter the picture. A large California cooperative reported that it calculates effective

interest rates from various lenders and chooses the lowest, but that the BC wins if there is a tie. This firm calculates stock purchase requirements and expected patronage dividends into the effective rates that it uses for comparison purposes. In addition, the respondent commented that the legal documentation on CoBank loans is usually simpler than that required by insurance companies, but that this is usually calculated into the effective rate in the form of estimated legal expenses.

One large dairy cooperative reported that exclusivity was a factor in their decision of where to obtain financing. They seek to avoid a potential conflict of interest that could arise if a lender was financing both them and their competitors. Another respondent wanted a lender who could understand the risk in the business as related to the industry, which requires constant analysis and interpretation of firm and industry data. They reported looking for a lender who will be a good partner in the business plan, not simply in when times are good and out when times are bad. Another respondent commented that duration of financing was also a consideration, as insurance companies generally offer longer-term financing than the BCs.

Intangible factors, such as personal relationships and social closeness, also influence the decision to seek financing from a BC. The manager of an Iowa grain cooperative reported that his firm's relationship with the BC loan officer is an important reason for doing business with them. He said that the loan officer is closely involved in the cooperative's strategic planning and is viewed as an asset to the firm.

6.5. Conclusions

This chapter has presented data on the competitive position of the BCs and has begun to analyze the factors influencing the BCs' share of the cooperative credit market.

Research questions were identified in the areas of loan pricing and security requirements, BC capitalization requirements, specialized lending expertise, international lending and cooperative ideology. These questions have attempted to shed light on some of the factors which contribute to and detract from BC market share, which has a direct impact on the banks' ability to coordinate investments in industry capacity.

The BCs are clearly the dominant lenders to the cooperative sector in the United States. Not only do they provide more long-term debt financing than any other lender, they are looked to by cooperatives as an important source of financial and management advice. The BCs' dominant presence in the credit market for farmer cooperatives puts them in a position to influence the match of industry capacity and demand by using information obtained from borrower accounts to guide the investment decisions of other borrowers.

However, the BCs' ability to influence investment coordination is limited by their ability to retain as customers the majority of cooperatives in particular markets where cooperatives have a large market share relative to investor-owned firms. This, in turn, depends on their ability to deliver benefits to members in the form of favorable loan prices, patronage refunds, specialized lending expertise, and other less tangible benefits.

The most important determinants of BC market share, aside from the loan price relative to that of competitors, are the BCs' policies regarding the allocation of operating expenses and credit risk costs. Cooperatives seem to be most aware of the potential for inequities in these two areas, and are more likely to be driven away by perceived unfairness in these areas than by the availability of desired loan products, the need to contribute capital to the BC, or inequities in the allocation of BC earnings. On the positive side, cooperatives are drawn to the BCs by the specialized lending expertise that

they offer borrowers, as well as by a sense of commitment to the cooperative way of doing business. In order to retain their market share, BC management must be sensitive to the distribution of operating expenses and credit risk costs across borrowers.

The next chapter will delve into the means whereby the BCs gain and use information about planned investments in their loan decision making process, as well as how this affects investment coordination.

Chapter 7

THE COORDINATION OF INVESTMENTS THROUGH CREDIT DECISIONS

This chapter is concerned with how the BCs obtain and use industry capacity information in their lending decisions. Although many activities of the BCs may contribute to investment coordination, the credit decision is the most important. As discussed in Chapter 5, two things are necessary for banks to coordinate investments: 1) access to investor information, of which BC market share is a primary determinant (see Chapter 6), and 2) the banks' use of this information in their decisions to extend or deny credit for capacity expansions. This chapter will focus on the second requirement. First, the loan decision making process for capital investments is outlined, and then the primary sources of information used in credit decisions are examined. Next, the coordination of investments is discussed. Finally, the chapter will consider cooperatives' opinions on the role of lenders in general in investment coordination, and more specifically on the role of the BCs. Much of the information presented in this chapter is based on interviews with current and former BC officials and cooperative managers. They are listed in Appendix D.

7.1. Loan Decision Making in the BCs[1]

Loan decision making in the Banks for Cooperatives is governed by a number of formal authorities, i.e., those whose role is formally documented by law or in documents laying out the banks' policies. In addition to formal sources of authority, the discretion of the individual decision makers involved in a particular transaction plays an important role in the coordination of investments. This section identifies who is involved in loan decisions and what legal and organizational constraints they encounter, and outlines the steps in loan decision making.

7.1.1. Formal Authorities in BC Credit Decisions

The basic authorities of the Farm Credit System are granted by the Farm Credit Act, as amended. The Farm Credit System is regulated by the Farm Credit Administration, which passes specific regulations governing the System's activities. These regulations are fairly specific on some items, but in general give broad authority to the BCs to determine how credit decisions are actually carried out.

The Farm Credit Act also lays out specific eligibility rules which allow firms to borrow from the BCs. The BCs are permitted to lend to agricultural, aquatic and rural utility cooperatives, as long as 80 percent of its voting control is in the hands of agricultural or aquatic producers or federations of cooperatives in which producers control 80 percent of the firm's voting equity. Any entities eligible to borrow from the Rural Electrification Administration or the Rural Telephone Bank are also eligible to borrow

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[1] Much of this discussion of BC loan decision making is from written and personal communication with William H. Erickson, a loan officer with the St. Paul Bank for Cooperatives. The description of the decision making process is specific to the St. Paul BC, but the process is similar at the Springfield BC and the CoBank banking centers. CoBank's decision making process for larger credits is described in section 7.1.2.

from the BCs. Another condition of eligibility is that a cooperative must do at least 50 percent of its business with its members.

The Farm Credit Administration has the authority to review the system institutions and correct any problems. The quality of all BC assets is examined and given a rating according to the Uniform Classification System (UCS). The FCA has the authority to require the BCs to take corrective action on the lower quality loans. This is accomplished through a set of formal enforcement powers, including the power to remove officers, impose civil money penalties, and issue cease and desist orders.

In addition to the formal authorities defined at the federal level, the individual BCs have formal policies and procedures which comply with FCA regulations, but are more specific with regard to bank operations. The policies and procedures of the BCs regarding lending are fairly general in comparison to lending guidelines for Production Credit Associations and Federal Land Banks, other FCS institutions. The BCs' approach to lending does not provide a "cookbook" of requirements that the borrower must meet, but instead puts more emphasis on the responsibilities of the loan committee to review and evaluate credit applications.

Using the St. Paul BC as an example, the authority for approving loans is formally delegated to the loan committee, which is comprised of the bank's senior credit management staff. The loan committee then makes a formal decision regarding whether to delegate lending authority to "junior" or "delegated" committees. Typically there have been one or two lower committee levels for high quality loans and lower dollar exposure borrowers. The loan committee also retains authority for loans requiring CoBank participation, as well as any loans which require special pricing.

In all cases, the St. Paul BC requires a minimum of two persons on a loan committee, with a strong emphasis that at least three is preferred. The author of the loan action, who has had most of the contact with the borrower regarding a particular loan, has been a voting member of the committee. The loan committee chairman or a designated alternate is also required to vote.

CoBank has the authority to establish lending limits for the two BCs (St. Paul and Springfield) which chose not to merge in the 1989 consolidation of the BC system. St. Paul and Springfield may not lend more than 25 percent of total capital for term loans and 35 percent for seasonal credit. Any loan which exceeds this lending limit requires participation by CoBank. CoBank conducts its own analysis before participating in the loan and also relies on decision making by committee.

Technically, the boards of directors of the BCs have the authority to set broad loan policies for bank management to follow. In general, they do not directly intervene or take any action to influence a loan decision, but they may do so indirectly by setting policies. The boards are informed of sensitive credit situations, but this is mainly informational and is seldom acted upon.

7.1.2. The Loan Decision Making Process

The loan decision making process in the St. Paul BC can be broken down into several steps: 1) initial borrower contact, 2) initial loan analysis, 3) formal loan application, 4) loan approval, and 5) on-going monitoring.

The initial contact between a potential borrower and a BC can vary a great deal, depending on the status of the borrower (i.e., a newly formed cooperative, a new borrower, a cooperative joint venture, etc.). Moreover, the amount of background work

on the feasibility of the proposed investments varies greatly from one borrower to the next, depending on the sophistication of the borrower and the size and complexity of the investment.

The St. Paul BC encourages the prospective borrower to have an independent business analysis completed on the proposed project. The scope of the analysis and the bank's requirements vary a great deal depending on the nature of the proposed investment. However, the St. Paul BC does require a cooperative to use outside expertise in preparing the feasibility study if the investment is to be made in a highly volatile or cyclical market, if the investment is highly sensitive to economic variables, if it is in a rapidly changing or highly competitive industry, or if the project is highly technical or capital intensive. Table 7.1 presents the bank's guidelines on the use of outside expertise in doing the feasibility study.

As part of the initial contact with the borrower, the bank tries to establish a direct relationship with the borrower's board of directors in order to ensure their involvement in the decision making process.

In the second step in the loan decision making process, the formal analysis of the project begins. Contrary to what might be expected, the formal loan application is one of the last steps in the process. The bank's initial analysis of the project is very informal. Once the feasibility study has been completed by the borrower, the loan officer prepares a credit report, which is eventually used in the loan committee's decision. The credit report contains recommendations for an appropriate monitoring process, security requirements, controls over the disbursing of funds, etc., in addition to general recommendations regarding the structure of the project and the proposed financing. (A detailed outline of the contents of the credit report is presented in Appendix F). However, before the loan

Table 7.1

Guidelines of the St. Paul BC on the Use of Outside Expertise

USE OF OUTSIDE EXPERTISE

	Requires complete analysis from an outside, impartial source with specialized expertise	Analysis requires technical or specialized input from an outside source	Analysis can be completed by the borrower management team
Marketing	• Project requires substantial gain in market share • Volatile/cyclical market • Brand name versus commodity • Dominated by a few • Rapidly changing market	• Moderate market share increase required • Reasonably stable market • Many competitors	• Essentially maintaining market share in a growth market • Market understood by borrower • Stable market - past & future • Small market share relative to total market
Economics	• Highly sensitive to one or two variables • High degree of economics of size • Complex revenue/cost structure	• Moderate sensitivity to cost/revenue variables • Moderate economies of size • Cost/revenue numbers available	• Costs and revenues well understood by borrower and Bank • Low economies of size
Size of Project (Dollars)	• Entire repayment is based on project payback • Project cost has substantial impact on borrower B/S • New Venture	• There is outside cash flow to support substantial project repayment, or • Stretches B/S leverage but still acceptable	• Outside cash flow can largely support repayment • B/S cushion remains after project completion • Borrower familiar with construction projects
Type of Project	• New enterprise for borrower • New enterprise for Bank • Highly competitive industry • Very sophisticated industry • Rapidly changing industry	• Borrower and Bank have some related experience • Highly technical, competitive or rapidly changing industry	• Borrower and Bank have vast experience in project type • Technical requirements, competitive aspects, and industry trends are generally well understood
Type of Fixed Assets	• Capital intensive • Highly technical/specialized • Lengthy construction period • Requires sophisticated planning and coordination	• Moderate capital intensity • Moderate construction period (3 - 9 months) • Borrower, Bank and many contractors familiar with the necessary construction	• Requires low capital investment relative to business size • Short construction period (2-3 mos) • Available resale market/low tech assets • Can be installed by local contractors
Membership	• Unfamiliar with industry • Questionable level of commitment • Low concentration of membership base • Questionable financial condition	• Varying degree of understanding • Mixed feelings of commitment • Questionable membership base and their financial condition	• Are familiar with project type • Solid commitment to project • Broad, stable membership • Sound financially

committee makes its decision, the bank informally says yes or no, and may set limits on the degree to which it is willing to be involved.

In the third step, a formal loan application is made if the bank has informally agreed to finance the project. A formal report is submitted to the loan committee with specific recommendations. In many cases, a proposed loan agreement is presented for the committee to review. In major projects, the bank's legal counsel would also review all of the documents.

The fourth step in the loan decision making process is the actual approval of the loan agreement. Final authority for determining the contents of the loan agreement and any future modifications to it rests with the loan committee. The loan agreement also specifies future actions by the borrower which require bank approval.

Once the loan is approved, the loan officer has primary responsibility for coordinating the monitoring of the borrower's compliance with the provisions of the loan agreement. The loan officer is assisted in this task by a credit support group. In the event that the borrower's situation changes, the loan committee may modify the original agreement, subject to approval of the borrower.

For credits which exceed the lending limits of the St. Paul and Springfield BCs, CoBank participates in the financing. Participated loans go through a double review process. First, they are reviewed and approved at the originating bank, and then they are reviewed and approved by CoBank. All CoBank loans must be approved by a loan committee made up of at least three people. For loans originating at CoBank, approval authority is delegated to various committees within the bank, but generally, the larger and more complex the credit, the greater the number of senior people required to make up the committee. For example, the loan committee for agribusiness working out of the

Atlanta banking center (or other regional offices of CoBank) may be granted authority to approve loans up to a certain dollar amount. Anything above that would have to be approved both by the committee at the banking center, as well as the senior loan committee, which is headed by CoBank's chief credit officer and includes the bank's corporate economist. In addition to the senior loan committee and the committees working out of the regional banking centers, CoBank has seven delegated loan committees, five in agribusiness, one for utilities, and one for international loans. This enhances industry specialization in loan decision making.

Generally almost all of the analysis of CoBank loans is done at the banking centers. This analysis is then supplemented by information gathered by the National Credit Services Division, which monitors the industries CoBank lends to on an on-going basis. This is discussed in greater detail below.

7.1.3. The Role of the Loan Officer and Loan Committee

Because the loan officer and loan committee have considerable discretion in credit decisions, their role is worthy of examination in greater detail.

Unlike loan officers in commercial banks, BC loan officers are not granted individual lending authority. Instead, all decisions are made by committee. The BC credit staff has often considered whether individual loan making authority is preferable to decision making by committee, but they feel that having the loan officer serve as part of the committee allows for stronger personal relationships and provides a second opinion to check the analysis of the loan officer.

The loan officer serves as the primary link between the borrower and the loan committee. Because of his or her responsibility to present specific recommendations,

analysis, and justifications to the loan committee, the loan officer has a great deal of influence over the final credit decision. An implicit rule in the process is that any action presented to the loan committee must be in the form of specific recommendations that can be agreed to, modified, or rejected. The light in which the analysis is presented is influenced by what the loan officer decides to recommend and defend. Because lending guidelines are fairly subjective rather than rule-oriented, the loan officer plays an important role in the process.

BC officials reported that, while their banks have considerable industry specialization by loan officers, it is mostly driven by geography, rather than any specific bank policy. For example, loan officers covering Arkansas might specialize in rice, because it is grown there, while those in California would specialize in fruits and vegetables. Most of the BCs (including CoBank's banking centers) have certain loan officers that specialize in lending to larger customers or rural utilities. Those who focus their lending efforts at the local level often end up specializing in the grain and farm supply industries.

Officials at the St. Paul Bank reported that they have no complete purists. While they recognize the importance of industry expertise, they do not want loan officers to have a completely exclusive focus, because working in more than one area broadens a loan officer's perspective and often improves the quality of his or her analysis. At the St. Paul Bank, two broad categories of specialization are local cooperative lending, and lending to the larger regional and specialty cooperatives. The normal employment track is for a loan officer to begin doing local cooperative lending and, if desired, to move up into regional/specialty lending when more experience has been gained. Further specialization has taken place within the regional/specialty lending area. Individual loan officers have

developed more specialized skills in areas such as rural utilities, sugar processing, dairy marketing, finance and other areas. These individual specialists also provide brief quarterly reports on the major industries for the loan committee and the bank's management.

The loan committee members draw on their own lending experience in responding to the loan officer's recommendations. The committees are very active as an informal sounding board during the initial stages of the analysis. The loan committees also provide some degree of consistency in lending decisions over the banks' broad geographic and varied customer base.

7.1.4. Role of the Boards of Directors

All of the BC officials interviewed stressed that the banks' boards of directors have no direct involvement in credit decisions. The senior credit officers reported that they strictly guard against treating customers with representatives on the board differently than any other customer. Major credit decisions are reported to the BC boards in order to keep them informed, but it is always done in a post-review fashion. BC officials find that board members want bank management to be objective and not play favorites among borrowers. They reported that the board reviews the bank's business plan and looks at the bigger picture of how to maintain the bank's performance in a number of different dimensions, only one of which is credit quality.

7.2. Sources of Information in BC Credit Decisions

In Chapter 1 it was noted that for investment coordination purposes, the most important element of the feasibility study of a proposed investment was the firm's

prediction of what capacity additions might be undertaken by competitors. Some firms rely on an extensive intelligence network to obtain this information. An important part of this research is to determine how much and what type of information on rivals' capacity expansion plans the borrower brings to the bank, and to what degree the bank supplements this information from its own sources, including monitoring the investments plans of its current borrowers. This section considers three important sources of information used in credit decisions: feasibility studies, market information gathered by the BCs, and data from borrower accounts.

7.2.1. Feasibility Studies for Loan Applications

The feasibility studies done for BC loan applications vary greatly in sophistication and detail, depending on the size and complexity of the project and the financial condition of the borrower. CoBank officials reported that they always require the borrower to have completed a feasibility study on any project which will have a substantial impact on the cooperative's financial position. They stressed that they don't want the bank involved in putting together the feasibility study, because they don't want to be that closely involved in the investment decision if the investment subsequently fails. However, they do evaluate and critique the study when it is presented to them, and may require the borrower to develop additional assumptions or scenarios to address the bank's concerns. The CoBank credit staff relies heavily on the loan officer to know whether the information contained in a feasibility study is detailed enough to base a decision on it.

Senior credit officials at the St. Paul BC said that in most cases the borrower will simply provide the bank with an annual budget which specifies a certain amount for capital expenditures for the coming year. In many cases it is something that will not have

a huge impact on the financial position of the cooperative, such as replacement of fertilizer equipment or upgrading the scale of the elevator, and the BC credit staff will not spend very much time critiquing the borrower's projections. However, if the loan request is for a large project, for example, a new ethanol plant or a durum mill and pasta plant, the bank may work with the borrower for months, going through many scenarios and iterations of the financial projections, and sometimes relying on outside expertise.

St. Paul officials also noted that borrowers vary considerably in the quality and sophistication of their feasibility studies because some have better management than others and, in the case of local cooperatives, some have much better support from the regional cooperatives than others. The long-term relationships that the BCs have with most of their borrowers and the detailed understanding of their management teams enhance the banks' ability to assess the quality of the information underlying the investment decision and the risks associated with it.

7.2.2. Market Intelligence

Most large firms have in place some type of market intelligence system to gather information on the strategic moves of competitors. Smaller firms, especially cooperatives, often do not have many resources to devote to this activity. Furthermore, because there is no secondary market for their stock, cooperatives in cooperative-dominated industries are deprived of one source of information, stock prices, which reflect the monitoring by securities analysts and others of information regarding planned capacity expansions. For this reason, the market intelligence system of the BCs is in many cases an important source of information for coordinating investments.

Within CoBank, the National Credit Services (NCS) Division has the responsibility of monitoring the industries the bank extends loans to, as well as establishing credit policy for the bank, playing a role in the loan approval process, buying participations from St. Paul and Springfield, and managing the bank's allowance for loan losses. The NCS division is split into two parts. On the credit side, there are six people who specialize in particular industries, and on the economics side, there are four people who focus on both micro and macro issues. They forecast economic trends, as well as examine how the health of local economies might affect a particular credit.

The NCS division produces a series of quarterly reports looking at the major commodity groups as part of the process of determining the bank's quarterly allowance for loan losses. They subscribe to Wharton Economic Forecasting, and a wide variety of USDA and trade publications, as well as several commodity reporting services, like Sugar Newsprint. In addition, they maintain a database of county-by-county economic information. They also subscribe to a number of services and publications which provide information on competing lenders and how they are structuring deals.

Most of the information gathered by the NCS division is used internally and is specific to the context of a particular loan. For example, if they are financing a cellular phone system in Georgia, they will want to know the economic conditions in the eight counties that make up the market area. This information is transmitted to borrowers informally in negotiations over the financing of a proposed project, rather than in the form of publications regularly disseminated to borrowers, although CoBank's chief economist does distribute to borrowers a regular article on macroeconomic conditions. However, the head of the NCS division viewed CoBank's informational role as mainly providing advice to borrowers on financing issues, for example, how they should manage

their balance sheets, how much debt they can carry, what their liquidity should be, rather than on the status of their industry. He stressed that the expertise of the BCs is in providing financing, not in assessing conditions in the borrower's industry. He said, "They know a lot more about their business than we do."

The head of NCS felt that the division does an adequate job, given its resources, but that it would be desirable to take a more in-depth look at certain industries on a case-by-case basis. CoBank recently hired an outside consultant to do this for the dairy industry. However, CoBank officials in general seemed to want to be cast in the role of neutral providers of financial services, rather than active coordinators of cooperative investments.

The St. Paul and Springfield BCs also collect their own market intelligence, which is used internally to support credit decisions. Both banks also receive information from the NCS division at CoBank, particularly when CoBank reviews the larger loans originated by St. Paul and Springfield that require CoBank participation.

7.2.3. Borrower Accounts

For investment coordination purposes, one of the most important sources of information on industry capacity and planned investment is borrower accounts. The number of firms doing business with the BCs in a particular industry determines the extent of the banks' access to investment information from monitoring the plans of borrowers.

All of the BCs maintain electronic databases of borrower financial information. The data is used to evaluate the financial position of individual borrowers relative to a group of their peers, as well as to monitor conditions in the cooperative portion of the industries they lend to. Borrower financial data is confidential and used only internally by

the BCs, although loan officers often extract relevant information to use in advising a borrower's management team about how their cooperative compares to others that are a similar size and type of business. For example, see the financial ratios for farm supply and grain cooperatives borrowing from the St. Paul BC, presented in Appendix F (Contents of the Credit Report).

The BCs do not publish aggregated borrower financial data. CoBank is still integrating the databases from the former district banks that now comprise CoBank, and is not in a position to easily compile and release nationally aggregated data. The St. Paul Bank is in the process of investing in a new data processing system and has been holding meetings with CoBank to explore the potential for making the systems compatible. This would facilitate a consolidation of St. Paul and CoBank, which the senior credit officers at the St. Paul Bank believe will eventually happen.

Once the databases are integrated, CoBank officials anticipate being able to make aggregated borrower financial data publicly available. However, they stress that they will have to be very careful in distributing and using the data not to violate the promise of confidentiality that they extend to customers. The banks would have to be very careful in distributing data on smaller groups of borrowers, such as sugar cooperatives, because disclosure issues would arise. However, they would have greater reporting flexibility with the large, geographically dispersed group of grain and farm supply cooperatives. A more formalized and widespread dissemination of cooperative financial data, of which the BCs are the most complete source, would allow groups other than BC management to monitor the match of capacity and demand in cooperative-dominated industries. Although no group would have as much ability to influence the outcome of cooperatives' investment

decisions as the BCs, they might provide an added source of discipline on the capacity expansion process of cooperative firms.

7.3. Coordination of Investments Through Credit Decisions

In the terminology of systems science, a stable dynamic equilibrium is only possible in a closed system, that is, one that is free of influences from the environment outside the system. By analogy, if the Banks for Cooperatives provided all of the credit to the cooperatives in an industry, and those cooperatives faced no competition from investor-owned firms, the BCs would be able to control the flow of credit into the industry, simply turning off the tap when investments in capacity are fairly well-matched with demand. In the real world, however, such control by a single institution is not possible (and, many would argue, not desirable). Cooperatives do not have a 100 percent market share in any industry, and the Banks for Cooperatives do not supply 100 percent of the credit used by cooperatives. Therefore, "control" becomes "influence." In the absence of a stock market-based coordinating mechanism, the BCs do have considerable influence on the capacity expansion decisions of their borrowers. This section explores the factors which contribute to and detract from the banks' ability to influence the match of industry capacity and long-run demand. The information presented is based on interviews with senior members of the credit staff at each of the BCs.

7.3.1. Examples of Investment Coordination by the BCs

In many areas and industries, the BCs have played a central role in influencing the match of industry capacity and demand through their decisions to extend credit and by advocating mergers and joint ventures among cooperatives where they make economic

sense. For example, in the mid-1980s, the credit staff at the St. Louis BC (now part of CoBank) recognized that considerable excess capacity existed among local grain and farm supply cooperatives in their district. The BC did financial modelling to examine the possible cost savings of mergers among various combinations of borrowers. The bank then initiated talks among the borrowers they had identified as potential merger candidates.

The merger activity was driven by a very strong-willed individual on the credit staff who was very good at monitoring market trends. Under his leadership, the loan portfolio of the St. Louis BC went from about $465 million in 1984 to about $264 million in 1986, down from a portfolio of over $711 million in 1980. This person was responsible for many of the local cooperatives consolidating and cleaning up their balance sheets, which saved many of them from bankruptcy.

Another example of a BC influencing the match of capacity and demand was the St. Paul Bank's financing of expansions of grain elevators to handle unit train shipments. This generally involved expanding the storage capacity of the elevator and laying additional track to accommodate the loading of longer trains. St. Paul BC officials reported that they spent a considerable amount of time in the early 1980s evaluating how many cooperatives along the same track fifteen miles apart needed to have unit train shipping capacity. This involved having a good understanding of grain production in the region and the capacity of existing elevators to handle it, as well as the effect of incremental expansions of grain storage capacity on the profits of all the grain cooperatives competing in the region. Access to this information was possible because they were lending to almost all of the grain cooperatives in the area. The BC credit staff used this information to counsel cooperatives considering expansion, and to encourage mergers where they made economic sense. Over the decade, the number of elevators

declined, with some large consolidations of a dozen cooperatives into a single cooperative taking place. Although BC officials were fairly proactive in encouraging mergers, they recognized that the consolidation among local grain cooperatives was also driven by a number of other factors, including access to rail lines, the export market, government storage programs, and the weather. For instance, severe drought in some areas forced some local grain elevators to come together into more economically viable units. St. Paul BC officials point to the fact that most of these facilities are presently in cooperative hands and have remained within the BC system as a mark of their success in facilitating this transition.

These are but two examples of the Banks for Cooperatives using information gained from their dominant lending position to influence borrower decisions and thus the match of capacity and demand in particular industries. However, the banks are only able to accomplish this under certain circumstances. The factors which facilitate and inhibit investment coordination by the BCs are discussed in turn in the next two sections.

7.3.2. Factors Facilitating Investment Coordination by the BCs

There are two broad factors which facilitate the BCs' role in coordinating investments: their market share and the closeness of their relationships with their borrowers.

The most important factor facilitating investment coordination is the BCs' share of the cooperative credit market, the determinants of which were discussed in the last chapter. BC officials reported that their greatest market share, and thus their greatest potential for coordinating investments, is with local grain and farm supply cooperatives. They subjectively estimated their market share among these firms to be about 80 percent,

only slightly higher than the figure obtained in the survey of the 290 largest cooperatives (see Table 6.8).

Maintaining lending relationships with a large number of the firms in an industry enables the BCs to construct a database useful for analyzing various ways of optimizing investments in productive capacity. During the period in which the St. Louis BC actively encouraged its borrowers to consolidate, it was lending to about 175 local farm supply and grain cooperatives across three states. All of the locals were being audited by the same firm (the Illinois Agricultural Auditing Association). A former loan officer with the St. Louis BC reported that it was exceedingly easy to set up a database of borrower financial information because, for the most part, these firms were in the same type of business and were audited by the same firm using the same reporting format to provide comparable information for each cooperative. He commented that once the database was established, the BC functioned in many ways like the finance department of a large firm with many locations. This financial coordination role was not adopted by the regional grain and farm supply cooperatives because they were dominated by people with marketing backgrounds who were more concerned with pushing the regional's products through the local outlets than with optimizing investments in the system as a whole.

This type of database is unique to the BCs. Commercial banks do not have enough concentration in any one industry to justify the investment in such a database. Credit Agricole, for example, has the opposite strategy of the BCs in agribusiness lending. They target the three strongest firms out of the 6 or 7 largest in each industry. Because they are more concerned with diversification of their loan portfolio, they have little incentive to invest in a database of borrower financial information. The BCs, on the other

hand, are limited by law to cooperative lending, so they try to maximize their market share among the market segment to which they are permitted to extend credit.

The closeness of relationships between the BC credit staff and their borrowers also gives the BCs greater influence over borrowers' decisions. Loyalty contributes to the BCs' coordinating ability. When loyalty to the BC is strong, loan officers have greater latitude to influence borrowers without worrying that they will alienate them and lose their business. Many smaller borrowers reported that they only borrow from a BC and do not even "shop around" when seeking credit.

Loyalty contributes to long-term relationships between BC loan officers and borrowers, which in turn contributes to the influence the BCs have over their borrowers. The senior credit officers mentioned numerous times during the interviews that these close, long-term relationships set some boundaries on how they deal with the borrowers and how far they are willing to go in encouraging a particular course of action. For example, if they know that two borrowers have been fiercely competing with each other for years, they probably would not risk losing their credibility by proposing a merger or joint venture, even if it made good economic sense. Their detailed understanding of the history of their borrowers, as well as the personalities and abilities of cooperative managers and board members, enables them to maximize their influence over borrower decisions without exerting so much pressure that they risk losing them, sometimes a difficult balancing act.

However, in most cases, the BC credit officers do not view the relationship with the borrower as an adversarial one. Instead, they seek to form a consensus with the borrower in situations where the opinions of the bank and the borrower regarding a particular course of action are in conflict. Some of the credit officers interviewed spoke

of the need to convince the borrower that the bank's opinion is the correct one. This is more often done through subtle techniques of persuasion than direct confrontation. One BC loan officer said that whenever a borrower would come to him with an idea that was not sound, instead of confronting the borrower, he would simply fail to respond to what he felt was an inappropriate action for the cooperative to take. He would direct the borrower's attention to other matters, and in doing so convey the impression that he did not take the idea very seriously. In most cases, the borrower would drop the issue entirely. In this way, the loan officer was able to influence the borrower's decision without risking damage to the closeness of the relationship.

This type of influence is especially common in lending to local cooperatives, which tend to be less financially sophisticated and have fewer financing alternatives available to them than their larger counterparts. One loan officer noted that BC lending differs from commercial bank lending in that BC loan officers are "more maternal" and do a lot more "hand-holding" with their borrowers.

The BCs are somewhat unique in their relationship orientation to banking, which has both positive and negative aspects. While other lenders to agribusiness may gain or lose customers fairly often based on the financing deals they are able to offer prospective borrowers, most of the BCs' borrowers are long-term customers with close personal relationships with the BC credit staff. A former BC loan officer who later worked for a major international agribusiness lender commented, "A lot of banks talk about 'relationship banking' and think they do business that way, but the BCs really do it." A negative aspect of the close relationship is that the borrowers may also pressure the banks. This is discussed in the next section.

Another unique aspect of the BCs' relationship with their borrowers which may contribute to investment coordination is the ideological commitment of the credit staff to the cooperative way of doing business. This was evident in the interviews with some of the lenders, particularly at the St. Paul Bank. Although the laws that limit BC lending to cooperatives create an incentive for the banks to be strongly committed to the health of cooperatives, some credit officers seem to have a commitment that goes beyond that. Many of them are from rural areas where their borrowers are located, and they conveyed a sense of commitment to cooperatives because they contribute to the health of these communities. An officer of the St. Paul Bank, for example, recognized that cooperatives are often very important to local economies. In many instances, they are a major employer in a community, and membership on the cooperative's board of directors may be a source of status in the community. He spoke of a cooperative as something a community should be proud of and privileged to have, and said, "Some communities don't deserve a coop because they don't support it and patronize it."

This sort of ideological commitment to the economic health of rural America may be what gave officials at the St. Louis BC the vision to recognize that if drastic actions were not taken to address excess capacity in the mid-1980s, many of their smaller borrowers might fail. Considerable vision and commitment to borrowers is required for a bank to reduce its loan portfolio by roughly half in such a short period of time, especially when other incentives were in place to continue business as usual.

7.3.3. Factors Inhibiting Investment Coordination by the BCs

There are also a number of factors which limit the influence the BCs have over their borrowers' investment decisions. First of all, the BCs face greater competition for

some groups of their borrowers than others. This competition, to the extent that it reduces BC market share, limits the ability of the BCs to coordinate investments industrywide. Second, there are other sources of discipline on cooperatives, such as regional cooperatives, competitors, and other financial institutions, which limit the influence of the BCs, particularly in situations where they are working at cross purposes. Third, BC officials' concerns regarding lender liability issues may also limit their willingness to influence borrowers' investment decisions. Finally, the cooperative nature of BC ownership (the borrowers own the banks) may also limit their coordinating ability.

Senior credit officials at the BCs reported that they face stiff competition from other lenders for certain segments of their customer base. Large customers have regional, national and international banks calling on them regularly, in addition to investment banks, insurance companies and other lending organizations. Larger cooperatives shop around more and are more price sensitive than smaller customers. They are also more likely to have relationships with other lenders in addition to the BCs.

For smaller cooperatives, local commercial banks are the BCs' main source of competition. However, locals have been increasing in size and the majority have outgrown the capacity of most small town banks to finance them. Because the credit needs of most local cooperatives would exceed the local banks' regulatory lending limits, they would have to have a correspondent relationship with a larger commercial bank. This would get more complicated, expensive and involved, so many locals simply maintain an exclusive lending relationship with a BC. Moreover, while locals are too big for the small town banks, they are too far away from the big city banks that have not been a reliable source of credit to "Main Street" businesses. This creates a niche that the BCs are easily able to fill.

Because the BCs' market share is larger and less price-sensitive among small local cooperatives, their potential for influencing borrower decisions, and thus the coordination of investments, is greater among this segment of BC borrowers. The degree of competition they face for the business of larger cooperatives reduces the BCs' potential influence over the investment decisions of these firms. However, this does not imply that their influence is nonexistant. In the survey of borrowers, many large cooperatives, which number among the largest firms in the food system, commented that they value the opinions of the BC credit staff and often seek out their advice on a wide variety of issues.

Although the BCs are an important source of discipline on the decisions of their borrowers, they are only one of many groups influencing the investment decisions of cooperative managers. BC officials acknowledged that they are an important source of discipline, but were also quick to point out that regional cooperatives, other lenders, members, and competing firms also influence investment decisions. An official at the St. Paul BC commented that when all of these groups are motivated toward the same ends, a fairly good match between capacity and demand can be achieved. However, the opposite may be true if these different influences on cooperatives are working at cross purposes.

For example, one lender commented that although regional cooperatives provide some discipline on the investments of locals, discipline takes a back seat to their desire to sell. Mid-level managers of regional cooperatives are primarily marketing-oriented people who just want to drive their product through local outlets. This lender also argued that local banks, which compete with the BCs to finance local cooperatives, lack the sophistication to monitor or discipline these firms. Therefore, at least for the smaller cooperatives, the BCs are a very important source of discipline. Because larger

cooperatives have access to many other sources of financing, the BCs less able to influence their decisions.

Lender liability concerns also inhibit BC credit officials in their efforts to influence borrower decisions, because a lender that is perceived as participating too closely in the management of a company may be held liable if the company fails. BC officials reported that, while they do try to influence borrowers' decisions, they try to do so in the form of providing information and advice, which is typical of the relationship between borrower and banker in the U.S. Liability concerns most commonly arise for lenders in cases of stressed borrowers. This is due to a number of major lawsuits in the late 1980s which resulted from borrowers failing, filing for bankruptcy, and blaming their lenders' refusal to continue to extend credit to them during their financial difficulties as the cause of their failure. In several cases banks were held liable for their borrowers' subsequent failure and were ordered to pay substantial awards to their borrowers for breach of contract.[2]

Officials at the St. Paul Bank admitted that at times they come close to telling their borrowers how to run their business, simply to protect their collateral position in stressed cases. Their ultimate lever in getting the borrower to do what they want is denial of credit, but it is only used as a last resort. Before that point, the bank will start requiring reporting of collateral positions, will have more frequent communications with the borrower regarding deviations from budget or proposed capital expenditures, and will exert more of a presence at board meetings in an effort to influence the borrower's decisions. However, bank officials are also particularly cautious about not influencing

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[2] For a more complete discussion of lender liability cases and the strategies of bankers to avoid such liability, see the Journal of Commercial Bank Lending, Special Collection on Lender Liability, Philadelphia: Robert Morris Associates, 1988.

borrowers' decisions too closely, especially in cases where a cooperative, because of its financial difficulties, no longer has the option of obtaining financing from another lender.

Finally, some observers have argued that the cooperative nature of BC ownership hinders the ability of the credit staff to impose any kind of discipline on the larger borrowers. One former BC loan officer said that the large borrowers have as much influence over BC management as BC management has over small borrowers. He then said, "Well, maybe that's an exaggeration, but the influence of large borrowers is substantial." In the interviews, BC officials appeared very concerned about giving the impression that they are eager to please their larger borrowers, and are very unlikely to restrict credit to them for any reason.

This is perhaps the downside of relationship banking, at least for purposes of investment coordination. Close relationships between banker and borrower allow banks to have greater influence over the decisions of certain borrowers, but the opposite may also be true.

The next section discusses the responses of BC officials to a hypothetical investment coordination problem. This hypothetical case is consistent with a noncooperative coordination game in which the players cannot communicate with one another and must seek a focal point solution (see Chapter 3). In such a game, an external mediator or arbitrator (the BCs) may be important in reaching a stable solution.

7.3.4. Hypothetical Case of Competing Investments

The previous two sections discussed the factors which facilitate and inhibit investment coordination by the BCs. What actually happens in a particular case depends on many things, including the lender's perception of borrowers' interdependence and

willingness to assume the role of mediator or arbitrator. In order to evaluate how proactive the BCs are in coordinating investments, BC officials were asked what they would do if two competing, long-term borrowers requested financing for similar projects when the market would only support expansion by one of them.

Officials at the different BCs gave somewhat different responses. CoBank officials responded that, first of all, they would never disclose proprietary information to one cooperative that another was considering an expansion program. They would make sure that each was evaluating the market very carefully, but if both cooperatives were committed to the project and both had the necessary financial strength, they would both get loans. Even if it knew the projects would create excess capacity and be unprofitable for both cooperatives, CoBank would make the loans, as long as the borrowers could repay their loans out of revenues from their other enterprises. A senior credit official at CoBank commented,

> I think we have some influence, but does that mean this plant gets built even though it shouldn't be? Yes, it does. Because if the borrower has the ability to finance it, and we are comfortable that we'll get repaid, the plant gets built. We'll certainly encourage dialogue and communication to the extent that we don't violate confidentiality and those types of things, but in the end, the borrower gets to make the investment decision. That's not a decision we make. The issue really becomes one of "Does it impact our ability to get repaid?" If we have doubts about that, we're going to have a major say in it because we don't think it's feasible.

If, however, the failure of the investment would threaten the cooperative's ability to survive, then they might deny the loan. However, even then, CoBank officials were reluctant to say that they would refuse to extend the credit: "Well, if we felt that it would put either or both companies in jeopardy, then we would go the extra mile to try to make sure that that was really what they wanted to do."

If both cooperatives were already aware of each other's activities, CoBank might discuss the possibility of a joint venture with them:

> If we knew in fact that both knew that they were going after the same market with basically the same expansion program, then we would not in that instance be reserved about saying, "Maybe you all ought to be talking about how you'll work that out, otherwise you're going to beat each other's brains out in the marketplace."

It is fairly common for CoBank to discuss mergers or joint ventures with borrowers, especially at the local level, because they find that most locals are fairly well-informed about their competitors' plans. When it comes to coordinating investments, however, CoBank's primary concern is whether they will get their money back. While this is consistent with protecting the value of the bank for all shareholders, they don't seem to be quite as proactive as the St. Paul Bank when it comes to influencing the decisions of their borrowers. This may reflect the fact that they do business with many more large cooperatives who are more likely to simply turn to another lender for future credit needs if CoBank is hesitant in providing financing.

Officials at the St. Paul Bank agreed that, like most bankers, their primary concern when extending credit is whether they will be repaid. They admitted that the financial strength of certain borrowers gives them options for obtaining credit that others do not have, regardless of the purposes of the loans. For example, they mentioned that factors other than economics often enter into expansion decisions, and may result in the bank financing some less desirable projects. A St. Paul official said, "There are things done in the name of hometown pride and this year's crop. If the coop has a strong enough balance sheet, then they have a little more flexibility to exercise that hometown pride." They claimed that this hypothetical situation of competing investments does not occur very often, but when it does, they are fairly proactive in suggesting the idea of a merger or

joint venture or encouraging that studies be done to investigate opportunities for collaboration.

Like CoBank, St. Paul officials commented that they would be careful not to violate the confidentiality promised to their borrowers by telling one borrower what another is planning to do. They described their role in the following way:

> We don't want to tell them anything; we just want to suggest and encourage and maybe identify what some opportunities might be and get them talking...We play much more the role of a facilitator and a mediator, maybe. I guess facilitator is a better word--providing some analysis and financial implications of a joint venture or a consolidation. It's pretty hard to mandate anything. It's not our philosophy. It's not our approach.

Although it is not on the agenda of the St. Paul BC to force mergers, the senior credit officials claimed to be very proactive "in forcing decisions to be made," i.e., not to force a borrower to choose a certain course of action, but rather to force them to face up to the need for making a decision when the situation calls for it. This particularly true with borrowers experiencing financial difficulties.

A senior credit officer at the Springfield BC claimed that this hypothetical situation does not arise for them because: 1) they have fewer borrowers (around 100) compared to St. Paul (around 500) and CoBank (around 2,100), and 2) their borrowers participate in markets in which IOFs exert a much greater influence. He gave the example of the dairy industry. Although the Northeast produces more milk than other parts of the country, cooperatives have a smaller share of the market than in other regions. Because there are more proprietary forces at work, the cooperatives served by the Springfield BC have less of a commodity orientation. He admitted that the need for coordination does exist among local farm supply and grain cooperatives, but most of these are affiliated with Agway, a large regional, which has greater influence over their decisions than the BC. For these reasons, the Springfield BC seems to have less information on

cooperatives that would be useful in coordinating investments. Of the three BCs, Springfield seems to be the least proactive in this area.

3.5. Vertical Coordination of Investments Between Farm and Cooperative

BC officials acknowledged that they do try to influence their borrowers' relationships with farmer members in the interests of improving vertical coordination between farmer and cooperative. CoBank will ask a processing or marketing cooperative to use contracts where they feel it is important for the cooperative to know in advance the quantity and quality of the product it will be handling or processing. Officials at the St. Paul BC encouraged contracting between sugarbeet growers and sugar processing cooperatives when these cooperatives were first formed in the 1970s. They believe that BC influence on sugar cooperatives in these early years contributed significantly to higher returns to growers from cooperative membership.

7.4. Cooperatives' Opinions on the Role of Lenders in Investment Coordination

Although in many ways the BCs are management-led organizations, borrowers' opinions do have some influence on their lending policies. The next two sections discuss cooperatives' opinions on the role of lenders in general in coordinating investments, as well as their opinions on the role of the BCs.

7.4.1. Opinions on the Role of Lenders in General

The cooperatives that were surveyed as part of this research were asked what role they believe lenders have played in contributing to decisions leading to industry-wide overinvestment. There was considerable disagreement among respondents regarding the

Table 7.2

Role of Lenders in Over-Investment

I.33 What role do you believe lenders have played in contributing to decisions leading to over-investment at the industry level?

Response	Frequency	Percent [1]
They were not a factor	59	35.8
They pushed loans which had little chance of contributing to profits	19	11.6
They looked at each loan independently and failed to identify the extent of aggregate industry investment	63	38.4
Lenders had inadequate industry experience to make sound decisions	52	31.7
Other	7	4.3

[1] Percentages are based on 164 valid cases. This column does not add to 100 because respondents were permitted to check more than one response.

role that lenders played in these decisions. Lenders were not considered to be a factor contributing to excess capacity according to 35.8 percent of respondents. About twelve percent thought the lenders pushed loans which had little chance of contributing to profits, while 38.4 percent of respondents thought that lenders looked at each loan independently, failing to identify the extent of aggregate industry investment. Another 31.7 percent thought that lenders had inadequate industry experience to make sound decisions, and 4.3 percent thought they played other roles in decisions leading to excess capacity. (See Table 7.2).

Those who checked "other" gave more detailed insights into the role of lenders in their particular industries. The manager of a midwestern vegetable cooperative commented, "When times were good, lenders encouraged expansion of growers to the point of overproduction. Now they are afraid to lend to what they created." The CEO of

a California vegetable cooperative responded that lenders to their industry assumed that past demand growth would continue and be satisfied only out of either Canada and the U.S. or Mexico and Chile. The CEO of this cooperative felt strongly that lenders should not attempt to influence borrowers' decisions: "Our experience with lenders is such that full understanding of how the industry works is lacking, let alone how strategic capacity changes might influence industry conditions." On the other side of the coin, however, there were cooperatives who did not feel lenders were responsible for the excess capacity problems in agribusiness industries. One commented, "You can't blame lenders for lending you money. They reacted to requests for loans from borrowers. The real issue is should the requesters have requested."

There were no significant differences in responses to this question across firms in different size categories. A breakdown of responses by commodity groups revealed that rice cooperatives unanimously agreed that lenders looked at loans independently, failing to identify aggregate industry-wide investment. Moreover, none of them felt that lenders were not a factor. A larger proportion of grain and farm supply cooperatives also felt that lenders' loan-by-loan approach to credit decisions contributed to overinvestment in the aggregate.

In the following question, cooperatives were asked to indicate to what extent lenders should attempt to influence their borrowers' investment decisions in order to avoid conditions of overcapacity. Forty-eight percent of respondents thought that the lender should advise each borrower about the aggregate effect of anticipated expansions and let the borrower decide whether to invest. Another 36.2 percent thought that banks should actively monitor market growth and changes in industry capacity and strongly discourage borrowers from undertaking investments that might contribute to industry capacity

Table 7.3		
Desired Role of Lenders in Preventing Excess Capacity		
I.34 To what extent should lenders attempt to influence their borrowers' investment decisions in order to avoid conditions of overcapacity? (choose one)		
Response	Frequency	Percent [1]
They should advise each borrower about the aggregate effect of anticipated expansions and let the borrower decide whether to invest	85	48.0
They should actively monitor market growth and changes in industry capacity and strongly discourage borrowers from undertaking investments that would have significant risks due to industry capacity problems	64	36.2
They should deny loans that would lead overcapacity	17	9.6
They should do nothing	11	6.2
[1] Percentages based on 177 valid cases.		

problems. About 10 percent of respondents believed that lenders should deny loans that would lead to overcapacity, and only 6.2 percent thought that banks should do nothing to avoid excess capacity. (See Table 7.3). The vast majority of respondents (93.8 percent) believe that banks at a minimum have a responsibility to monitor the capacity-demand match in the industries they lend to.

When respondents are divided into size categories, their responses to this question are similar to those for the group as a whole. A breakdown of respondents by commodity group showed that specialty cooperatives more often advocate a non-interventionist role for lenders than cooperatives in more traditional areas where the BCs are major lenders. A more interventionist role was favored by farm supply and grain cooperatives.

Aside from monitoring investments and preventing overinvestment from occurring, lenders may also have a role to play in reducing undercapacity in particular industries. The cooperatives being surveyed were presented with two potential roles for lenders to play in reducing undercapacity and asked to choose which role they believed to be most appropriate. Respondents were evenly split on this issue, with 49.7 percent in favor of having banks advise borrowers of opportunities for profitable investments in industries short of capacity, and 50.3 percent in favor of having banks leave it up to their borrowers to perceive and investigate investment opportunities. (See Table 7.4).

Table 7.4

Desired Role of Lenders in Reducing Undercapacity

I.35 Which of the following do you believe is the most appropriate role for lenders to play in reducing undercapacity in particular industries?

Response	Frequency	Percent [1]
They should advise borrowers of opportunities for profitable investments in industries short of capacity	88	50.3
They should leave it up to their borrowers to perceive and investigate investment opportunities.	87	49.7

[1] Percentages based on 175 valid cases.

A similar division of answers was observed when respondents were broken down into size categories. Again, a larger proportion of specialty cooperatives advocated a passive role for banks relative to cooperatives in other commodity groups.

Cross-tabulations were also run to determine whether firms that had made unprofitable investments in the last ten years were more or less likely to want lenders to advise them of potentially profitable investment opportunities. Those who had made

unprofitable investments wanted lenders to advise them of opportunities slightly more often than those who had not made unprofitable investments.

7.4.2. Opinions on the Role of the BCs

The survey of cooperatives attempted to determine whether the BCs are perceived by potential borrowers as being different from other lenders, if so, how, and whether the BCs should play a more active role than other lenders in coordinating investments.

The majority of cooperatives responding to the survey (59.1 percent) believed that

Table 7.5

Cooperatives' Opinions on the Uniqueness of the Banks for Cooperatives

I.36 Do you believe the Banks for Cooperatives act differently than other lenders?

Response	Frequency	Percent [1]
Yes	97	59.1
No	67	40.9

[1] Percentages based on 164 valid cases.

the Banks for Cooperatives act differently than other lenders. (See Table 7.5). Very large and very small cooperatives more often reported a belief that the BCs are different from other lenders. When respondents were broken down into commodity groups, only among dairy and sugar cooperatives did the majority of respondents report that the BCs do not act differently than other lenders.

Those respondents who do believe that the BCs act differently were asked to indicate how they differ. The three most frequently cited differences were: 1) their greater awareness of conditions in agribusiness industries, 2) their greater understanding of how cooperatives are organized and operate, and 3) their willingness to work closely with

borrowers. Many respondents reported having more interaction and a higher degree of involvement with the BCs than with other lenders. However, a few respondents saw this as a drawback, claiming that the BCs want to get too involved in the management of their borrowers.

In addition, many respondents mentioned that the BCs are willing to take a few more calculated risks than other lenders. They are perceived as being "slower to go for the jugular," i.e., willing to stay involved longer than commercial banks when borrowers are experiencing difficulties. This willingness to take risks and ride out the hard times may be in part because the BCs have a better information base with which to evaluate risks. The manager of an Iowa grain and farm supply cooperative commented,

> They understand the cyclical nature of the business and therefore are generally more willing to stick with a client when times are tough. They can generally provide management/boards with more assistance because of their close association with and concentration in the industry.

A few cooperatives also commented that the BCs differ from other lenders in that they make some attempt to coordinate investments by influencing borrower decisions. The CEO of an Alabama farm supply cooperative described them as "more maternal. [They] have a big picture and try to make the various coops in the area do what CoBank thinks best, but it may not necessarily be the best for each coop!"

The cooperative ownership structure of the BCs was also cited as a major difference from other lenders, as BC management looks at the borrowers as owners of the bank, which may contribute to their willingness to work closely with borrowers. However, the cooperative structure is also viewed as a negative complication by some cooperatives. The CEO of a Texas cotton cooperative pointed out that the members of CoBank's board of directors are competitors to other customers, which puts BC management in the position of trying to balance competing interests in their credit decisions. The manager of

an Indiana farm supply cooperative argued that BC loan decisions are more politically motivated than those of other lenders, and that the BCs tend to place the needs of regional cooperatives ahead of the needs of locals.

After being asked whether the BCs do act differently, cooperatives were asked whether they should act differently than other lenders in attempting to coordinate investments in order to avoid excess capacity. The majority of respondents felt that the BCs should not act differently from other lenders to coordinate investments (57.9 percent), while 42.1 percent felt that they should play a stronger coordinating role. (See Table 7.6).

Table 7.6

Cooperatives' Opinions on the Role of the Banks for Cooperatives in Investment Coordination

I.37 Do you believe the Banks for Cooperatives should act differently than other lenders in attempting to coordinate investments in an industry to avoid unprofitable investments due to excess capacity?

Response	Frequency	Percent [1]
Yes	69	42.1
No	95	57.9

[1] Percentages based on 164 valid cases.

Smaller cooperatives more often felt that the BCs should try to coordinate investments. A breakdown of respondents by commodity groups revealed that only among grain cooperatives did the majority of respondents believe that the BCs should act differently than other lenders in attempting to coordinate investments. Rice and cotton cooperatives were evenly split on the issue, while those in other commodities preferred that the BCs do not attempt to coordinate investments.

The cooperatives that want the BCs to coordinate investments gave a number of reasons for their responses. The most commonly given reason was that the existence and success of the BCs depends on the existence and success of the cooperatives they lend to. Keeping cooperatives profitable was of paramount concern because, as several respondents pointed out, financing a member's efforts to expand in an already overbuilt industry hurts everyone eventually. In their responses to this question, cooperatives advocating a coordinating role for the BCs tended to recognize their interdependence. Many of them mentioned that the BCs are in a good position to coordinate investments because they are often on the "inside" regarding others' plans for expansion. One respondent thought that there was a role for the BCs in helping cooperative management to discourage board members from pursuing expansion for expansion's sake.

For those who advocate a stronger investment coordination role for the BCs, recognition of interdependence leads to cooperation. The manager of a midwestern dairy cooperative commented, "Cooperatives have a responsibility to cooperate with one another to the mutual benefit of their members." Other respondents focused on their membership in the cooperatively owned BCs as their reason for supporting investment coordination. The CFO of a fruit and vegetable cooperative said that the BCs should try to coordinate investments because borrowers are also shareholders, and good advice benefits both. Another respondent noted that coordination of investments protects the quality of BC loans, which is in the interest of all BC members. According to the vice-president for planning at one of the Fortune 500 cooperatives, "The success (or lack thereof) of the banks is directly related to the success of the investments made. A low success rate will result in higher interest rates and successful coops will borrow elsewhere."

Those respondents who did not feel that the BCs should coordinate investments most often attributed their opinions to the BCs' lack of expertise in industry analysis, as well as a desire to keep the BCs from interfering excessively in the management of cooperatives. The CEO of a large California cooperative commented,

> Centralized planning with financial leverage is dangerous, especially if the planner is staffed with typical bank industry specialists. The decision should be to lend or not to lend...[We] would rather see the BCs take action to protect their own capital than attempt to centrally plan capacity utilization. Can they be more effective than market forces, and what would their role mean in terms of liability--for them? With a stronger capital position lending capability may become more flexible.

The CEO of a Michigan farm supply cooperative responded,

> There is very little coordination. Overcapacity is (and can be) justified by newer and more efficient facilities so that the older, less efficient facilities are forced to shut down by the creation of excess capacity. This is not something that should be left to bankers. They are probably less informed than most businessmen involved in a particular industry.

The manager of a farm supply cooperative in Maryland wrote,

> I'm sure some consideration of competitors' capacity and likely intentions is always given by any firm considering expansion. Sometimes knowledge is incomplete and other times the wrong decision is made anyhow. However, resource allocation by outside agency, whether governmental, financial, trust, trade association, or whatever, has not demonstrated a track record superior to individual judgment.

Several respondents expressed a concern that investment coordination by the BCs would be usurping the role of cooperative management. The CEO of a nut cooperative commented, "Most lenders try to give good financial industry advice. Advice is good. Making decisions for cooperatives is not." The treasurer of a large fruit and vegetable cooperative said that the BCs should operate as any prudent bank and make sound loans, but not "conduct social or economic development."

Many of those who did not feel the BCs should act differently from other lenders in coordinating investments did acknowledge that lenders should evaluate loans based on

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all risk factors, including the risk of creating excess capacity, and advise the borrower on restructuring the project or deny the loan, if necessary. However, they want cooperative management to remain the ultimate decision maker and risk-bearer. The manager of a local grain and farm supply cooperative in North Dakota remarked, "[The BC] is only the lender, not the decision maker when a company makes plans to expand. Ultimately, if the BC's own analysis of the loan indicates risk due to overcapacity, then they should act accordingly."

However, many were skeptical of the BCs' ability to affect the overall match of capacity and demand in an industry. The CEO of a large rice cooperative noted, "I think any lender should attempt to coordinate its investments in an industry. But how do you coordinate the lenders?" Another respondent commented that the BCs do not have the overall perspective on industries, just the cooperative piece. The effects of foreign country investment and international trade on the profitability of U.S. cooperatives' investments was also mentioned as a factor beyond the control of the BCs. The CFO of a Michigan grain cooperative said, "Governmental policies in countries we compete against are a major factor in their investment decisions."

Although many cooperatives were wary of the BCs interfering excessively in their investment decisions and preferred for them to remain in a strictly advisory role, one respondent called for equity investment by the BCs in their borrowers. In this situation, the banks would have an ownership stake in their borrowers, as well as the borrowers having an ownership stake in the BCs. The CEO of one of the largest farm supply cooperatives in the country wrote,

> The cooperative banking system has made great strides in serving customers since the organization of CoBank. The bank is responsive and responsible. Its programs and services are competitive, if not superior. As a low profit industry, however, we are increasingly dependent on debt

> financing. We need some way--with the help and involvement of CoBank--to raise equity capital. Venture capital, in the form of equity investment, must be made available to the industry. The Bank needs (or we need it to be) more of a partner than just a lender.

To summarize, respondents who did not advocate investment coordination by the BCs tended to see their own firms as autonomous units and to resent the loss of control they feared would occur with a lender trying to influence their investment decisions. As one respondent put it, "Business is business. Banking is banking...Dictation should be given to a secretary, not to a business." On the other hand, respondents who favored investment coordination by the BCs tended to focus on their interdependence, both as industry participants and as shareholders of a commonly owned bank. Their response to their perceived interdependence is to look for ways to cooperate for mutual benefit.

7.5. Conclusions

There are many factors which contribute to the ability of the BCs to influence borrowers' investment decisions. The BCs have considerable influence over small local farm supply and grain cooperatives, and in the majority of cases have an exclusive lending relationship with them. The BCs maintain extensive databases of financial information on their borrowers and are able to monitor the effects of incremental expansions on their customers' profit margins. This is a marked contrast to the situation in commercial banks, which do not have enough of a market share in any one industry to justify investment in such a database. In some parts of the country, the BCs have played a very active role in initiating mergers and joint ventures among their borrowers based on their analysis of borrower financial data. This is a much more proactive role in influencing industry capacity than would ever be taken by commercial banks. The BCs' ability to influence the investment decisions of larger cooperatives is much more limited than with smaller

cooperatives, because the larger ones have access to many alternative sources of credit. Even among large borrowers, however, the BCs influence investment decisions by virtue of the vast amount of industry information they have access to, which is often conveyed to borrowers in the process of analyzing a loan application.

Although the BCs clearly are capable of influencing the match of capacity and demand in some of the industries and markets their customers participate in, it is questionable whether borrowers find it desirable for the BCs to play a coordinating role. The majority of cooperatives responding to the survey preferred that the BCs do not assume an active coordinating role, although they do seem to expect the banks to inform them of potential problems that might arise with an investment. The majority of cooperatives want the BCs to serve them in an advisory role, but not to dictate to them what they should do. Given the importance of a high market share to their ability to affect the capacity-demand match in particular industries, it is important for the BCs to try to keep their customers happy while using "moral suasion" to influence borrowers' decisions. Alternative policies for improving the coordination of investments in cooperative-dominated industries are examined in the next chapter.

Chapter 8

CONCLUSIONS AND POLICY RECOMMENDATIONS

This final chapter will summarize the research findings regarding the extent of the investment coordination problem among cooperatives, as well as the extent to which the BCs are able to successfully deal with the problem. Two proposals for improving the investment coordination performance of the BCs are examined, and conclusions are drawn about the banks' potential coordinating role.

8.1 The Extent of Investment Coordination Failure Among Cooperatives

This research project was prompted by the financial difficulties and excess capacity experienced by many cooperatives in the last decade. It is clear that the cooperative system, as well as the food marketing system as a whole, is in a period of transition. What is less clear is the role of the Banks for Cooperatives, the common lending institution of cooperatives, in facilitating this transition. This research examined a particular dimension of economic performance, investment coordination, and explored the relationship between the credit decisions of the BCs and the coordination of investments.

Investment coordination, or the matching of the capacity to produce a good with the long-run demand for it, is accomplished by a mix of institutions including markets for goods and services, as well as bond and equity markets and financial institutions. The presence of severe and persistent excess capacity is an indication that some part of this system of coordinating institutions has failed for a particular industry.

This research disclosed that considerable excess capacity exists in many parts of the cooperative system, particularly in grain storage, feed manufacturing, fertilizer mixing and application, farm input retailing, and many other lines of business. Over a fourth of the cooperatives surveyed which are engaged in the assembly and handling of member products, a traditional economic role for cooperatives, were operating at less than half of their capacity. However, conditions of excess capacity are less severe now than in the mid-1980s, when cooperatives experienced their most serious financial stress since the Great Depression. Excess capacity has declined over the last few years as cooperatives, with the assistance of the Banks for Cooperatives, have restructured to adapt to changing market conditions.

Excess capacity has as its root cause mistaken investment decisions. Investment decisions are the most analytically complex decisions made by firms, and the decisions are made under the greatest uncertainty. Firms may undertake investments based on mistaken expectations about future demand, or based on mistaken expectations about the investments of competitors. Although cooperatives rely on common sources of information, such as customers, in forming their expectations about future demand and the response of competitors, they lack the stock market-based signals that are available to investor-owned firms. For this reason, the research hypothesized that the BCs assume an added importance as a coordinating institution.

In addition to the lack of a secondary market for cooperative stock to provide information useful in investment decisions, the industries in which farmer cooperatives have a strong presence face a number of impediments to successful investment coordination. The firms in these industries are primarily commodity businesses in low value-added and low differentiation markets, facing unstable demand and prices. They have little brand differentiation to insulate them from the effects of competitors' investment decisions. Many of these firms face significant barriers to exit, particularly the loss of immobile assets. For example, it is not easy to sell a grain elevator when the local market will not support it. Because cooperatives are closely tied to farm production, their markets often have a strong spatial dimension. Therefore, coordination of investments takes on added importance as an efficient distribution system is needed to transport bulky commodities in a cost-effective manner.

The beliefs of industry participants also inhibit successful investment coordination. Many cooperative members believe that competition among cooperatives is desirable and maintain membership in more than one cooperative, leading to redundant capacity from the point of view of the cooperative system as a whole. In addition, the biases of many cooperative managers toward "providing a home" for whatever farmer members produce may encourage overinvestment to accommodate farm-level production. A lack of sophistication in financial analysis also is a factor leading cooperatives to make mistaken investments.

The conditions do not exist in agribusiness industries to facilitate an efficient adjustment of industry capacity. These industries are very dynamic, with changes in government policies and export demand causing major changes in the size of markets for both agricultural inputs and products. In such an environment, the BCs could be and in

some cases are an important institution for effectively using borrower information to coordinate investments and thus the performance of some of the industries they lend to.

8.2. The Extent To Which the BCs Address the Problem of Investment Coordination

This study addressed three separate but related questions: 1) Can the BCs coordinate investments? 2) Do the BCs coordinate investments? and 3) Should the BCs coordinate investments?

This research hypothesized that the Banks for Cooperatives, by virtue of their dominant lending position, would be able to assess overall market demand for a product and match productive capacity with demand by influencing the investment decisions of borrowers. In order for the banks to play this coordinating role, they must first have a large share of the credit market for farmer cooperatives, and second, cooperatives must in turn have a large market share relative to investor-owned firms in the industry. If these two conditions are met, the BCs will have access to the investment plans of many firms in an industry. This creates the information base necessary for the banks to have an impact on investment coordination.

These two conditions, while necessary for the BCs to coordinate investments, are not sufficient for them to do so. The banks must also be organized to effectively use the information obtained from borrower accounts in their credit decisions. In addition, they must have enough credibility with their borrowers to influence their decisions regarding whether to undertake investments.

The survey of cooperatives eligible to borrow from the BCs, as well as interviews with the senior credit staff, revealed that the BCs' greatest potential for influencing investment coordination is with local farm supply and grain cooperatives. The BCs

provide over 70 percent of the long-term debt financing used by grain and farm supply cooperatives, and these firms in turn account for a large share of their local markets.

The determinants of BC market share were examined in the survey of potential borrowers. The banks' ability to attract and retain customers was hypothesized to be a function of several factors, including the security requirements for loans, loan pricing policies, capitalization requirements, the specialized lending expertise of the credit staff, the availability of international banking services, and other factors, such as loyalty to the cooperative way of doing business.

The most important determinant of BC market share is clearly the loan price relative to that of competitors. Beyond that, the banks' policies regarding the allocation of operating expenses and credit risk costs are the most likely to drive away customers due to perceived unfairness. On the positive side, cooperatives are drawn to the BCs by the specialized lending expertise that they offer borrowers, as well as a sense of commitment to the cooperative form of business organization.

The BCs seem to be effectively organized to make good use of all available information in their credit decisions. All three banks have electronic databases of borrower financial information which they are able to access in order to assess the financial performance of a borrower relative to its peers. These databases are unique to the BCs among agribusiness lenders and are made economically feasible only by the concentration of the banks' loan portfolios in particular industries. Reliable information on the cooperative portion of many agribusiness industries exists only by virtue of it being gathered by the BCs from their borrowers for use in credit decisions.

In many cases, the BCs have used information from their borrower databases to facilitate a more effective match between industry capacity and long-run demand in

particular markets. For example, the St. Paul BC was able to influence the consolidation of grain cooperatives into more economically viable units which optimized storage capacity and access to rail lines on a system-wide basis. In addition, by facilitating mergers to rationalize duplicative capacity, the BCs have enabled many cooperatives to avoid bankruptcy, which is probably the costliest way for industries to adjust to changing conditions.

Although the BCs have been successful in coordinating investments in some areas, they have been less successful in others. A variety of forces, including competition from other lenders, conflicting pressure from other sources of discipline on cooperatives, the banks' concern with lender liability issues, and the cooperative nature of BC ownership, have limited the banks' influence over their borrowers' investment decisions.

Competition from other lenders is keenest for the business of large, financially successful cooperatives. These firms are courted by a wide variety of lending organizations, both international and domestic, and are more price-sensitive and likely to shop around than smaller customers. The BCs have much less competition for the business of smaller cooperatives, many of whom have outgrown the capacity of local banks to serve their needs. They have much greater influence over the decisions of these firms than the larger ones with greater access to alternative sources of financing.

The BCs are but one of many sources of discipline on cooperatives. Regional cooperatives, other lenders, members, and competing firms influence investment decisions and may be motivated toward different ends than the BCs, reducing their ability to coordinate investments.

In some cases, particularly those involving stressed borrowers, BC management may be reluctant to exert a strong influence on borrowers' decisions for fear of being held

liable if the borrower experiences losses and the bank is perceived as participating too closely in the management of the firm.

The cooperative structure of BC ownership also places some limits on the extent to which BC management tries to influence borrowers' decisions. Because the borrowers own the banks, there may be a reluctance on the part of BC management to actively influence certain borrowers, particularly the larger ones. Because a few very large cooperatives make up a disproportionately large share of the BCs' loan portfolios, BC officials are less likely to influence their decisions, although several of these borrowers mentioned that they view the BCs as an important source of advice and information.

The financial status of the borrower also affects whether or not a BC will make a loan to expand capacity when they have doubts about the success of the venture. As long as a borrower has the financial depth to repay a loan even if the venture proves to be unprofitable, they will probably make the loan. In this regard, the behavior of the BCs is much like that of any other bank: getting their money back is the bottom line.

Even in instances when the banks are in a position to influence borrowers' decisions to prevent overinvestment, and are willing to do so, whether they should or not is debatable. The existence of excess capacity in many parts of the cooperative sector suggests that the BCs do have a role to play in encouraging mergers to rationalize excess capacity and trying to prevent investments that would lead to excess capacity from being undertaken. The lack of a secondary market for BC stock also points to the appropriateness of a more interventionist role for the BCs.

Although cooperatives as a group could benefit from more active investment coordination by the BCs, the majority of those responding to the survey do not feel that the BCs should be more active than any other lender in trying to coordinate investments.

Many cooperatives, failing to recognize their interdependence with others in the same line of business, view any attempts by the BCs to influence their investment decisions as undue interference.

Much of the BCs' ability to coordinate investments is thus left to the discretion of the credit staff, both to retain and to influence borrowers. Different situations may dictate very different responses. In some cases, the BCs can exert a fairly strong influence on borrowers' decisions, while in other cases, they would risk losing the borrower by attempting too strongly to influence them. The next section will consider two proposals for improving investment coordination by the BCs.

8.3. Proposals for Improving Investment Coordination by the BCs

Two proposals for improving investment coordination by the BCs are considered here. One alternative involves improving the quality and use of industry information by the BC credit staff, and the other involves the implementation of industry-based profit centers within the BCs. While the two alternatives share a common goal of improving the information flows supporting credit decisions, they differ in that the first would strengthen the role of BC management, while the second would strengthen the role of BC members.

8.3.1. Improving the Quality and Use of Industry Information by BC Management

A considerable amount of power rests in the hands of the BC credit officials. Consistent with the model of capacity expansion as a noncooperative coordination game, the BC credit staff acts as a mediator, processing large amounts of confidential information and using its position to help borrowers optimize system-wide capacity without

communicating with one another. The effectiveness of BC credit officials in conveying the appropriate information to borrowers is of critical importance in facilitating a stable expansion of capacity in industries, such as grain handling and farm input retailing, where the BCs are the dominant lender and cooperatives have a large market share.

The BCs currently have management information systems in place to support credit decision making. These databases can be readily accessed to analyze the relative financial performance of different borrowers, as well as the effects of incremental expansions of productive capacity on the financial performance of all cooperatives competing in a particular market. Although BC officials make extensive internal use of this information, they do not make it available to borrowers except in the context of a specific credit decision. More widespread and regular dissemination of this information to cooperatives would reduce the game-theoretic uncertainty in the investment decision environment, enabling them to better evaluate their own performance and the relative prospects for success of their expansion plans. This would be more appropriate for cooperatives handling commodity goods, rather than branded products.

Accomplishing this would require the banks to devote additional resources to the credit support function. It might involve hiring more people to act as industry experts, preparing periodic industry reports based on data they have gathered and analyzed concerning both investor-owned firms and cooperatives in the major agribusiness industries they lend to. This would raise operating costs for the BCs, but probably not substantially. The potential gains to borrowers from fewer investment mistakes would likely outweigh the costs, especially when they are spread over a large number of borrowers.

8.3.2. Implementation of Industry-Based Profit Centers

A second proposal for improving the investment coordination performance of the BCs involves instituting industry-based profit centers within the banks. BC costs would be allocated to the profit centers, as well as net savings generated by the loans to each major industry. The primary goal of this pooling scheme would be to improve credit risk management by better allocating the costs of credit risk to those who cause it. Pools with a larger share of an industry's participants would pay a lower credit risk premium in their loan price, because the exchange of information among pool members via the BC lending staff would presumably reduce game-theoretic uncertainty and thus the risk of investment coordination failures. Loan pricing would reflect the differences in credit risks from one pool to another. If this pricing scheme improved credit risk management, it might enable the BCs to reduce loan losses for all borrowers.

Industry-based profit centers constitute a different approach to keeping the BCs competitive than seeking economies of scale in operating costs, which the banks have done in the past to hold down loan prices. Improving risk management through industry-based pools is analogous in some ways to credit risk management in the Japanese banking system. Decision-making structures facilitating risk-reducing information flows have allowed Japanese firms to obtain bank financing on more favorable terms and function with higher levels of debt than their U.S. counterparts.

Instituting changes in BC operations to improve accountability for credit risk might have a cumulative effect on the BCs' market share and thus their ability to coordinate investments in the future. If better information and control mechanisms were possible under a system of industry-based profit centers, risk costs might be lowered, loan prices

reduced, BC competitiveness enhanced, BC market share increased, coordination ability improved, risk costs lowered, etc.

An important aspect of how industry-based profit centers might operate concerns the degree of direct borrower involvement in decisions. At one extreme, borrowers could simply agree on the rules regarding how the costs and benefits of this pooling scheme would be allocated among pool members and let BC management do the rest, i.e., undertake independent credit analysis and loan decision making, including loan pricing. At the other extreme, borrowers could be directly involved in the allocation of investment opportunities. This could result in a greater number of joint ventures or other forms of cooperation among cooperatives. However, the greater the extent of borrower involvement in decision making, the greater the potential for direct conflict among pool members.

Borrowers might influence loan decision making in a more indirect fashion if the profit centers would function like the bank-sponsored "Presidents' Clubs" in the Japanese system. Members of the profit centers could have periodic meetings to exchange information relevant for strategic planning and to make bank management more aware of the long-range plans of industry participants. Participation would be voluntary, and the disclosure of information to other borrowers would be designed to reduce credit risk and thus loan prices for the entire pool. However, something like a Presidents' Club is already in existence. In meetings of the National Council of Farmer Cooperatives, considerable sharing of corporate strategies takes place among the 50 or so largest cooperatives. A long history of affiliation and trust makes such openness possible.

The idea of industry-based profit centers was raised in the survey of cooperatives eligible to borrow from the BCs. There was no strong agreement among cooperatives

regarding whether the BCs should adopt industry-based profit centers. Slightly more were opposed to the idea than were in favor, with no significant differences in response across size categories. (See Tables 6.26 and 6.27). This may indicate that cooperative managers do not have the time, expertise or inclination to be highly involved, so the profit centers, if implemented, would probably be led by a few making decisions for many.

BC managers, however, were fairly strongly opposed to the idea as it would reduce their power vis-a-vis borrowers. They gave a number of reasons for their position. Frequently mentioned was the fact that distributing BC profits on an industry basis runs counter to the rationale behind the 1989 BC consolidation. A major goal of the consolidation was to reduce geographical influences, such as weather or industry concentration, on the profits of the individual BCs. A CoBank official said,

> ...what we found in a couple of our banks was that customers in any given year could be fairly adversely impacted by localized weather conditions or localized troubles in a commodity group that the bank financed, and basically, by going to the CoBank operation, we are able to blend that together and mitigate for all customers any real travesty that happens anywhere in the United States. And our customers have felt good about that.

The implementation of industry-based profit centers would put the equity capital of individual borrowers at greater risk, and might make borrowers in some industries reluctant to put up the equity capital required to take out a BC loan, eventually eroding BC market share in those commodities where their market share is already small and further concentrating their loan portfolio.

BC officials also cited the accounting and management difficulties posed by multiple pools as a reason for opposing industry-based profit centers. A senior member of the CoBank credit staff commented,

> We came into CoBank operating each of the district banks as a separate pool for the last three years. That has been a big headache, a big

> headache. It is very difficult to manage pools of earnings. I know of no one in this office who would like to go back to that. It would involve tremendous accounting and management headaches, and communications with every group of borrowers about what you are doing and why. Now we can send a letter to all borrowers explaining our earnings and patronage results and how it was calculated and why, but when you have pools, it is a different communication with every group of borrowers.

The fact that most cooperatives deal with multiple enterprises and commodities was another factor cited by BC managers as a reason for their opposition to industry-based profit centers. Individual borrowers might have loans that the BC would have to allocate to different pools for purposes of accounting for member returns. This would likely make it difficult for members to anticipate their likely patronage rebate when taking out a loan. Also, for some loans, it would be difficult to link the use of the loan to a particular commodity or enterprise. As one CoBank official put it, "The juice simply isn't worth the squeeze."

BC officials said that they already consider industry-specific factors when pricing for credit risk, in addition to firm-specific risk factors. The loan pricing scheme proposed as part of the industry-based profit centers would reduce the flexibility of BC management in pricing loans to meet the competition, which might lead to some loss in market share, particularly among larger cooperatives. Moreover, BC loan quality is high, so the increased returns possible from effectively implemented industry-based profit centers would not likely result in a large enough change in loan prices to have much of an incentive effect on borrowers' financing decisions.

Also, a fear of antitrust enforcement might deter borrowers from wanting to adopt industry-based profit centers, particularly if they were structured to encourage significant borrower participation in decision making. For example, marketing cooperatives that have a dominant market share as well as closed membership or contracts with members limiting

the quantity of the commodity that members are permitted to sell to the cooperative may be leery of industry-based profit centers for fear that they might be charged with antitrust violations.[1]

A final argument against industry-based profit centers is that they would institutionalize cooperative managers' bias toward optimism in assessing market demand for new capacity. Imagine a BC profit center for the dairy industry with significant borrower input into decision making. Because farmers tend to be optimistic about the markets for whatever it is they are producing, they may push for their cooperative to expand to accommodate farm-level productive capacity. If each industry or commodity group had a representative on the BC board and greater power to influence loan policy, each industry would push for a larger share of the BCs' credit extension capacity to be allocated to its profit center, resulting in a politicization of the credit allocation function and likely allocative inefficiencies.

One lender said in an interview, "As a banker, you never see a proposal that doesn't work. Our job is to challenge that optimism." It is important for financial institutions to act as a check on the potential biases of other economic agents, whether they are caused by excessive optimism or the "bandwagon effect", i.e., the reluctance of managers to go against what other industry participants are doing.

Recent research on the role of the Farm Credit System in the farm debt crisis of the mid-1980s supports the idea that banks must check the optimism of market participants. Mark Carey (1990) argues that the Federal Land Banks fueled the speculative run-up in land values prior to the farm debt crisis by continuing to extend credit for land purchases when land (and thus collateral) was highly overvalued. He

[1]See, for example, the Sunkist case described in Mueller, Helmberger and Patterson, 1987.

blames the deviation of land prices from their long-run fundamental values in part on the cooperative ownership structure of the Farm Credit System, which institutionalizes the optimistic biases of farmers. Carey criticizes the cooperative ownership structure of the FCS as one which reinforces the dominant view of system participants and fails to provide adequate checks on their decision making.

8.3.3. Recommendations

Recommending actions for the BCs to take to improve investment coordination is no simple matter. The decision to expand capacity is extremely complex, and is made in an environment of great uncertainty. Moreover, each case is unique. The design of a coordinating institution consisting of simple rules altering risks and rewards is far too crude and the incentive effects far too subtle to have much of an impact on the performance outcome.

The first of the two options examined here, improving the quality and use of industry capacity information by BC management, seems to be the most fruitful policy for the BCs to pursue. Ultimately, there is no substitute for business leadership, from both BC credit officials and their borrowers. There is also no substitute for a professional ethic which calls upon business leaders to have the vision and commitment to try to see all the possible ramifications of their decisions, going beyond simple reactions to the short-run pressures of the marketplace to identify long-term strategies for mutually beneficial cooperation.

However, both the BCs and their borrowers operate in a very competitive environment which does not encourage cooperation between cooperatives. One BC

official commented that he has seen the level of cooperation between cooperatives decline over time.

> The ones that are well-managed and in a strong financial position, they're not interested in subsidizing their brother. And I say that's a change because historically, those who were really entrenched in traditional cooperative philosophy and principles seemed to say that, "Well, someday I may be in that boat," kind of "All for one and one for all." There is much less of that today than historically. And regional cooperatives used to say,"Well, we know we could negotiate a better rate with you, but if we do, it's going to cost our locals a bit more, so we won't be too upset by that." Very few regional cooperatives have that attitude today...All cooperatives that are well-managed and in a good financial position, they're wanting to be treated the best that they can in the marketplace. Everybody does, but these customers have a right to...based on their success. And so that's how we deal with it.

Although cooperative ideology seems to have declined from previous levels, it still exists, and BC officials are very aware that dealing with cooperatives is very different from dealing with investor-owned firms. One lender said, "Working for cooperatives is different from working for a commercial bank. I think people are more honest, out for the community rather than themselves." He also felt that the BC borrowers are very much aware of the fact that they are owners of the bank, which gives them different rights vis-a-vis bank management than they would have as borrowers of a commercial bank.

The role of BC management is of critical importance in identifying ways in which productive capacity may be optimized across the cooperative system as a whole. To the extent that cooperative ideology has declined over time, some of the gains from cooperation, such as a tighter coordination of investments, may be lost. To a large extent, cooperatives are subject to the same market forces as IOFs, and these forces may prevent them from seeing the potential gains from cooperation. It is important for BC management to play a strong leadership role in identifying where their borrowers might benefit from cooperating.

8.3.4. The Future of the BCs

When speculating about the future role of the BCs, one of the first questions that arises is whether they should exist at all. Many argue that the Farm Credit System is an inefficient provider of credit and that other institutions, like commercial banks, could adequately satisfy the financial needs of farmers and their cooperatives. However, in the case of farmer cooperatives, having a specialized lender is an important alternative mechanism for coordinating investments in the absence of a secondary market for cooperative stock. Although in many cases they do not exploit their full potential as a coordinating institution, the Banks for Cooperatives serve an important economic function in reducing the risk of failed investments in one of the most dynamic and potentially volatile segments of the food and fiber system.

The cooperative system has a recognized need for some kind of system-wide coordinating institution. In 1987, the Senate Agricultural Appropriations Subcommittee directed the Agricultural Cooperative Service to conduct a study on what cooperatives need to do to remain viable businesses. ACS enlisted the expertise of a wide range of cooperative leaders in identifying and analyzing strategies for helping cooperatives face future challenges (ACS, 1987).

One need identified in this report was for some type of institution to coordinate the resources of the existing cooperative system to allow it to compete more effectively with the extremely large and complex firms that dominate much of the food and fiber sector. The broad cooperative system designs considered included: 1) a "National Cooperative System" involving complete horizontal integration of cooperative involvement in a given commodity, coupled with vertical integration to move the product from farm to end-user in cooperative hands; 2) a "Cooperative Trading Bloc" approach, which would

organize cooperatives into geographically defined blocs dealing with all commodities and inputs common to a specific region; and 3) a "Holding Company or Cooperative Umbrella" approach, allowing cooperatives to centralize under a holding company certain functions, such as accounting and financial management, that have significant economies of scale.

In considering schemes for improving coordination among cooperatives and promoting the position of the cooperative system as a whole vis-a-vis investor-owned competitors, cooperative leaders completely ignored the existing role and potential contributions of the Banks for Cooperatives. It is hoped that this dissertation provides some analysis of how an existing set of institutions might and does coordinate the activities of hundreds of cooperatively owned firms.

What will happen to the BCs if no actions are taken to augment their coordinating role? There is clearly excess capacity in the U.S. banking industry, a situation that is likely to continue over the next several years. Until the industry consolidates, competition among lenders will continue to be fierce, with different lenders seeking specialized market niches (Duncan, 1992). The credit staff of the Banks for Cooperatives, however, expects that the BCs will stay viable into the future. They cite several reasons for the banks' expected continued success.

They anticipate being able to fill the market niche comprised of cooperatives partly because of their relationship orientation to banking. Most of their borrowers are long-term customers with strong personal relationships with the BC credit staff. Moreover, BC officials anticipate being able to continue their industry specialization, which allows them to offer meaningful advice to their borrowers. They perceive this advice to be of primary importance to their ability to maintain sound long-term relationships with their customers.

Moreover, they feel that the vast majority of their customers have a sense of ownership toward the BCs, which adds to their loyalty.

However, the long-term survival of the BCs is directly dependent on the long-term survival of their borrowers. BC officials reported that, for the most part, cooperatives have weathered the financial difficulties they faced in the 1980s. Many have rid themselves of excess capacity through mergers and joint ventures (although more remains to be done in some areas), and have improved decision making, becoming more sophisticated and market-oriented. Because cooperatives and the BCs are dependent on each other for their survival, the BCs have played a key role in their borrowers' adjustments to changing economic conditions. One lender, however, remarked that it is hard to kill a cooperative, given their advantages in sourcing inputs, taxation, and financing. As long as the BCs continue to advise cooperatives in such a way as to keep them competitive and maintain their market share relative to their investor-owned competitors, and especially if government policy remains favorable toward cooperatives, the banks will continue to exist and be profitable into the future.

However, the BC structure is likely to undergo another change. Officials at the St. Paul Bank reported that they anticipate eventually merging with CoBank. At the time of the vote regarding whether to join CoBank, St. Paul borrowers chose not to merge because the bank was operating and was projected to continue to operate more efficiently in terms of its cost structure than the merged organization. So far, it has continued to do so, but St. Paul officials recognize that certain advantages exist to consolidating operations with CoBank, once it has effectively worked out the details of its consolidation of 10 district BCs with the Central BC. St. Paul BC officials stressed that they were behind the merger and that the decision not to join at this time was not a criticism of CoBank, but

rather a question of timing. However, they were not sure whether their borrowers would decide to join CoBank in 5 years or 20 years. It is expected that eventually all three BCs will merge operations into one organization.

In addition to the potential further consolidation of the BCs, there is a growing consensus among FCS leaders that there is a need to petition Congress for an expansion of the system's authority. The CEO of CoBank is currently chairman of a group doing long-term strategic planning for the FCS. Their goal is to eventually make the case to Congress that the system needs expanded authority to respond to opportunities arising from trade liberalization as well as the shift in the rural economy away from dependence on farming. FCS leaders want the system to be allowed to finance U.S. agricultural and cooperative investments in places like Mexico and the former Soviet Union if it is to keep pace with other lenders, both domestic and international, in an environment of increased capital, labor, management, and information mobility. In their future reorganization, FCS leaders should consider how to best restructure the system to take advantage of the informational efficiencies it enjoys by virtue of its position as a dominant lender to farmers and agribusinesses.

8.4 Limitations of this Study and Suggestions for Further Research

In the first chapter of this dissertation, three coordinating mechanisms were discussed: markets, integration, and cooperatives. With regard to the coordination of investments, it seems apparent that financial markets alone are not sufficient. The complexity of investment decisions means that the information supplied by financial markets is simply too coarse to effectively guide these decisions, although it is a useful input. Cooperatives, however, lack even the signals provided by the stock market.

Administrative decisions by banks are of paramount importance in coordinating the investments in all industries, and are even more important for cooperatives.

However, investment coordination at the industry level has been virtually unexamined by the economics profession. Moreover, Robert Pindyck (1991) argues that the investment behavior of firms, industries and countries is poorly understood, which is why econometric models have had limited success in explaining and predicting changes in investment spending, particularly at the macro level. He argues that part of the problem lies in our failure to consider the irreversible nature of investment decisions (they involve substantial sunk costs) and the value to the firm of the timing of these irreversible investments. These types of strategic decisions are best explained at the firm and industry levels. The interdependence of economic agents in the decision context as well as the strategic nature of decisions suggests the use of game theory as a modelling tool.

While game-theoretic models of investment coordination have been developed in recent years, little empirical testing of them has been done. There is a great need for empirical studies of the investment coordinating process in particular industries (like the Porter and Spence study of corn wet milling), as well as comparisons across industries to isolate the effects of particular coordinating institutions (financial and otherwise) on the stability of the capacity expansion process.

This dissertation explored theoretical approaches to understanding the investment coordination problem and analyzed the effectiveness of a particular coordinating institution. However, this research has several limitations, and much work remains to be done in this area.

To begin, there is a need for effective measures of excess capacity to be developed, both at the firm level and at the industry level. Capacity can be defined as

"excess" only in relation to a certain level of demand. Given that demand is often unstable, there is some rationale for firms building capacity to meet the peak level of demand, with some of the capacity going unused in periods of lower demand. Because the stability of demand varies from industry to industry, it is difficult to define a benchmark level of capacity utilization below which capacity becomes "excess" that will allow for meaningful cross-industry comparisons.

Moreover, there is a need to distinguish between excess capacity that results from demand falling below expected levels due to unforeseen circumstances, and excess capacity that results from investments that would not have been undertaken had adequate information been available regarding the existing plans of rival firms. Only the latter case of excess capacity can be truly seen as a "coordination failure," because it is the only type of excess capacity that could have been averted by redesigning coordinating institutions to minimize the game-theoretic uncertainty in the investment decision environment. This study, however, used a somewhat looser definition, simply treating the existence of persistent excess capacity as evidence of "coordination failure."

There are three approaches to studying investment coordinating which may yield fruitful results. The first involves constructing new theoretical models to examine the investment coordination problem as both a cooperative and a noncooperative game, and drawing conclusions from these models about the likely behavior of players and resulting outcomes. Of particular interest is modelling the capacity expansion process as a cooperative game, in which communication and cooperation among players is possible given sufficient incentive to do so. This may be a useful avenue to shed light on the effectiveness of particular coordinating institutions where membership is voluntary, such as cooperatives or trade associations.

A second approach to examining investment coordination would use econometric techniques to compare the cyclicality of investments in industries in which the importance of various coordinating mechanisms differs. This type of study might build on Scherer's 1969 work measuring investment cyclicality across industries, but would include variables to capture the effects of different coordinating institutions in use in different industries. However, a potential problem with this approach, aside from the availability of data, is that investment cyclicality, while potentially suggestive of coordination failure, is not the same thing. The development of more precise ways of defining and measuring coordination failure would greatly facilitate studying the effectiveness of coordinating institutions both over time and across industries.

The third approach to examining investment coordination is to do case studies of specific industries facing growth or decline, focusing on how the responses of firms in those industries to changes in the level of investment opportunities was influenced by different financial institutions. There is a great need for research on the role of financial institions of all types in facilitating stable transitions in industry capacity. This is especially important in the context of the emerging economies of Eastern Europe and the former Soviet republics as they design new financial systems. Case studies of the role of financial institutions in industry transitions in the U.S. and other countries might provide instructive examples.

This dissertation presents an analysis of a particular institution, the Banks for Cooperatives, in coordinating the investments of agribusiness industries. It is hoped, however, that it also lays the foundation for future research into the effectiveness of a wide variety of institutions in investment coordination, a task that is fundamental to all industries and all economies.

Appendix A

List of Survey Respondents

LIST OF SURVEY RESPONDENTS

Alabama Farmers Cooperative, Inc., Decatur, AL
Elberta Farmers Cooperative, Elberta, AL
Arizona Grain Inc., Casa Grande, AZ
United Producers and Consumers Cooperative, Inc., Phoenix, AZ
SF Services, Inc., N. Little Rock, AR
Blue Anchor, Inc., Sacramento, CA
Blue Diamond Growers, Sacramento, CA
Cal/West Seeds, Woodland, CA
Calavo Growers of California, Santa Ana, CA
Calcot, Ltd., Bakersfield, CA
California Bean Growers Association, Ventura, CA
California Canning Peach Association, Lafayette, CA
California Milk Producers, Artesia, CA
California and Hawaiian Sugar Company, Concord, CA
Challenge Dairy Products, Inc., Dublin, CA
Corona-College Heights Orange and Lemon Association, Riverside, CA
Dairyman's Cooperative Creamery Association, Tulare, CA
Diamond Walnut Growers, Inc., Stockton, CA
Farmers' Rice Cooperative, Sacramento, CA
Fruit Growers Supply Company, Van Nuys, CA
Kern Delta-Weedpatch Cotton Ginning Company, Bakersfield, CA
North State Hulling Cooperative, Inc., Chico, CA
Pacific Coast Producers, Lodi, CA
Rice Growers Association of California, Sacramento, CA
San Joaquin Valley Dairymen, Los Banos, CA
Sunkist Growers, Inc., Van Nuys, CA
Sunsweet Growers Inc., Yuba City, CA
Tri Valley Growers, San Francisco, CA
Valley Fig Growers, Fresno, CA
Agland, Inc., Eaton, CO
Stratton Equity Cooperative Co., Stratton, CO
Highland-Exchange Service Cooperative (HESCO), Waverly, FL
Gold Kist, Inc., Atlanta, GA
Divaco Cooperative, Hilo, HI
Hilo Coast Processing Company, Pepeekeo, HI
Kona Farmers Cooperative, Captain Cook, HI
Bingham Cooperative, Inc., Blackfoot, ID
Dairymen's Creamery Association, Inc., Caldwell, ID
CF Industries, Inc., Long Grove, IL
ILLINI FS, Inc., Urbana, IL
Interstate Producers Livestock Association, Peoria, IL
LaSalle County Farm Supply Company, Ottawa, IL
McLean County Service Company, Bloomington, IL
Schuyler-Brown FS, Inc., Rushville, IL
Soy-Cot Sales, Inc., Des Plaines, IL

AgMax, Inc., Frankfort, IN
Countrymark Cooperative, Inc., Indianapolis, IN
Heartland Co-op, Inc., Crawfordsville, IN
Alceco-Albert City Elevator, A Cooperative, Albert City, IA
Alleman Cooperative Company, Alleman, IA
American Grain and Related Industries (AGRI Industries), Des Moines, IA
Cal-Car Service Company, Rockwell City, IA
Consolidated Cooperative, Inc., Gowrie, IA
Farmers Co-operative Company, Farnhamville, IA
Farmers Cooperative Company, Gilmore City, IA
Farmers Cooperative Elevator Company, Hornick, IA
Heart of Iowa Cooperative, Roland, IA
Mid-Iowa Cooperative, Yale, IA
NEW Cooperative, Inc., Fort Dodge, IA
Sioux Honey Association, Cooperative, Sioux City, IA
Swiss Valley Farms, Co., Davenport, IA
Waterloo Service Company, Waterloo, IA
West Bend Elevator Company, West Bend, IA
West Central Cooperative, Ralston, IA
Dodge City Cooperative Exchange, Dodge City, KS
Farmway Co-op, Inc., Beloit, KS
The Garden City Co-op, Inc., Garden City, KS
Wallace County Cooperative Equity Exchange, Sharon Springs, KS
Dairymen, Inc., Louisville, KY
Hopkinsville Elevator Co., Inc., Hopkinsville, KY
Western District Warehousing Corp., Shelbyville, KY
Gulf Dairy Association, Inc., Kentwood, LA
Maine Potato Growers, Inc., Presque Isle, ME
Thurmont Cooperative, Inc., Thurmont, MD
Greenfield Farmers Cooperative Exchange, Greenfield, MA
B & W Co-op, Inc., Breckenridge, MI
Cherry Central Cooperative, Inc., Traverse City, MI
Cooperative Elevator Co., Pigeon, MI
Farmers Petroleum Cooperative, Inc., Lansing, MI
Hamilton Farm Bureau Cooperative, Inc., Hamilton, MI
Independent Co-op Milk Producers Association, Inc., Grand Rapids, MI
Michigan Celery Promotion Cooperative, Inc., Hudsonville, MI
Michigan Live Stock Exchange, East Lansing, MI
Michigan Milk Producers Association, Novi, MI
American Crystal Sugar Company, Moorhead, MN
Central Livestock Association, Inc., South St. Paul, MN
Consolidated Cooperatives, Worthington, MN
Farmers Union Central Exchange (CENEX), St. Paul, MN
Land O'Lakes, Inc., Minneapolis, MN
Meadowland Farmers Cooperative, Lamberton, MN
Southern Minnesota Beet Sugar Cooperative, Renville, MN
St. Hilaire Cooperative Elevator, St. Hilaire, MN
Universal Cooperatives, Inc., Minneapolis, MN

Watonwan Farm Service Company, Saint James, MN
Delta Pride Catfish, Inc., Indianola, MS
Mississippi Chemical Corporation, Yazoo City, MS
Staple Cotton Cooperative Association (STAPLCOTN), Greenwood, MS
Yazoo Valley Oil Mill, Inc., Greenwood, MS
Farmland Industries, Inc., Kansas City, MO
MFA Incorporated, Columbia, MO
Mid-America Dairymen, Inc., Springfield, MO
Ray-Carroll County Grain Growers, Inc., Richmond, MO
Country Classics Dairies, Inc. (Darigold Farms), Bozeman, MT
Farmers Union Oil Company of Great Falls, Montana, Great Falls, MT
Gallatin Farmers Co., Belgrade, MT
Aurora Cooperative Elevator Company, Aurora, NE
Farmers Cooperative Company, Waverly, NE
Farmers Cooperative Elevator Company, Plymouth, NE
Farmland Service Cooperative, Gothenburg, NE
Frenchman Valley Farmers Cooperative, Imperial, NE
Frontier Cooperative Company, Brainard, NE
Heartland Co-op, Trumbull, NE
Husker Cooperative, Columbus, NE
Panhandle Cooperative Association, Scottsbluff, NE
Producers Live Stock Marketing Association, Omaha, NE
Vineland Cooperative Produce Auction Association, Inc., Vineland, NJ
Agway Inc., Syracuse, NY
Allied Federated Coops, Inc., Canton, NY
Dairylea Cooperative Inc., Syracuse, NY
Eastern Milk Producers Cooperative Association Inc., Syracuse, NY
Empire Livestock Marketing Cooperative, Syracuse, NY
National Grape Co-operative Association, Inc., Westfield, NY
Niagara Milk Cooperative, Niagara Falls, NY
O-AT-KA Milk Products Cooperative Inc., Batavia, NY
Pro-Fac Cooperative, Inc., Rochester, NY
Carolina Virginia Milk Producers Association, Inc., Charlotte, NC
Producers Cooperative Feedmill, Inc., Monroe, NC
Cass Clay Creamery, Inc., Fargo, ND
Farmers Union Elevator Company, Minot, ND
Minn-Dak Farmers Cooperative, Wahpeton, ND
Southwest Grain Cooperative, Gladstone, ND
Luckey Farmers Inc., Woodville, OH
Mercer Landmark, Inc., Celina, OH
Milk Marketing Inc., Strongsville, OH
Producers Livestock Association, Columbus, OH
Farmers Cooperative Association, Ponca City, OK
Pecan Producers, Inc., Ada, OK
Union Equity Cooperative Exchange, Enid, OK
Agripac, Inc., Salem, OR
NORPAC FOODS, INC., Stayton, OR
Tillamook County Creamery Association, Tillamook, OR

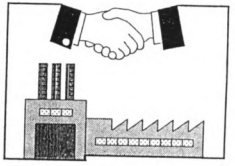
Atlantic Dairy Cooperative, Southampton, PA
Knouse Foods Cooperative Inc., Peach Glen, PA
Black Hills Milk Producers, Rapid City, SD
Eureka Equity Exchange, Eureka, SD
Farmers Co-op Oil Association, Winner, SD
South Dakota Wheat Growers Association, Aberdeen, SD
Tennessee Farmers Cooperative, La Vergne, TN
Tipton Farmers Co-op., Covington, TN
Associated Milk Producers, Inc., San Antonio, TX
NE-TEX Cooperative Oil Mill, Wolfe City, TX
Plains Cooperative Oil Mill, Inc., Lubbock, TX
Rio Grande Valley Sugar Growers, Inc., Santa Rosa, TX
Southwestern Irrigated Cotton Growers Association, El Paso, TX
Texas Cooperative Marketing Exchange, Inc., Dimmitt, TX
Valley Co-op Oil Mill, Harlingen, TX
Farmers Grain Cooperative, Ogden, UT
Intermountain Farmers Association, Salt Lake City, UT
Norbest, Inc., Midvale, UT
Western Dairymen Cooperative, Inc., Salt Lake City, UT
Cabot Farmers' Cooperative Creamery Company, Inc., Cabot, VT
Shoreham Cooperative Apple Producers Association, Inc., Shoreham, VT
St. Albans Cooperative Creamery, Inc., St. Albans, VT
Southern States Cooperative, Inc., Richmond, VA
The Valley of Virginia Co-operative Milk Producers Assn., Mount Crawford, VA
Virginia Carolina Peanut Farmers Cooperative Association, Inc., Franklin, VA
Darigold Farms, Seattle, WA
Farmers Warehouse & Commission Company, Roosevelt, WA
Ritzville Warehouse Company, Inc., Ritzville, WA
Snokist Growers, Yakima, WA
Trout Inc., Chelan, WA
Walla Walla Grain Growers, Inc., Walla Walla, WA
Wenatchee Okanogan Cooperative Federation (Wenoka Sales), Wenatchee, WA
Equity Cooperative Livestock Sales Association, Baraboo, WI
Golden Guernsey Dairy Cooperative, Milwaukee, WI
Wisconsin Dairies Cooperative, Baraboo, WI

Appendix B

Questionnaire

Cooperatives and Investment Planning

A Questionnaire



Michigan State University
1992

Cooperatives and Investment Planning

The Cooperative Investment Planning Project is designed to gather information about how cooperatives make decisions about what investments to undertake and how to finance these investments.

Your opinion is important to us. To ensure your organization's privacy, the questionnaire is identified by number only.

Please use the enclosed self-addressed envelope to return the completed questionnaire.

Thank you for your time and effort.

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Part I: Your Strategic Planning Process

All of the following questions about investment planning and financing refer to investments that would expand your firm's productive capacity, for example, construction of new plant capacity or retail facilities. The questions do not refer to investments in inventory, replacement of existing equipment, or any other type of investment that would not result in an increase in your firm's productive capacity.

INVESTMENT STRATEGY

1. To what extent does your cooperative concentrate its investments in industries that are closely related to the farming operations of your members?

   - ☐ **1. all investments are directly related to members' farming operations**
   - ☐ **2. most investments are related**
   - ☐ **3. many investments are not closely related**

2. To what extent do you agree or disagree with the following statement: It is important for a marketing cooperative to provide a "home" for all of its members' production.

   - ☐ **1. strongly agree**
   - ☐ **2. agree**
   - ☐ **3. neutral**
   - ☐ **4. disagree**
   - ☐ **5. strongly disagree**

3. To what extent do you agree or disagree with the following statement: Given an opportunity to expand capacity profitably, the best strategy is to expand immediately and on a large scale before competitors do.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

4. Have you experienced your competitors using a strategy like the one described in question 3?

- ☐ 1. yes
- ☐ 2. no

5. Has such a strategy by competitors ever caused your firm to reconsider or abandon plans for expansion?

- ☐ 1. yes
- ☐ 2. no

6. To what extent do you agree or disagree that the following statement describes your cooperative: Because the benefits of cooperative membership may only be gained through patronage of the cooperative, some members, especially those nearing retirement, have tried to prevent the cooperative from undertaking investment projects.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

INFORMATION SOURCES

7. When deciding whether to undertake capacity-expanding investments, to what extent does your firm take into account the investment plans of competitors?

- ☐ 1. competitors' expansion plans are carefully considered
- ☐ 2. competitors' plans are considered to some extent
- ☐ 3. competitors' plans are not considered at all

8. What are the most important sources that you rely on for information about your competitors' investment plans? (check all that apply)

- ☐ 1. financial press
- ☐ 2. trade associations
- ☐ 3. customers
- ☐ 4. the Banks for Cooperatives
- ☐ 5. other lenders
- ☐ 6. common suppliers of materials
- ☐ 7. common suppliers of services (auditors, law firms, etc.)
- ☐ 8. security analysts' reports
- ☐ 9. public announcements
- ☐ 10. consultants
- ☐ 11. direct contact with competitors
- ☐ 12. regional cooperatives
- ☐ 13. other:_____

9. In your opinion, how reliable are these sources of information?

	Very Reliable	Reliable	Unreliable	Don't Know
- financial press	☐	☐	☐	☐
- trade associations	☐	☐	☐	☐
- customers	☐	☐	☐	☐
- the Banks for Cooperatives	☐	☐	☐	☐
- other lenders	☐	☐	☐	☐
- common suppliers of materials	☐	☐	☐	☐
- common suppliers of services	☐	☐	☐	☐
- security analysts' reports	☐	☐	☐	☐
- public announcements	☐	☐	☐	☐
- consultants	☐	☐	☐	☐
- direct contact	☐	☐	☐	☐
- regional cooperatives	☐	☐	☐	☐
- other:_____	☐	☐	☐	☐

10. Are your firm's investment plans well-reported so that competitors could make their plans knowing what industry capacity will be?

☐ 1. yes
☐ 2. no

11. Which of the following sources does your firm rely on for information about market growth for your products? (please rank only those that apply)

____ financial press
____ trade associations
____ customers
____ the Banks for Cooperatives
____ other lenders
____ market research services
____ security analysts' reports
____ consultants
____ regional cooperatives
____ other:_____

FINANCIAL ANALYSIS

12. Which of the following does your firm use in a typical feasibility study for construction of new plant capacity or retail facilities? (please check all that apply)

☐ 1. discounting of future returns from the investment
☐ 2. assistance from outside consultants
☐ 3. multiple market growth scenarios
☐ 4. multiple scenarios regarding possible capacity expansions of competitors
☐ 5. probabilities attached to the various scenarios
☐ 6. none of the above (go to question 15)

13. If you checked number 1 in the above question, how do you choose a discount rate?

☐ 1. use the cost of a bank loan to finance the project
☐ 2. use the cost of debt issued by the cooperative to finance the project
☐ 3. use the weighted average cost of all sources of debt used to finance the project
☐ 4. use the weighted average cost of both debt and equity capital used to finance the project
☐ 5. other:_____
☐ 6. not applicable (go to question 15)

14. If the cost of equity capital is included in the discount rate, how do you determine its cost?

☐ 1. the rate of return that could be earned by the cooperative in specific alternative investments
☐ 2. the rate of return that could be earned in the member's farming operation
☐ 3. other:_____

15. Does your firm have an unallocated surplus that it can use as a source of investment financing?

- ☐ 1. yes
- ☐ 2. no

16. How difficult would it be for your cooperative to raise a substantial amount of new equity capital from members to finance an investment? (Assume you have a feasibility study showing a 15 percent rate of expected return and a lender requirement of 40 percent of the investment from new equity).

- ☐ 1. almost impossible
- ☐ 2. very difficult
- ☐ 3. somewhat difficult
- ☐ 4. fairly easy
- ☐ 5. very easy

GOVERNANCE AND DECISION MAKING

17. To what extent do you agree or disagree with the following statement: The diverse business interests of my cooperative's membership makes it difficult for members to reach a decision about which investments to undertake.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

18. Does the task of getting members to reach a decision make your cooperative less able to react to investment opportunities than your non-cooperative competitors?

- ☐ 1. yes
- ☐ 2. no

19. To what extent do you agree or disagree with the following statement: Close contact between cooperative management and members allows us to predict demand for our firm's products and services more accurately than our investor-owned competitors are able to.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

20. To what extent do the directors of your cooperative delegate investment decision making authority to management?

- ☐ 1. management does all analysis of investment projects and all decision making
- ☐ 2. management does all analysis of investment projects; board votes on their recommendation
- ☐ 3. both management and board are actively involved in the analysis of investments, board makes final decision
- ☐ 4. board and/or members are actively involved in both the analysis of investment projects and decision making
- ☐ 5. other:_____

21. Do members have to approve capacity-expanding investments undertaken by your cooperative?

- ☐ 1. yes, all expansions
- ☐ 2. yes, but only expansions larger than a certain dollar amount (specify $_____)
- ☐ 3. no

22. Does your cooperative allow non-members to sit on the board?

- ☐ 1. yes
- ☐ 2. no (if you checked no, go to question 24)

23. If you answered yes to the above question, has the presence of non-members on your board improved your firm's investment decision making?

- ☐ 1. yes
- ☐ 2. no

INVESTMENT EXPERIENCE

24. What percent of your cooperative's capacity in each of its enterprises is currently being utilized? (fill in only those that are relevant for your firm)

Line of business	Percent utilized
retailing of farm inputs	____%
manufacturing of farm inputs	____%
assembly and handling of member products	____%
processing of member products	____%
other:	
_____	____%
_____	____%

25. Investments are always made based on expectations. In the highly uncertain world, expected returns frequently don't materialize and investments may turn out to be either unprofitable or less profitable than alternative investments would have been. Moreover, often investments that would have been profitable are not made.

In the past 10 years, has your firm made any investments that have proven to be unprofitable?

- ☐ 1. yes
- ☐ 2. no (if you checked no, go to question 28)

26. What were the unexpected events that resulted in not meeting your original expectations? (check all that apply)

- ☐ 1. demand for the product was lower than expected
- ☐ 2. technological change caused obsolescence of assets
- ☐ 3. rival firms also expanded, driving down prices
- ☐ 4. internal problems (plant start-up delays, management problems, design problems, etc.)
- ☐ 5. other:_____

27. To what extent were investments undertaken by competitors an important factor resulting in failure to achieve expected returns from your investments?

- ☐ 1. very important
- ☐ 2. important
- ☐ 3. somewhat important
- ☐ 4. not important

28. Do you feel your firm missed out on any significant opportunities for profitably expanding capacity during the last 10 years?

- ☐ 1. yes
- ☐ 2. no (if you checked no, go to question 30)

29. If you answered yes to the above question, what factors prevented your firm from undertaking these investments that would have been profitable?

- ☐ 1. board rejected proposal
- ☐ 2. rejection of loan by lender
- ☐ 3. the opportunity was not generally recognized by the firm
- ☐ 4. lack of resources to put together a feasibility study
- ☐ 5. other_____

30. Are you aware of your firm's share of total industry capacity?

- ☐ 1. yes
- ☐ 2. no

31. Are you suffering from serious problems of excess capacity in any of your lines of business?

- ☐ 1. yes
- ☐ 2. no

If yes, please list them:_____

_____

32. Do you have any other examples of agribusiness industries with serious excess capacity problems? (please list the industries)

_____

_____

33. What role do you believe lenders have played in contributing to decisions leading to over-investment at the industry level? (check all that apply)

- ☐ 1. they were not a factor
- ☐ 2. they pushed loans which had little chance of contributing to profits
- ☐ 3. they looked at each loan independently and failed to identify the extent of aggregate industry investment
- ☐ 4. the lenders had inadequate industry experience to make sound decisions
- ☐ 5. other:_____

34. To what extent should lenders attempt to influence their borrowers' investment decisions in order to avoid conditions of overcapacity? (choose one)

- ☐ 1. they should advise each borrower about the aggregate effect of anticipated expansions and let the borrower decide whether to invest
- ☐ 2. they should actively monitor market growth and changes in industry capacity and strongly discourage borrowers from undertaking investments that would have significant risks due to industry capacity problems
- ☐ 3. they should deny loans that would lead to overcapacity
- ☐ 5. they should do nothing

35. Which of the following do you believe is the most appropriate role for lenders to play in reducing undercapacity in particular industries?

- ☐ 1. they should advise borrowers of opportunities for profitable investments in industries short of capacity
- ☐ 2. they should leave it up to their borrowers to perceive and investigate investment opportunities.

36. Do you believe the Banks for Cooperatives act differently than other lenders?

☐ 1. yes
☐ 2. no

If yes, how? _____

_____

37. Do you believe the Banks for Cooperatives should act differently than other lenders in attempting to coordinate investments in an industry to avoid unprofitable investments due to excess capacity?

☐ 1. yes
☐ 2. no

Why or why not?_____

_____

38. When firms do not know about the investment plans of their competitors, overexpansion can occur. Please comment on how you think investments in productive capacity are matched with long-run demand in the industries your firm participates in.

_____

_____

_____

39. Do you have any comments on the role of the Banks for Cooperatives in matching industry-wide capacity with demand?

_____

_____

_____

_____

_____

Part II: Where Your Cooperative Obtains Financing for Capacity Expansions

1. When seeking long-term credit to finance an expansion of your cooperative's productive capacity, which of these sources would you be likely to consider? (please rank those you would consider in order of importance)

____ the Banks for Cooperatives (BCs)
____ bonds, notes or debt certificates issued to members
____ commercial banks
____ insurance companies
____ capital lease obligations
____ industrial development revenue bonds
____ other (specify:_____)

2. Over the past five years, approximately what percent of your firm's long-term debt financing was obtained from each of the following sources:

Source	Percent
1. the Banks for Cooperatives (BCs)	____
2. bonds, notes or debt certificates issued to members	____
3. commercial banks	____
4. insurance companies	____
5. capital lease obligations	____
6. industrial development revenue bonds	____
7. other:_____	____
Total =	100%

3. When seeking long-term credit to finance an expansion of your firm's capacity, do you consider a joint-financing arrangement involving two or more lenders desirable?

- ☐ 1. yes
- ☐ 2. no
- ☐ 3. indifferent

If yes, why?_____

_____

SECURITY REQUIREMENTS

4. How would you rate the BCs' security requirements relative to those of other lenders?

- ☐ 1. more stringent
- ☐ 2. about the same
- ☐ 3. less stringent

5. To what extent do you agree or disagree with the following statement: The BCs' security requirements put my cooperative at a disadvantage when we seek financing from other sources because other investors are reluctant to get involved unless they have an equally secured position.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

6. To what extent do you agree or disagree with the following statement: The BCs' security requirements are a significant deterrent to borrowing from them.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

LOAN PRICING

Fixed vs. Variable Rate Products

The BCs have moved toward differentially pricing loan products in a manner similar to other lenders. Most of the term loans made by the BCs to larger borrowers are marginally priced, fixed rate loans.

7. In order to finance an expansion of your firm's capacity, which type of loan would your firm prefer to receive from a BC?

- ☐ 1. a fixed rate term loan
- ☐ 2. a variable rate term loan

8. For financing a capacity expansion, which type of loan would your cooperative be most likely to obtain from a BC?

- ☐ 1. a fixed rate term loan
- ☐ 2. a variable rate term loan

9. To what extent do you agree or disagree with the following statement: The unavailability of fixed rate term loans is a significant deterrent to borrowing from a BC.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

Differentiation Based on Transaction Size

Operating expenses are one factor that affects BC profitability in a lending relationship. These expenses arise from making and servicing loans. The costs of servicing loans to smaller borrowers are higher on a per dollar borrowed basis than the costs of servicing loans to larger borrowers.

10. To what extent do you agree or disagree with the following statement: Loan prices from the BCs should clearly differentiate between borrowers based on size and servicing costs.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

11. Has your cooperative been offered lower loan prices from other lenders that consider your firm to be a larger borrower?

- ☐ 1. yes
- ☐ 2. no

12. To what extent do you agree or disagree with the following statement: A BC policy that did not differentiate interest rates based on borrower size (or size of loans) would be a major deterrent to borrowing from them.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

13. To what extent do you agree or disagree with the following statement: It is better to use variable up-front fees to differentiate between borrowers on the basis of size or servicing costs than to include them in the interest rate.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

Differentiation Based on Credit Risk

The BCs incur costs associated with the credit risk that is inherent in lending money. These costs include actual loan losses experienced by the bank, as well as the costs of additional time spent monitoring problem loans, providing financial counseling, and liquidating loans.

14. To what extent do you agree or disagree with the following statement: The BCs should charge varying rates on loans based on the riskiness of the loan.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

15. What do you think is the most appropriate measure of risk for a BC to use when evaluating and pricing a loan? (please check only one)

- ☐ 1. a formula based on the borrower's current financial performance
- ☐ 2. a rating based on the industry the investment would be in
- ☐ 3. a formula based on both the borrower's financial performance and characteristics of the investment
- ☐ 4. analysis of individual borrowers at the bank's discretion
- ☐ 5. other: _____

16. To what extent do you agree or disagree with the following statement: If the BCs did not differentiate loan prices based on the risk characteristics of the loan, it would be a major deterrent to doing business with them.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

Distribution of Earnings

The final effective price of a loan from a BC depends on the allocation of earnings in the form of a patronage refund. The allocation method that is chosen has an impact on the effective loan price.

17. To what extent do you agree or disagree with the following statement: In order to equitably distribute earnings, the BCs should use multiple pools reflecting the varying rates of return earned by the bank on loans to different groups of borrowers.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

18. To what extent do you agree or disagree with the following statement: The use by the BCs of a single pool for allocating earnings among borrowers would be a significant deterrent to borrowing from them.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

19. One suggestion for improving the ability of the BCs to gather and use industry capacity information in their credit decisions is for them to implement industry-based pools. Under this proposed pooling scheme, borrowers would receive loan prices and patronage refunds reflecting the costs and returns to the BCs of making loans to their particular industry.

To what extent would you be in favor of the BCs adopting industry-based pools?

- ☐ 1. strongly in favor
- ☐ 2. moderately in favor
- ☐ 3. neutral
- ☐ 4. moderately opposed
- ☐ 5. strongly opposed

20. If the pools were reorganized along industry lines, would this affect your decision to borrow from a BC?

- ☐ 1. if my firm's stated interest rate on BC loans increased even slightly as a result of this new pooling scheme, my firm would not borrow from a BC.
- ☐ 2. my firm's decision to borrow from a BC would not be affected unless the stated interest rate increased significantly.
- ☐ 3. it would have no impact on my firm's decision.

21. To what extent do you agree or disagree with the following statement: The potential patronage rebate from the BC is unimportant in our decision to borrow from them.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

BC CAPITALIZATION METHODS

Borrowers from the BCs are required to purchase stock in the banks in conjunction with taking out a loan. This stock is then retired after a period of time at the discretion of the BC directors.

22. To what extent do you agree or disagree with the following statement: The fact that a borrower must purchase stock in the BCs is a major deterrant to borrowing from them.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

23. To what extent do you agree or disagree with the following statement: The level of base capital required by the BCs is a major deterrant to borrowing from them.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

24. How do you think the BCs might improve their capitalization methods, given the fact that they are a user-owned system?

_____

_____

SPECIALIZED LENDING EXPERTISE

25. To what extent do you agree or disagree with the following statement: The BCs' greater understanding of cooperative firms and the unique problems they face is an important factor in my cooperative's decision to borrow from them.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

26. To what extent do you agree or disagree with the following statement: An important factor in my firm's decision to borrow from the BCs is their greater understanding of the industries my firm is in.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

27. To what extent do you agree or disagree with the following statement: The BCs are more likely than other lenders to provide guidance in overcoming problems in raising equity capital for new investments.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

28. What types of assistance have you received from your Bank for Cooperatives? (check all that apply)

- ☐ 1. advice on preparing business plans
- ☐ 2. advice on preparing feasibility studies for investments
- ☐ 3. assistance with long-range planning
- ☐ 4. training programs on financial planning
- ☐ 5. advice on member education programs
- ☐ 6. management assistance
- ☐ 7. legislative representation regarding government policy on cooperatives
- ☐ 8. other:_____
- ☐ 9. none of the above

29. Which of these types of assistance would you like to receive more of from the Bank for Cooperatives? (check all that apply)

- ☐ 1. advice on preparing business plans
- ☐ 2. advice on preparing feasibility studies for investments
- ☐ 3. assistance with long-range planning
- ☐ 4. training programs on financial planning
- ☐ 5. advice on member education programs
- ☐ 6. management assistance
- ☐ 7. legislative representation regarding government policy on cooperatives
- ☐ 8. other:_____
- ☐ 9. none of the above

INTERNATIONAL LENDING

30. How satisfied are you with the BCs' international banking services?

- ☐ 1. very satisfied
- ☐ 2. somewhat satisfied
- ☐ 3. not satisfied
- ☐ 4. not applicable (we do no international business)

31. To what extent do you agree or disagree with the following statement: The quality of the BCs' international banking services is a major reason we have a relationship with them.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

32. Are there any international banking services that you want that are not offered by the BCs?

- ☐ 1. yes
- ☐ 2. no

If yes, please list them: _____

_____

OTHER FACTORS

33. To what extent do you agree or disagree with the following statement: An important reason why we continue to borrow from the BCs is that we believe it is important to remain loyal to a cooperative of which you are a member.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

34. To what extent do you agree or disagree with the following statement: The BCs interfere too much in the management of their borrowers.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

35. Have any of the following actions been taken by the Bank for Cooperatives that you borrow from? (check all that apply)

- ☐ 1. verbal encouragement to follow a certain course of action
- ☐ 2. verbal pressure to follow a certain course of action
- ☐ 3. adding of more restrictive loan covenants for seasonal financing to necessitate a certain course of action
- ☐ 4. threats to call in a loan if the cooperative did not follow a certain course of action
- ☐ 5. none of the above

36. To what extent do you agree or disagree with the following statement: BC interference in coop management is a major deterrent to borrowing from them.

- ☐ 1. strongly agree
- ☐ 2. agree
- ☐ 3. neutral
- ☐ 4. disagree
- ☐ 5. strongly disagree

37. Are there any important factors in your decision regarding where to obtain financing for a capacity expansion that were not mentioned? If so, please list them:

_____

_____

Part III: Respondent Characteristics

Your answers to the following questions will help us understand the differences among the cooperatives we are surveying.

1. What are the annual sales of your cooperative?

Marketing:	Farm Supply:
☐ less than $30 million	☐ less than $30 million
☐ $31 - $50 million	☐ $31 - $50 million
☐ $51 - $99 million	☐ $51 - $99 million
☐ $100 million and over	☐ $100 million and over

Total:

- ☐ less than $30 million
- ☐ $31 - $50 million
- ☐ $51 - $99 million
- ☐ $100 million and over

2. Do you do the majority of your business with:

- ☐ 1. farmers
- ☐ 2. other cooperatives

3. What is your level of borrowing from the BCs? $_____

4. How would you classify your cooperative by commodity group? (choose one)

- ☐ 1. fruits/vegetables
- ☐ 2. farm supply
- ☐ 3. dairy
- ☐ 4. grain
- ☐ 5. sugar
- ☐ 6. rice
- ☐ 7. cotton
- ☐ 8. poultry/livestock
- ☐ 9. other:_____

4. Of the three BCs, which one do you do the most business with?

- ☐ 1. CoBank
- ☐ 2. St. Paul
- ☐ 3. Springfield
- ☐ 4. no relationship with a BC

5. What is the position held by the person(s) filling out the questionnaire? (check all that apply)

- ☐ 1. CEO, president or general manager
- ☐ 2. Chief Financial Officer
- ☐ 3. other:_____

Thank you for your help with this study.

Please feel free to use this space for any additional comments.

Appendix C

Post Card and Cover Letters for Survey

MICHIGAN STATE UNIVERSITY

DEPARTMENT OF AGRICULTURAL ECONOMICS
AGRICULTURE HALL

EAST LANSING · MICHIGAN · 48824-1039

April 6, 1992

fname~ lname~
title~
cname~
street~
city~, state~ zip~

Dear salutation~ lname~:

During the 1980s, farmer cooperatives in the United States faced their most serious financial stress in 50 years, and many of them struggled to adapt to conditions of excess capacity through restructurings and joint ventures. Researchers at Michigan State University are undertaking a study of the role of the Banks for Cooperatives in investment planning. In particular, we seek a better understanding of the investment decision making process of cooperative firms, as well as factors important in their decision to seek financing from the Banks for Cooperatives. We plan to use this information to evaluate the extent to which the Banks for Cooperatives, as the dominant lending institution to the cooperative sector, can assist cooperatives in matching capacity-building investments with future demand in specific industries. The ultimate goal of the project is to improve the performance of the cooperative sector as well as the ability of the Banks for Cooperatives to serve their members.

In order to accomplish this objective, we are implementing a nationwide mail survey of 300 large and small cooperative firms. We are asking that the enclosed questionnaire be completed by the CEO of your firm, and/or the person in your firm who understands the investment decisions and constraints of the cooperative. The questionnaire should take about 45 minutes to complete. We have attempted to make it as easy as possible to complete the questionnaire, but it is an important and complicated subject requiring thoughtful answers. Your responses to this survey will provide valuable insights into a topic of great importance to farmer cooperatives.

You are assured complete confidentiality. You indicate your voluntary agreement to participate in the study by returning the enclosed questionnaire. The questionnaire has an identification number for mailing purposes only. This is so that we may check your name off the mailing list when your questionnaire is returned. Your name will never be placed on the questionnaire, nor the responses of your particular firm identified in any way. You may receive a copy of the results of this study by writing "copy of results requested" on the back of the return envelope, and printing your name and address below it. Please do not put this information on the questionnaire itself.

I would be happy to answer any questions you might have. Please write or call. My phone number is (517) 353-7894.

Thank you for your participation in this research. This is your chance to help influence the future of farmer cooperatives in the U.S.

Sincerely,

Laura M. Geis
Project Director

MSU is an Affirmative Action/Equal Opportunity Institution

Postcard Sent to All Firms In Survey Population
One Week After First Mailing

April 13, 1992

Last week a questionnaire was mailed to you seeking information on your firm's investment planning process and your opinions on the Banks for Cooperatives as a source of investment financing.

If you have already completed and returned the questionnaire to us, please accept our sincere thanks. If not, please do so today. It is important to us to receive information from cooperatives of different sizes in a wide variety of industries.

If by some chance you did not receive the questionnaire, or it got misplaced, please call me at (517) 353-7894 and I will get another one in the mail to you today.

Sincerely,

Laura M. Geis
Project Director

MICHIGAN STATE
UNIVERSITY

top~datereturned~ April 27, 1992

fname~ lname~
title~
cname~
street~
city~, state~ zip~

Dear salutation~ lname~:

About three weeks ago I wrote to you seeking information on your firm's investment planning process, as well as your opinions on the Banks for Cooperatives as a source of financing for your investments. As of today, we have not yet received your completed questionnaire.

This research has been undertaken in order to better understand the investment decision making process of cooperative firms and the factors which may lead to excess capacity in some industries.

I am writing to you again because of the importance of your response. We want to obtain information from a wide variety of cooperatives of different sizes and in different industries. The response of your firm will help us to have a representative sample of cooperatives from which to draw meaningful conclusions about investment planning and financing.

I have enclosed a replacement questionnaire in case the original has been misplaced. The questionnaire should be filled out by the CEO of the cooperative and/or the person responsible for decisions regarding the financing of your firm's investments.

Please remember that your opinions are confidential. Your name and individual responses will not be revealed. You indicate your voluntary agreement to participate in this research project by completing and returning this questionnaire.

We have attempted to make the questions applicable to a large number of firms with very different characteristics. If you feel that a particular question does not apply to your firm, feel free to add extra answer categories or explanatory notes in the margins. If you have any questions about filling out the questionnaire, please write or call. My telephone number is (517) 353-7894.

Thank you for your cooperation.

Sincerely,

Laura M. Geis
Project Director

COLLEGE OF
AGRICULTURE AND NATURAL RESOURCES

Department of Agricultural Economics
Michigan State University
Agriculture Hall
East Lansing, Michigan
48824-1039
FAX 517/336-1800

MSU is an affirmative-action equal-opportunity institution

Appendix D

List of People Interviewed

LIST OF PEOPLE INTERVIEWED

Richard S. Fenwick, Vice President and Corporate Economist, CoBank

Steven J. Montgomery, Executive Vice President and head of the Agribusiness Banking Group, CoBank

Robert E. Satrom, Senior Vice President and Manager of National Credit Services Division, CoBank

Stuart Peterson, Senior Vice President and Chief Credit Officer, St. Paul Bank for Cooperatives

Marvin Lindo, Vice President - Credit, St. Paul Bank for Cooperatives

William H. Erickson, Manager and Michigan Loan Representative, St. Paul Bank for Cooperatives

Lee Estenson, Associate Vice-President, Commercial Lending Division, St. Paul Bank for Cooperatives

Jerry Fenner, Assistant Treasurer, St. Paul Bank for Cooperatives

Thomas Espel, former loan officer, St. Paul Bank for Cooperatives

Scott Herring, Assistant Vice President, Springfield Bank for Cooperatives

Steve Phillips, President, Phillips and Associates, former loan officer with St. Louis BC and Credit Agricole

Marvin Duncan, Professor and Chair, Department of Agricultural Economics, North Dakota State University

Michael Cook, Partridge Professor of Cooperatives, University of Missouri, and former CEO, Farmland Industries

Richard E. Stahl, Senior Vice President and Joint General Manager - Chicago Branch, Long-Term Credit Bank of Japan

Appendix E

Interview Questions

Interview Questions

I. INVESTMENT COORDINATION QUESTIONS

Where do BCs have the greatest potential for investment coordination, i.e. highest market share and most influence over borrowers?

Where does the BCs' biggest competitive challenge come from in financing cooperatives' investment in fixed assets?

What are the main reasons the BCs lose borrowers to other lenders?

Which borrowers are most price-sensitive and do the most shopping for loans?

What are the main impediments to investment coordination by the BCs?

To what extent does fear of lender liability deter BCs from actively seeking to influence borrower decisions?

To what extent will the BCs intervene in or seek to influence their borrowers' decisions?

What would you do if two large, long-term borrowers approached you at the same time about doing similar projects to expand capacity, but you knew the market could only support one such investment? Does this scenario ever happen?

What would be the effect on a BCs' balance sheet and earnings of having one of its largest borrowers defect? Would you ever make a loan, knowing that it would likely lead to excess capacity, in order to preserve a long-term relationship with a major borrower?

Is it difficult for the BCs to satisfy both large and small customers? What conflicts typically arise? Are there conflicts between borrowerss in the same industry? In different industries?

Does the Board of Directors have any impact on the bank's ability to coordinate investments? Do they set targets or encourage lending in certain areas?

What do you think causes overinvestment? Herd mentality?

II. THE LOAN DECISION MAKING PROCESS

What is the loan decision making process at your bank?

Does the borrower always have a detailed feasibility study done when they approach the BC for financing a capacity expansion?

Do borrowers' feasibility studies explicitly consider various predictions of capacity expansion by competitors?

Are borrowers' feasibility studies sufficiently detailed? To what extent does the BC supplement them with its own information and analysis?

Are all decisions made by committee?

What is the composition of the committee?

What type of "market intelligence" is gathered by the BCs and used in loan decisions?

How is the gathering of this information organized in each BC?

What are the major sources that the BCs rely on in gathering "market intelligence" information?

Are borrower contacts and the monitoring of borrower accounts important sources of information on market growth and planned expansions?

How is this information transmitted to the loan committee?

How does the BC become aware of excess capacity problems in the industries it lends to? Internal review of accounts? Regulatory examinations?

For loans originating somewhere else than CoBank headquarters, how much of the analysis is done at the banking centers?

When is CoBank participation required on a loan originating in St. Paul or Springfield?

To what extent do loan officers specialize in lending to particular industries or types of customers?

III. LOAN PRICING

Which borrowers are typically unsecured?

How do you price loans? Do you explicitly consider the allocation of cost of funds, operating expenses and default costs among borrowers, or do you price based only on what competitors are charging?

Are most BC loans fixed rate?

How are operating expenses allocated among borrowers?

What is the extent of cross subsidization?

How do the BCs currently allocate net savings among borrowers? contracts with their members?

IV. CAPACITY PLANNING BY BCs

What are the goals of the National Credit Services Division?

How is it organized?

How many people work in the National Credit Services Division?

How does NCS provide input into loan decisions?

What types and sources of information does NCS rely on?

Is the industry information gathered by NCS ever made available to borrowers?

Do you perceive a need for more resources devoted to tracking industry capacity and market growth?

To what extent do you think the BCs contribute to the long-range planning of their borrowers?

V. INDUSTRY-BASED PROFIT CENTERS

What is the current policy on pooling and distributing earnings to borrowers?

Have the BCs ever considered pooling earnings on an industry basis?

If earnings were pooled on an industry basis and loan losses in each industry were charged to the industry's pool, and different pools were charged different credit risk premiums in their loan prices, do you think this could improve credit risk management in the BCs?

On what basis do the BCs price for credit risk?

Has any effort been made to link the credit risk premium to industry or market specific factors?

Do you make any attempt to distinguish between firm-specific and industry-specific sources of risk when pricing loans?

Appendix F

Contents of Credit Report

CREDIT REPORT OUTLINE

(St. Paul Bank for Cooperatives)

LOAN PROFILE

Purpose

Seasonal - Generally reviewed at least annually

Term - Maturity varies with assets and repayment ability

Loan History / Justification

Discuss seasonal loan activity

Discuss any other financing being used

Outline purpose of existing term debt

Discuss purpose, background, and general feasability of term loan request

Sources of Information

Audit Quality
- Unqualified, Qualified, Review, or Compilation
- Audit preparer and their credentials
- Grain and other inventory verification

Interim Statements
- Monthly, Quarterly, or Semi-annually
- Prepared internally or by a third party

Borrower Contacts
- Service Stops
- Board Meetings
- Bank Visits
- Other meetings or phone contact

LIQUIDITY ANALYSIS

Changes in Working Capital

Discuss major factors affecting working capital during at least the past year

Permanent Working Capital Requirements

Discussion and analysis of working capital requirements similar to the board presentation

PROJECTED CHANGES IN WORKING CAPITAL

- BASED OFF OF MANAGEMENT BUDGET
- ESTIMATED FROM GENERAL EARNINGS, FIXED ASSET, & EQUITY RETIREMENT PLANS

CREDIT CONTROL

- CREDIT POLICY
- ACCOUNTS RECEIVABLE AGING
- BAD DEBT HISTORY & VALUATION OF OLDER RECEIVABLES

INVENTORY CONTROL

- TURNOVER
- OBSOLESCENSE
- MARKET POSITION

FIXED ASSETS

- PRIOR YEAR'S EXPENDITURES
- PLANNED EXPENDITURES FOR FUTURE YEAR(S)

EQUITY RETIREMENTS

- BOARD POLICY
- PRESENT SITUATION
- PROJECTED RETIREMENTS

FINANCIAL TRENDS AND CONDITIONS

OPERATING STATEMENT

KEY TRENDS IN:

- LOCAL EARNINGS (EXCLUDES REGIONAL PATRONAGE)
- SALES ($ AND QUANTITY)
- GROSS MARGINS
- OPERATING EXPENSES
- NET INTEREST EXPENSE
- CASH FLOW

OPERATING BUDGET OR PROJECTIONS

- HOW PREPARED
- SIGNIFICANT CHANGES FROM PRESENT SITUATION
- SENSITIVITY ANALYSIS FOR VARIOUS SALES, GROSS MARGIN, AND EXPENSE LEVELS
- DETAILED DISCUSSION OF OVERALL FEASABILITY OF MAJOR BUILDING PROJECTS

BALANCE SHEET

- HISTORICAL AND PROJECTED CHANGES
- LEVERAGE
- OWNERSHIP
- UNIQUE FACTORS
- EFFECT OF CONTINGENT LIABILITIES
- VALUATION OF ASSETS
- PRO FORMA WHERE MAJOR CHANGES ARE ANTICIPATED

OTHER ITEMS

- SIGNIFICANT TRADE AREA CHARACTERISTICS
- STRUCTURAL CHANGES IN THE AREA AND THEIR EFFECT
- FACILITIES

REPAYMENT

SEASONAL

DISCUSSION OF ANTICIPATED USE OF SEASONAL FUNDS

TERM

DISCUSSION OF REPAYMENT ABILITY RELATIVE TO CASH FLOW
- LEVEL OR GRADUATED PAYMENT SCHEDULE
- MATURITY DATE
- EXPIRATION DATE

LOAN AGREEMENT CONDITIONS

EXAMINATION OF COMPLIANCE WITH PRESENT CONDITIONS

RECOMMENDED CHANGES WHICH MAY INCLUDE:
- AUDIT SPECIFICATIONS AND INTERIM FINANCIAL INFORMATION
- FIXED ASSET EXPENDITURE LIMITATION
- EQUITY RETIREMENT LIMITATION
- MARKET POSITION REPORTS
- MINIMUM WORKING CAPITAL
- BUDGETING
- COLLATERAL MONITORING

MANAGEMENT

GENERAL MANAGER
- EXPERIENCE LEVEL
- GENERAL PERFORMANCE
- RELATIONSHIP WITH THE BANK

BOARD OF DIRECTORS

INSURANCE COVERAGE

- Insurance Carrier
- Property & Liability Coverage
- Bonding

SECURITY AND COLLATERAL

Security Summary

Listing of present security filings which may include the following:

- Security interest on current assets
- Security interest including buildings on leased land
- Assignment of railroad leases
- Real estate mortgage
- Subordination, 3-Party, or other agreements

Collateral Analysis

Analysis of the net book value of secured fixed assets relative to term debt outstanding

Discussion of the adequacy of present security or the need for additional security

Exposure

Guidelines for seasonal commitments are based on
Seasonal Commitment : Effective Working Capital

- Maximum of 3:1 for grain cooperatives
- Average of 1:1 for farm supply cooperatives

Guidelines for term loans are based on
Local Net Worth : Term Debt

- Variable, depending on other factors, primarily repayment ability and feasability
- Maximum exposure of 1:1

SERVICING PLAN

How well have we met the prior year's goals?

Target issues to address with the cooperative

Outline of plan to assist in resolving problems

CONCLUSION

Short summary of major credit characteristics

RECOMMENDATIONS

Specific actions to be taken by loan committee

KEY RATIOS - FARM SUPPLY

RATIO	GUIDELINES			1983* MIS AVE.
	NO PROBLEM	NEEDS REVIEW	PROBLEM	
LIQUIDITY				
LOWPOINT ACCOUNTS RECEIVABLE MERCHANDISE SALES	BELOW 7%	7-10%	ABOVE 10%	9.4%
LOWPOINT MERCH. INVENTORIES MERCHANDISE SALES	BELOW 10%	10-13%	OVER 13%	11.7%
WORKING CAPITAL: SALES	ABOVE 15%	11-15%	BELOW 11%	10.5%
SOLVENCY				
ASSET OWNERSHIP	ABOVE 70%	50-70%	BELOW 50%	53.8%
LOCAL ASSET OWNERSHIP	ABOVE 40%	35-45%	BELOW 35%	41.8%
LOCAL NET WORTH: TERM DEBT	3.0:1	1.5-3.0:1	BELOW 1.5:1	4.6:1
EFFICIENCY				
SALARIES:GROSS RETURN	BELOW 40%	40-45%	ABOVE 45%	41.2%
SALES:NET FIXED ASSETS	ABOVE 10:1	8-10:1	BELOW 8:1	8.6:1
INT. EXP.:GROSS RETURN	BELOW 9%	9-14%	OVER 14%	9.9%
PROFITABILITY				
LOCAL NET MARGINS:SALES	OVER 4%	1.5-4.0%	BELOW 1.5%	1.2%
LOCAL NET MARGINS:LNW	ABOVE 30%	15-30%	BELOW 15%	8.9%
TERM DEBT:NET FUNDS AVAIL.	BELOW 1.0:1	1.0-2.0:1	ABOVE 2.0:1	2.0:1

*THE MIS AVERAGES REPRESENT 1983 AUDITED INFORMATION FROM 619 COOPERATIVE BORROWERS THROUGHOUT THE 7TH FARM CREDIT DISTRICT.

KEY RATIOS - GRAIN

RATIO	GUIDELINES			1983* MIS AVE.
	NO PROBLEM	NEEDS REVIEW	PROBLEM	
LIQUIDITY				
W.C.: GRAIN SALES	ABOVE 3%	1-3%	BELOW 1%	3.8%
SOLVENCY				
ASSET OWNERSHIP	ABOVE 70%	50-70%	BELOW 50%	48.1%
LOCAL ASSET OWNERSHIP	ABOVE 45%	35-45%	BELOW 35%	37.4%
LOCAL NET WORTH: TERM DEBT	ABOVE 3.0:1	1.5-3.0:1	BELOW 1.5:1	2.8:1
EFFICIENCY				
SALARY: GROSS RETURN	BELOW 30%	30-35%	ABOVE 35%	32.9%
SALES: NET FIXED ASSETS	ABOVE 10:1	8-10:1	BELOW 8:1	8.6:1
INT. EXPENSE: GROSS RETURN	BELOW 10%	10-13%	ABOVE 13%	12.6%
PROFITABILITY				
LOCAL NET MARGINS: SALES	ABOVE 2%	1-2%	BELOW 1%	1.3%
LOCAL NET MARGINS: LOCAL NET WORTH	ABOVE 30%	15-30%	BELOW 15%	11.8%
TERM DEBT: NET FUNDS AVAILABLE	BELOW 1.0:1	1.0-2.0:1	ABOVE 2.0:1	1.8/1

*THE MIS AVERAGES REPRESENTS 1983 AUDITED INFORMATION FROM 206 GRAIN COOPERATIVE BORROWERS FROM THROUGHOUT THE 7TH FARM CREDIT DISTRICT.

FINANCIAL RATIO DEFINITIONS

LIQUIDITY

Asset Ownership = Net worth divided by total assets

Local Asset Ownership = Local net worth divided by local assets (total assets minus regional cooperative investments)

Local Net Worth = Net worth minus investments in other cooperatives

EFFICIENCY

Salaries = Salaries and Benefits (all payroll related items)

Gross Return = Gross margins and operating revenues

PROFITABILITY

Net Funds Available = Net margins
+ Depreciation
- Net increase in investments
- Cash patronage refunds
- Dividends paid on stock
- Income tax

Appendix G

Crosstabulations from Chapter 4

(Question numbers refer to questionnaire in Appendix B)

I.2 by III.4

I.2	Count / Row Pct / Col Pct / Tot Pct	Fruits and vegetables 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
1 Strongly agree		9 14.8 33.3 5.1	8 13.1 23.5 4.6	28 45.9 82.4 16.0	6 9.8 22.2 3.4	1 1.6 16.7 .6	61 34.9
2 Agree		7 11.1 25.9 4.0	14 22.2 41.2 8.0	5 7.9 14.7 2.9	11 17.5 40.7 6.3	3 4.8 50.0 1.7	63 36.0
Column Total		27 15.4	34 19.4	34 19.4	27 15.4	6 3.4	175 100.0

(Continued)

I.2 by III.4

I.2	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
1 Strongly agree			2 3.3 25.0 1.1	1 1.6 10.0 .6	1 1.6 14.3 .6	5 8.2 25.0 2.9	61 34.9
2 Agree		1 1.6 50.0 .6	5 7.9 62.5 2.9	6 9.5 60.0 3.4	4 6.3 57.1 2.3	7 11.1 35.0 4.0	63 36.0
Column Total		2 1.1	8 4.6	10 5.7	7 4.0	20 11.4	175 100.0

(Continued)

I.2 by III.4

III.4 Page 3 of 6

I.2	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
	3	3	7		2		16
Neutral		18.8	43.8		12.5		9.1
		11.1	20.6		7.4		
		1.7	4.0		1.1		
	4	6	5	1	7	1	29
Disagree		20.7	17.2	3.4	24.1	3.4	16.6
		22.2	14.7	2.9	25.9	16.7	
		3.4	2.9	.6	4.0	.6	
	Column	27	34	34	27	6	175
(Continued)	Total	15.4	19.4	19.4	15.4	3.4	100.0

I.2 by III.4

III.4 Page 4 of 6

I.2	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
	3				1	3	16
Neutral					6.3	18.8	9.1
					14.3	15.0	
					.6	1.7	
	4		1	3	1	4	29
Disagree			3.4	10.3	3.4	13.8	16.6
			12.5	30.0	14.3	20.0	
			.6	1.7	.6	2.3	
	Column	2	8	10	7	20	175
(Continued)	Total	1.1	4.6	5.7	4.0	11.4	100.0

I.2 by III.4

III.4 Page 5 of 6

I.2	Count / Row Pct / Col Pct / Tot Pct	Fruits and vegetables (1)	Farm supply (2)	Dairy (3)	Grain (4)	Sugar (5)	Row Total
5 Strongly disagre		2			1	1	6
		33.3			16.7	16.7	3.4
		7.4			3.7	16.7	
		1.1			.6	.6	
	Column Total	27	34	34	27	6	175
		15.4	19.4	19.4	15.4	3.4	100.0

(Continued)

I.2 by III.4

III.4 Page 6 of 6

I.2	Count / Row Pct / Col Pct / Tot Pct	Rice (6)	Cotton (7)	Poultry/ livestoc (8)	Other (9)	Farm supply AND (10)	Row Total
5 Strongly disagre		1				1	6
		16.7				16.7	3.4
		50.0				5.0	
		.6				.6	
	Column Total	2	8	10	7	20	175
		1.1	4.6	5.7	4.0	11.4	100.0

Number of Missing Observations: 3

I.7 by III.4

III.4 Page 1 of 4

I.7	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
1 Competitors' exp		7	12	7	8	1	49
		14.3	24.5	14.3	16.3	2.0	27.7
		25.9	32.4	20.6	29.6	16.7	
		4.0	6.8	4.0	4.5	.6	
2 Competitors' pla		19	18	19	16	2	101
		18.8	17.8	18.8	15.8	2.0	57.1
		70.4	48.6	55.9	59.3	33.3	
		10.7	10.2	10.7	9.0	1.1	
Column Total		27	37	34	27	6	177
(Continued)		15.3	20.9	19.2	15.3	3.4	100.0

I.7 by III.4

III.4 Page 2 of 4

I.7	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
1 Competitors' exp		2	1	1	2	8	49
		4.1	2.0	2.0	4.1	16.3	27.7
		100.0	12.5	11.1	28.6	40.0	
		1.1	.6	.6	1.1	4.5	
2 Competitors' pla			7	8	3	9	101
			6.9	7.9	3.0	8.9	57.1
			87.5	88.9	42.9	45.0	
			4.0	4.5	1.7	5.1	
Column Total		2	8	9	7	20	177
(Continued)		1.1	4.5	5.1	4.0	11.3	100.0

I.7 by III.4

III.4 Page 3 of 4

I.7	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
3 Competitors' pla		1	7	8	3	3	27
		3.7	25.9	29.6	11.1	11.1	15.3
		3.7	18.9	23.5	11.1	50.0	
		.6	4.0	4.5	1.7	1.7	
	Column Total	27	37	34	27	6	177
(Continued)		15.3	20.9	19.2	15.3	3.4	100.0

I.7 by III.4

III.4 Page 4 of 4

I.7	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
3 Competitors' pla					2	3	27
					7.4	11.1	15.3
					28.6	15.0	
					1.1	1.7	
	Column Total	2	8	9	7	20	177
		1.1	4.5	5.1	4.0	11.3	100.0

Number of Missing Observations: 1

I.10 by III.4

III.4 Page 1 of 2

I.10	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
Yes	1	6 12.5 23.1 3.5	10 20.8 27.0 5.8	10 20.8 30.3 5.8	7 14.6 25.9 4.0	1 2.1 16.7 .6	48 27.7
No	2	20 16.0 76.9 11.6	27 21.6 73.0 15.6	23 18.4 69.7 13.3	20 16.0 74.1 11.6	5 4.0 83.3 2.9	125 72.3
(Continued)	Column Total	26 15.0	37 21.4	33 19.1	27 15.6	6 3.5	173 100.0

I.10 by III.4

III.4 Page 2 of 2

I.10	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
Yes	1	2 4.2 100.0 1.2	5 10.4 62.5 2.9	2 4.2 22.2 1.2	1 2.1 16.7 .6	4 8.3 21.1 2.3	48 27.7
No	2		3 2.4 37.5 1.7	7 5.6 77.8 4.0	5 4.0 83.3 2.9	15 12.0 78.9 8.7	125 72.3
	Column Total	2 1.2	8 4.6	9 5.2	6 3.5	19 11.0	173 100.0

Number of Missing Observations: 5

I.18 by III.1.3

I.18	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
Yes	1	24	13	16	24	77
		31.2	16.9	20.8	31.2	44.3
		58.5	37.1	45.7	38.1	
		13.8	7.5	9.2	13.8	
No	2	17	22	19	39	97
		17.5	22.7	19.6	40.2	55.7
		41.5	62.9	54.3	61.9	
		9.8	12.6	10.9	22.4	
	Column Total	41	35	35	63	174
		23.6	20.1	20.1	36.2	100.0

Number of Missing Observations: 4

I.19 by III.4

III.4 Page 1 of 6

I.19	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
1 Strongly agree		3	5	4	2	1	20
		15.0	25.0	20.0	10.0	5.0	11.6
		12.0	13.5	11.8	7.4	20.0	
		1.7	2.9	2.3	1.2	.6	
2 Agree		3	21	4	17		62
		4.8	33.9	6.5	27.4		35.8
		12.0	56.8	11.8	63.0		
		1.7	12.1	2.3	9.8		
Column Total		25	37	34	27	5	173
(Continued)		14.5	21.4	19.7	15.6	2.9	100.0

I.19 by III.4

III.4 Page 2 of 6

I.19	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm sup ply AND 10	Row Total
1 Strongly agree			1			4	20
			5.0			20.0	11.6
			12.5			20.0	
			.6			2.3	
2 Agree		1	5	3	1	7	62
		1.6	8.1	4.8	1.6	11.3	35.8
		50.0	62.5	33.3	16.7	35.0	
		.6	2.9	1.7	.6	4.0	
Column Total		2	8	9	6	20	173
(Continued)		1.2	4.6	5.2	3.5	11.6	100.0

I.19 by III.4

III.4 Page 3 of 6

I.19	Count / Row Pct / Col Pct / Tot Pct	Fruits and vegetables (1)	Farm supply (2)	Dairy (3)	Grain (4)	Sugar (5)	Row Total
Neutral	3	9	4	15	6	3	52
		17.3	7.7	28.8	11.5	5.8	30.1
		36.0	10.8	44.1	22.2	60.0	
		5.2	2.3	8.7	3.5	1.7	
Disagree	4	7	6	9	2		32
		21.9	18.8	28.1	6.3		18.5
		28.0	16.2	26.5	7.4		
		4.0	3.5	5.2	1.2		
(Continued)	Column Total	25	37	34	27	5	173
		14.5	21.4	19.7	15.6	2.9	100.0

I.19 by III.4

III.4 Page 4 of 6

I.19	Count / Row Pct / Col Pct / Tot Pct	Rice (6)	Cotton (7)	Poultry/ livestoc (8)	Other (9)	Farm supply AND (10)	Row Total
Neutral	3		1	4	2	8	52
			1.9	7.7	3.8	15.4	30.1
			12.5	44.4	33.3	40.0	
			.6	2.3	1.2	4.6	
Disagree	4	1	1	2	3	1	32
		3.1	3.1	6.3	9.4	3.1	18.5
		50.0	12.5	22.2	50.0	5.0	
		.6	.6	1.2	1.7	.6	
(Continued)	Column Total	2	8	9	6	20	173
		1.2	4.6	5.2	3.5	11.6	100.0

I.19 by III.4

III.4 Page 5 of 6

I.19	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
5 Strongly disagre		3	1	2		1	7
		42.9	14.3	28.6		14.3	4.0
		12.0	2.7	5.9		20.0	
		1.7	.6	1.2		.6	
	Column Total	25	37	34	27	5	173
(Continued)		14.5	21.4	19.7	15.6	2.9	100.0

I.19 by III.4

III.4 Page 6 of 6

I.19	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
5 Strongly disagre							7
							4.0
	Column Total	2	8	9	6	20	173
		1.2	4.6	5.2	3.5	11.6	100.0

Number of Missing Observations: 5

I.28 by III.1.3

III.1.3 Page 1 of 1

I.28	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
Yes	1	20	17	12	30	79
		25.3	21.5	15.2	38.0	45.1
		48.8	50.0	34.3	46.2	
		11.4	9.7	6.9	17.1	
No	2	21	17	23	35	96
		21.9	17.7	24.0	36.5	54.9
		51.2	50.0	65.7	53.8	
		12.0	9.7	13.1	20.0	
	Column Total	41	34	35	65	175
		23.4	19.4	20.0	37.1	100.0

Number of Missing Observations: 3

I.2 by I.25

I.2	Count / Row Pct / Col Pct / Tot Pct	I.25 Yes (1)	I.25 No (2)	Row Total
1 Strongly agree		27	33	60
		45.0	55.0	34.9
		28.1	43.4	
		15.7	19.2	
2 Agree		37	25	62
		59.7	40.3	36.0
		38.5	32.9	
		21.5	14.5	
	Column Total	96	76	172
		55.8	44.2	100.0

(Continued)

I.2	Count / Row Pct / Col Pct / Tot Pct	I.25 Yes (1)	I.25 No (2)	Row Total
3 Neutral		10	6	16
		62.5	37.5	9.3
		10.4	7.9	
		5.8	3.5	
4 Disagree		18	11	29
		62.1	37.9	16.9
		18.8	14.5	
		10.5	6.4	
	Column Total	96	76	172
		55.8	44.2	100.0

(Continued)

I.2	Count / Row Pct / Col Pct / Tot Pct	I.25 Yes (1)	I.25 No (2)	Row Total
5 Strongly disagre		4	1	5
		80.0	20.0	2.9
		4.2	1.3	
		2.3	.6	
	Column Total	96	76	172
		55.8	44.2	100.0

Number of Missing Observations: 6

I.2 by I.28

I.2	Count / Row Pct / Col Pct / Tot Pct	I.28 Yes (1)	I.28 No (2)	Row Total
1 Strongly agree		21	39	60
		35.0	65.0	34.7
		27.3	40.6	
		12.1	22.5	
2 Agree		26	36	62
		41.9	58.1	35.8
		33.8	37.5	
		15.0	20.8	
	Column Total	77	96	173
		44.5	55.5	100.0

(Continued)

I.2	Count / Row Pct / Col Pct / Tot Pct	I.28 Yes (1)	I.28 No (2)	Row Total
3 Neutral		11	5	16
		68.8	31.3	9.2
		14.3	5.2	
		6.4	2.9	
4 Disagree		14	15	29
		48.3	51.7	16.8
		18.2	15.6	
		8.1	8.7	
	Column Total	77	96	173
		44.5	55.5	100.0

(Continued)

I.2	Count / Row Pct / Col Pct / Tot Pct	I.28 Yes (1)	I.28 No (2)	Row Total
5 Strongly disagre		5	1	6
		83.3	16.7	3.5
		6.5	1.0	
		2.9	.6	
	Column Total	77	96	173
		44.5	55.5	100.0

Number of Missing Observations: 5

I.2 by I.31

I.2	Count / Row Pct / Col Pct / Tot Pct	I.31 Yes (1)	I.31 No (2)	Row Total
Strongly agree	1	19	42	61
		31.1	68.9	34.9
		27.9	39.3	
		10.9	24.0	
Agree	2	22	41	63
		34.9	65.1	36.0
		32.4	38.3	
		12.6	23.4	
	Column Total	68	107	175
		38.9	61.1	100.0

(Continued)

I.2	Count / Row Pct / Col Pct / Tot Pct	Yes (1)	No (2)	Row Total
Neutral	3	8	8	16
		50.0	50.0	9.1
		11.8	7.5	
		4.6	4.6	
Disagree	4	16	13	29
		55.2	44.8	16.6
		23.5	12.1	
		9.1	7.4	
	Column Total	68	107	175
		38.9	61.1	100.0

(Continued)

I.2	Count / Row Pct / Col Pct / Tot Pct	Yes (1)	No (2)	Row Total
Strongly disagre	5	3	3	6
		50.0	50.0	3.4
		4.4	2.8	
		1.7	1.7	
	Column Total	68	107	175
		38.9	61.1	100.0

Number of Missing Observations: 3

I.3 by I.25

I.3	Count / Row Pct / Col Pct / Tot Pct	I.25 Yes (1)	I.25 No (2)	Row Total
	1	8	12	20
Strongly agree		40.0	60.0	11.4
		8.3	15.2	
		4.6	6.9	
	2	54	26	80
Agree		67.5	32.5	45.7
		56.3	32.9	
		30.9	14.9	
	Column Total	96	79	175
		54.9	45.1	100.0

(Continued)

I.3	Count / Row Pct / Col Pct / Tot Pct	I.25 Yes (1)	I.25 No (2)	Row Total
	3	17	24	41
Neutral		41.5	58.5	23.4
		17.7	30.4	
		9.7	13.7	
	4	17	17	34
Disagree		50.0	50.0	19.4
		17.7	21.5	
		9.7	9.7	
	Column Total	96	79	175
		54.9	45.1	100.0

Number of Missing Observations: 3

I.7 by I.25

I.7	Count / Row Pct / Col Pct / Tot Pct	I.25 Yes (1)	I.25 No (2)	Row Total
1 Competitors' exp		30	18	48
		62.5	37.5	27.4
		31.3	22.8	
		17.1	10.3	
2 Competitors' pla		57	44	101
		56.4	43.6	57.7
		59.4	55.7	
		32.6	25.1	
Column Total		96	79	175
		54.9	45.1	100.0

(Continued)

I.7 by I.25

I.7	Count / Row Pct / Col Pct / Tot Pct	I.25 Yes (1)	I.25 No (2)	Row Total
3 Competitors' pla		9	17	26
		34.6	65.4	14.9
		9.4	21.5	
		5.1	9.7	
Column Total		96	79	175
		54.9	45.1	100.0

Number of Missing Observations: 3

I.7 by I.28

		I.28		Page 1 of 2
	Count Row Pct Col Pct Tot Pct	Yes 1	No 2	Row Total
I.7				
	1	31	18	49
Competitors' exp		63.3	36.7	27.8
		39.2	18.6	
		17.6	10.2	
	2	40	61	101
Competitors' pla		39.6	60.4	57.4
		50.6	62.9	
		22.7	34.7	
	Column	79	97	176
(Continued)	Total	44.9	55.1	100.0

I.7 by I.28

		I.28		Page 2 of 2
	Count Row Pct Col Pct Tot Pct	Yes 1	No 2	Row Total
I.7				
	3	8	18	26
Competitors' pla		30.8	69.2	14.8
		10.1	18.6	
		4.5	10.2	
	Column	79	97	176
	Total	44.9	55.1	100.0

Number of Missing Observations: 2

I.7 by I.31

I.7	Count / Row Pct / Col Pct / Tot Pct	I.31 Yes (1)	I.31 No (2)	Row Total
1 Competitors' exp		20	29	49
		40.8	59.2	27.7
		29.4	26.6	
		11.3	16.4	
2 Competitors' pla		42	59	101
		41.6	58.4	57.1
		61.8	54.1	
		23.7	33.3	
	Column Total	68	109	177
		38.4	61.6	100.0

(Continued)

I.7 by I.31

I.7	Count / Row Pct / Col Pct / Tot Pct	I.31 Yes (1)	I.31 No (2)	Row Total
3 Competitors' pla		6	21	27
		22.2	77.8	15.3
		8.8	19.3	
		3.4	11.9	
	Column Total	68	109	177
		38.4	61.6	100.0

Number of Missing Observations: 1

Appendix H

Crosstabulations from Chapter 6

(Question numbers refer to questionnaire in Appendix B)

II.5 by III.1.3

II.5	Count / Row Pct / Col Pct / Tot Pct	III.1.3: less than $30 million (1)	$31 to $50 million (2)	$51 to $99 million (3)	$100 million and (4)	Row Total
Strongly agree	1	6	3	5	8	22
		27.3	13.6	22.7	36.4	13.3
		15.4	10.0	14.7	12.9	
		3.6	1.8	3.0	4.8	
Agree	2	7	7	14	22	50
		14.0	14.0	28.0	44.0	30.3
		17.9	23.3	41.2	35.5	
		4.2	4.2	8.5	13.3	
	Column Total	39	30	34	62	165
		23.6	18.2	20.6	37.6	100.0

(Continued)

II.5 by III.1.3

II.5	Count / Row Pct / Col Pct / Tot Pct	III.1.3: less than $30 million (1)	$31 to $50 million (2)	$51 to $99 million (3)	$100 million and (4)	Row Total
Neutral	3	20	9	10	18	57
		35.1	15.8	17.5	31.6	34.5
		51.3	30.0	29.4	29.0	
		12.1	5.5	6.1	10.9	
Disagree	4	4	9	3	10	26
		15.4	34.6	11.5	38.5	15.8
		10.3	30.0	8.8	16.1	
		2.4	5.5	1.8	6.1	
	Column Total	39	30	34	62	165
		23.6	18.2	20.6	37.6	100.0

(Continued)

II.5 by III.1.3

III.1.3 Page 3 of 3

II.5	Count / Row Pct / Col Pct / Tot Pct	less tha n $30 mi 1	$31 to $ 50 milli 2	$51 to $ 99 milli 3	$100 mil lion and 4	Row Total
Strongly disagre	5	2	2	2	4	10
		20.0	20.0	20.0	40.0	6.1
		5.1	6.7	5.9	6.5	
		1.2	1.2	1.2	2.4	
	Column Total	39	30	34	62	165
		23.6	18.2	20.6	37.6	100.0

Number of Missing Observations: 13

II.6 by III.1.3

III.1.3 Page 1 of 3

II.6	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
1 Strongly agree		2	1	1	6	10
		20.0	10.0	10.0	60.0	6.1
		5.0	3.3	2.9	9.8	
		1.2	.6	.6	3.6	
2 Agree		8		8	8	24
		33.3		33.3	33.3	14.5
		20.0		23.5	13.1	
		4.8		4.8	4.8	
Column Total		40	30	34	61	165
(Continued)		24.2	18.2	20.6	37.0	100.0

II.6 by III.1.3

III.1.3 Page 2 of 3

II.6	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
3 Neutral		16	8	10	9	43
		37.2	18.6	23.3	20.9	26.1
		40.0	26.7	29.4	14.8	
		9.7	4.8	6.1	5.5	
4 Disagree		10	17	10	30	67
		14.9	25.4	14.9	44.8	40.6
		25.0	56.7	29.4	49.2	
		6.1	10.3	6.1	18.2	
Column Total		40	30	34	61	165
(Continued)		24.2	18.2	20.6	37.0	100.0

II.6 by III.1.3

II.6	III.1.3				Page 3 of 3
Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
5 Strongly disagre	4	4	5	8	21
	19.0	19.0	23.8	38.1	12.7
	10.0	13.3	14.7	13.1	
	2.4	2.4	3.0	4.8	
Column Total	40	30	34	61	165
	24.2	18.2	20.6	37.0	100.0

Number of Missing Observations: 13

II.9 by III.1.3

III.1.3 Page 1 of 3

II.9	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
1 Strongly agree		3		3	6	12
		25.0		25.0	50.0	7.1
		7.3		9.1	9.4	
		1.8		1.8	3.5	
2 Agree		10	9	6	9	34
		29.4	26.5	17.6	26.5	20.0
		24.4	28.1	18.2	14.1	
		5.9	5.3	3.5	5.3	
(Continued)	Column Total	41 24.1	32 18.8	33 19.4	64 37.6	170 100.0

II.9	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
3 Neutral		17	7	4	17	45
		37.8	15.6	8.9	37.8	26.5
		41.5	21.9	12.1	26.6	
		10.0	4.1	2.4	10.0	
4 Disagree		7	14	15	22	58
		12.1	24.1	25.9	37.9	34.1
		17.1	43.8	45.5	34.4	
		4.1	8.2	8.8	12.9	
(Continued)	Column Total	41 24.1	32 18.8	33 19.4	64 37.6	170 100.0

II.9	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
5 Strongly disagre		4	2	5	10	21
		19.0	9.5	23.8	47.6	12.4
		9.8	6.3	15.2	15.6	
		2.4	1.2	2.9	5.9	
	Column Total	41 24.1	32 18.8	33 19.4	64 37.6	170 100.0

Number of Missing Observations: 8

II.11 by III.1.3

		III.1.3				Page 1 of 1
	Count Row Pct Col Pct Tot Pct	less tha n $30 mi 1	$31 to $ 50 milli 2	$51 to $ 99 milli 3	$100 mil lion and 4	Row Total
II.11						
	1	16	10	18	35	79
Yes		20.3	12.7	22.8	44.3	46.7
		39.0	31.3	54.5	55.6	
		9.5	5.9	10.7	20.7	
	2	25	22	15	28	90
No		27.8	24.4	16.7	31.1	53.3
		61.0	68.8	45.5	44.4	
		14.8	13.0	8.9	16.6	
	Column Total	41 24.3	32 18.9	33 19.5	63 37.3	169 100.0

Number of Missing Observations: 9

II.11 by III.4

III.4 Page 1 of 2

II.11	Count / Row Pct / Col Pct / Tot Pct	Fruits and vegetables 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
Yes	1	17 21.3 65.4 10.0	17 21.3 48.6 10.0	14 17.5 45.2 8.2	9 11.3 34.6 5.3	1 1.3 16.7 .6	80 47.1
No	2	9 10.0 34.6 5.3	18 20.0 51.4 10.6	17 18.9 54.8 10.0	17 18.9 65.4 10.0	5 5.6 83.3 2.9	90 52.9
(Continued)	Column Total	26 15.3	35 20.6	31 18.2	26 15.3	6 3.5	170 100.0

II.11 by III.4

III.4 Page 2 of 2

II.11	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
Yes	1	1 1.3 50.0 .6	4 5.0 50.0 2.4	3 3.8 30.0 1.8	2 2.5 28.6 1.2	12 15.0 63.2 7.1	80 47.1
No	2	1 1.1 50.0 .6	4 4.4 50.0 2.4	7 7.8 70.0 4.1	5 5.6 71.4 2.9	7 7.8 36.8 4.1	90 52.9
	Column Total	2 1.2	8 4.7	10 5.9	7 4.1	19 11.2	170 100.0

Number of Missing Observations: 8

II.12 by III.1.3

III.1.3 Page 1 of 3

II.12	Count / Row Pct / Col Pct / Tot Pct	less than $30 mi 1	$31 to $ 50 milli 2	$51 to $ 99 milli 3	$100 million and 4	Row Total
1 Strongly agree		4	1	6	21	32
		12.5	3.1	18.8	65.6	18.7
		10.0	3.0	18.2	32.3	
		2.3	.6	3.5	12.3	
2 Agree		14	14	16	20	64
		21.9	21.9	25.0	31.3	37.4
		35.0	42.4	48.5	30.8	
		8.2	8.2	9.4	11.7	
Column Total		40	33	33	65	171
(Continued)		23.4	19.3	19.3	38.0	100.0

II.12	Count / Row Pct / Col Pct / Tot Pct	less than $30 mi 1	$31 to $ 50 milli 2	$51 to $ 99 milli 3	$100 million and 4	Row Total
3 Neutral		15	10	4	15	44
		34.1	22.7	9.1	34.1	25.7
		37.5	30.3	12.1	23.1	
		8.8	5.8	2.3	8.8	
4 Disagree		6	8	7	9	30
		20.0	26.7	23.3	30.0	17.5
		15.0	24.2	21.2	13.8	
		3.5	4.7	4.1	5.3	
Column Total		40	33	33	65	171
(Continued)		23.4	19.3	19.3	38.0	100.0

II.12	Count / Row Pct / Col Pct / Tot Pct	less than $30 mi 1	$31 to $ 50 milli 2	$51 to $ 99 milli 3	$100 million and 4	Row Total
5 Strongly disagre		1				1
		100.0				.6
		2.5				
		.6				
Column Total		40	33	33	65	171
		23.4	19.3	19.3	38.0	100.0

Number of Missing Observations: 7

II.18 by III.1.3

II.18	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
1 Strongly agree		1		1	1	3
		33.3		33.3	33.3	1.7
		2.4		2.9	1.5	
		.6		.6	.6	
2 Agree		6	1	8	8	23
		26.1	4.3	34.8	34.8	13.3
		14.6	3.0	23.5	12.3	
		3.5	.6	4.6	4.6	
	Column Total	41	33	34	65	173
(Continued)		23.7	19.1	19.7	37.6	100.0

II.18	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
3 Neutral		16	11	13	27	67
		23.9	16.4	19.4	40.3	38.7
		39.0	33.3	38.2	41.5	
		9.2	6.4	7.5	15.6	
4 Disagree		17	20	12	24	73
		23.3	27.4	16.4	32.9	42.2
		41.5	60.6	35.3	36.9	
		9.8	11.6	6.9	13.9	
	Column Total	41	33	34	65	173
(Continued)		23.7	19.1	19.7	37.6	100.0

II.18	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
5 Strongly disagre		1	1		5	7
		14.3	14.3		71.4	4.0
		2.4	3.0		7.7	
		.6	.6		2.9	
	Column Total	41	33	34	65	173
		23.7	19.1	19.7	37.6	100.0

Number of Missing Observations: 5

II.21 by III.1.3

III.1.3 Page 1 of 3

II.21	Count / Row Pct / Col Pct / Tot Pct	less tha n $30 mi 1	$31 to $ 50 milli 2	$51 to $ 99 milli 3	$100 mil lion and 4	Row Total
1 Strongly agree		2	2	1	2	7
		28.6	28.6	14.3	28.6	4.1
		4.9	6.1	3.0	3.1	
		1.2	1.2	.6	1.2	
2 Agree		14	11	7	11	43
		32.6	25.6	16.3	25.6	25.0
		34.1	33.3	21.2	16.9	
		8.1	6.4	4.1	6.4	
	Column Total	41	33	33	65	172
(Continued)		23.8	19.2	19.2	37.8	100.0

II.21	Count / Row Pct / Col Pct / Tot Pct	less tha n $30 mi 1	$31 to $ 50 milli 2	$51 to $ 99 milli 3	$100 mil lion and 4	Row Total
3 Neutral		7	4	7	10	28
		25.0	14.3	25.0	35.7	16.3
		17.1	12.1	21.2	15.4	
		4.1	2.3	4.1	5.8	
4 Disagree		17	14	12	30	73
		23.3	19.2	16.4	41.1	42.4
		41.5	42.4	36.4	46.2	
		9.9	8.1	7.0	17.4	
	Column Total	41	33	33	65	172
(Continued)		23.8	19.2	19.2	37.8	100.0

II.21	Count / Row Pct / Col Pct / Tot Pct	less tha n $30 mi 1	$31 to $ 50 milli 2	$51 to $ 99 milli 3	$100 mil lion and 4	Row Total
5 Strongly disagre		1	2	6	12	21
		4.8	9.5	28.6	57.1	12.2
		2.4	6.1	18.2	18.5	
		.6	1.2	3.5	7.0	
	Column Total	41	33	33	65	172
		23.8	19.2	19.2	37.8	100.0

Number of Missing Observations: 6

II.21 by III.4

III.4 Page 1 of 6

II.21	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
1 Strongly agree		1 14.3 3.7 .6	3 42.9 8.1 1.7	1 14.3 3.2 .6			7 4.0
2 Agree		6 13.6 22.2 3.5	13 29.5 35.1 7.5	6 13.6 19.4 3.5	7 15.9 25.9 4.0	2 4.5 33.3 1.2	44 25.4
Column Total		27 15.6	37 21.4	31 17.9	27 15.6	6 3.5	173 100.0

(Continued)

III.4 Page 2 of 6

II.21	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
1 Strongly agree						2 28.6 10.0 1.2	7 4.0
2 Agree		1 2.3 50.0 .6	1 2.3 12.5 .6	1 2.3 11.1 .6	2 4.5 33.3 1.2	5 11.4 25.0 2.9	44 25.4
Column Total		2 1.2	8 4.6	9 5.2	6 3.5	20 11.6	173 100.0

(Continued)

III.4 Page 3 of 6

II.21	Count / Row Pct / Col Pct / Tot Pct	Fruits and vegetables (1)	Farm supply (2)	Dairy (3)	Grain (4)	Sugar (5)	Row Total
3 Neutral		4	3	10	4	1	28
		14.3	10.7	35.7	14.3	3.6	16.2
		14.8	8.1	32.3	14.8	16.7	
		2.3	1.7	5.8	2.3	.6	
4 Disagree		15	16	9	11	1	73
		20.5	21.9	12.3	15.1	1.4	42.2
		55.6	43.2	29.0	40.7	16.7	
		8.7	9.2	5.2	6.4	.6	
	Column Total	27	37	31	27	6	173
(Continued)		15.6	21.4	17.9	15.6	3.5	100.0

III.4 Page 4 of 6

II.21	Count / Row Pct / Col Pct / Tot Pct	Rice (6)	Cotton (7)	Poultry/ livestoc (8)	Other (9)	Farm supply AND (10)	Row Total
3 Neutral			1	2		3	28
			3.6	7.1		10.7	16.2
			12.5	22.2		15.0	
			.6	1.2		1.7	
4 Disagree		1	6	4	4	6	73
		1.4	8.2	5.5	5.5	8.2	42.2
		50.0	75.0	44.4	66.7	30.0	
		.6	3.5	2.3	2.3	3.5	
	Column Total	2	8	9	6	20	173
(Continued)		1.2	4.6	5.2	3.5	11.6	100.0

III.4 Page 5 of 6

II.21	Count / Row Pct / Col Pct / Tot Pct	Fruits and vegetables (1)	Farm supply (2)	Dairy (3)	Grain (4)	Sugar (5)	Row Total
5 Strongly disagre		1	2	5	5	2	21
		4.8	9.5	23.8	23.8	9.5	12.1
		3.7	5.4	16.1	18.5	33.3	
		.6	1.2	2.9	2.9	1.2	
	Column Total	27	37	31	27	6	173
(Continued)		15.6	21.4	17.9	15.6	3.5	100.0

II.21 by III.4

II.21	Count / Row Pct / Col Pct / Tot Pct	III.4 Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm sup ply AND 10	Row Total
Strongly disagre	5			2		4	21
				9.5		19.0	12.1
				22.2		20.0	
				1.2		2.3	
	Column Total	2	8	9	6	20	173
		1.2	4.6	5.2	3.5	11.6	100.0

Number of Missing Observations: 5

II.22 by III.1.3

III.1.3 Page 1 of 3

II.22	Count / Row Pct / Col Pct / Tot Pct	less tha n $30 mi 1	$31 to $ 50 milli 2	$51 to $ 99 milli 3	$100 mil lion and 4	Row Total
1 Strongly agree		1		1	3	5
		20.0		20.0	60.0	2.9
		2.4		2.9	4.5	
		.6		.6	1.7	
2 Agree		18	9	10	16	53
		34.0	17.0	18.9	30.2	30.5
		43.9	27.3	29.4	24.2	
		10.3	5.2	5.7	9.2	
	Column Total	41	33	34	66	174
		23.6	19.0	19.5	37.9	100.0

(Continued)

II.22	Count / Row Pct / Col Pct / Tot Pct	less tha n $30 mi 1	$31 to $ 50 milli 2	$51 to $ 99 milli 3	$100 mil lion and 4	Row Total
3 Neutral		1	3	7	16	27
		3.7	11.1	25.9	59.3	15.5
		2.4	9.1	20.6	24.2	
		.6	1.7	4.0	9.2	
4 Disagree		20	19	16	30	85
		23.5	22.4	18.8	35.3	48.9
		48.8	57.6	47.1	45.5	
		11.5	10.9	9.2	17.2	
	Column Total	41	33	34	66	174
		23.6	19.0	19.5	37.9	100.0

(Continued)

II.22	Count / Row Pct / Col Pct / Tot Pct	less tha n $30 mi 1	$31 to $ 50 milli 2	$51 to $ 99 milli 3	$100 mil lion and 4	Row Total
5 Strongly disagre		1	2		1	4
		25.0	50.0		25.0	2.3
		2.4	6.1		1.5	
		.6	1.1		.6	
	Column Total	41	33	34	66	174
		23.6	19.0	19.5	37.9	100.0

Number of Missing Observations: 4

II.23 by III.1.3

III.1.3 Page 1 of 3

II.23	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
1 Strongly agree		1	1	2	3	7
		14.3	14.3	28.6	42.9	4.1
		2.4	3.0	6.1	4.6	
		.6	.6	1.2	1.7	
2 Agree		15	9	8	13	45
		33.3	20.0	17.8	28.9	26.2
		36.6	27.3	24.2	20.0	
		8.7	5.2	4.7	7.6	
	Column Total	41	33	33	65	172
(Continued)		23.8	19.2	19.2	37.8	100.0

II.23	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
3 Neutral		10	2	12	20	44
		22.7	4.5	27.3	45.5	25.6
		24.4	6.1	36.4	30.8	
		5.8	1.2	7.0	11.6	
4 Disagree		14	20	11	28	73
		19.2	27.4	15.1	38.4	42.4
		34.1	60.6	33.3	43.1	
		8.1	11.6	6.4	16.3	
	Column Total	41	33	33	65	172
(Continued)		23.8	19.2	19.2	37.8	100.0

II.23	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
5 Strongly disagre		1	1		1	3
		33.3	33.3		33.3	1.7
		2.4	3.0		1.5	
		.6	.6		.6	
	Column Total	41	33	33	65	172
		23.8	19.2	19.2	37.8	100.0

Number of Missing Observations: 6

II.26 by III.1.3

III.1.3 Page 1 of 3

II.26	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
1 Strongly agree		9	7	10	13	39
		23.1	17.9	25.6	33.3	22.5
		22.0	21.2	29.4	20.0	
		5.2	4.0	5.8	7.5	
2 Agree		17	16	12	21	66
		25.8	24.2	18.2	31.8	38.2
		41.5	48.5	35.3	32.3	
		9.8	9.2	6.9	12.1	
Column Total		41	33	34	65	173
		23.7	19.1	19.7	37.6	100.0

(Continued)

II.26	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
3 Neutral		9	6	9	21	45
		20.0	13.3	20.0	46.7	26.0
		22.0	18.2	26.5	32.3	
		5.2	3.5	5.2	12.1	
4 Disagree		6	3	2	9	20
		30.0	15.0	10.0	45.0	11.6
		14.6	9.1	5.9	13.8	
		3.5	1.7	1.2	5.2	
Column Total		41	33	34	65	173
		23.7	19.1	19.7	37.6	100.0

(Continued)

II.26	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
5 Strongly disagre			1	1	1	3
			33.3	33.3	33.3	1.7
			3.0	2.9	1.5	
			.6	.6	.6	
Column Total		41	33	34	65	173
		23.7	19.1	19.7	37.6	100.0

Number of Missing Observations: 5

II.26 by III.4

II.26	Count / Row Pct / Col Pct / Tot Pct	III.4 Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
1 Strongly agree		5	5	4	9		39
		12.8	12.8	10.3	23.1		22.4
		18.5	13.5	12.9	33.3		
		2.9	2.9	2.3	5.2		
2 Agree		6	20	11	13	3	67
		9.0	29.9	16.4	19.4	4.5	38.5
		22.2	54.1	35.5	48.1	50.0	
		3.4	11.5	6.3	7.5	1.7	
Column Total		27	37	31	27	6	174
(Continued)		15.5	21.3	17.8	15.5	3.4	100.0

II.26	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
1 Strongly agree			2	4	1	9	39
			5.1	10.3	2.6	23.1	22.4
			25.0	44.4	14.3	45.0	
			1.1	2.3	.6	5.2	
2 Agree			5	4	1	4	67
			7.5	6.0	1.5	6.0	38.5
			62.5	44.4	14.3	20.0	
			2.9	2.3	.6	2.3	
Column Total		2	8	9	7	20	174
(Continued)		1.1	4.6	5.2	4.0	11.5	100.0

III.4 Page 3 of 6

II.26	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
	3	10	8	15	3	2	45
Neutral		22.2	17.8	33.3	6.7	4.4	25.9
		37.0	21.6	48.4	11.1	33.3	
		5.7	4.6	8.6	1.7	1.1	
	4	5	3	1	2	1	20
Disagree		25.0	15.0	5.0	10.0	5.0	11.5
		18.5	8.1	3.2	7.4	16.7	
		2.9	1.7	.6	1.1	.6	
	Column	27	37	31	27	6	174
(Continued)	Total	15.5	21.3	17.8	15.5	3.4	100.0

III.4 Page 4 of 6

II.26	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
	3				3	4	45
Neutral					6.7	8.9	25.9
					42.9	20.0	
					1.7	2.3	
	4	1	1	1	2	3	20
Disagree		5.0	5.0	5.0	10.0	15.0	11.5
		50.0	12.5	11.1	28.6	15.0	
		.6	.6	.6	1.1	1.7	
	Column	2	8	9	7	20	174
(Continued)	Total	1.1	4.6	5.2	4.0	11.5	100.0

III.4 Page 5 of 6

II.26	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
	5	1	1				3
Strongly disagre		33.3	33.3				1.7
		3.7	2.7				
		.6	.6				
	Column	27	37	31	27	6	174
(Continued)	Total	15.5	21.3	17.8	15.5	3.4	100.0

II.26	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm sup ply AND 10	Row Total
5 Strongly disagre		1 33.3 50.0 .6					3 1.7
	Column Total	2 1.1	8 4.6	9 5.2	7 4.0	20 11.5	174 100.0

Number of Missing Observations: 4

II.27 by III.1.3

III.1.3 Page 1 of 3

II.27	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
1 Strongly agree		3	4	3	3	13
		23.1	30.8	23.1	23.1	7.6
		7.3	12.5	8.8	4.7	
		1.8	2.3	1.8	1.8	
2 Agree		22	13	13	13	61
		36.1	21.3	21.3	21.3	35.7
		53.7	40.6	38.2	20.3	
		12.9	7.6	7.6	7.6	
	Column Total	41	32	34	64	171
		24.0	18.7	19.9	37.4	100.0

(Continued)

II.27	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
3 Neutral		10	10	9	29	58
		17.2	17.2	15.5	50.0	33.9
		24.4	31.3	26.5	45.3	
		5.8	5.8	5.3	17.0	
4 Disagree		3	3	8	14	28
		10.7	10.7	28.6	50.0	16.4
		7.3	9.4	23.5	21.9	
		1.8	1.8	4.7	8.2	
	Column Total	41	32	34	64	171
		24.0	18.7	19.9	37.4	100.0

(Continued)

II.27	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
5 Strongly disagre		3	2	1	5	11
		27.3	18.2	9.1	45.5	6.4
		7.3	6.3	2.9	7.8	
		1.8	1.2	.6	2.9	
	Column Total	41	32	34	64	171
		24.0	18.7	19.9	37.4	100.0

Number of Missing Observations: 7

II.27 by III.4

III.4 Page 1 of 6

II.27	Count / Row Pct / Col Pct / Tot Pct	Fruits and vegetables (1)	Farm supply (2)	Dairy (3)	Grain (4)	Sugar (5)	Row Total
1 Strongly agree			3 23.1 8.3 1.7	1 7.7 3.2 .6	1 7.7 3.7 .6		13 7.6
2 Agree		11 17.7 40.7 6.4	14 22.6 38.9 8.1	7 11.3 22.6 4.1	15 24.2 55.6 8.7	2 3.2 33.3 1.2	62 36.0
(Continued)	Column Total	27 15.7	36 20.9	31 18.0	27 15.7	6 3.5	172 100.0

III.4 Page 2 of 6

II.27	Count / Row Pct / Col Pct / Tot Pct	Rice (6)	Cotton (7)	Poultry/ livestoc (8)	Other (9)	Farm supply AND (10)	Row Total
1 Strongly agree			2 15.4 25.0 1.2	1 7.7 12.5 .6	1 7.7 14.3 .6	4 30.8 20.0 2.3	13 7.6
2 Agree			4 6.5 50.0 2.3	2 3.2 25.0 1.2	2 3.2 28.6 1.2	5 8.1 25.0 2.9	62 36.0
(Continued)	Column Total	2 1.2	8 4.7	8 4.7	7 4.1	20 11.6	172 100.0

III.4 Page 3 of 6

II.27	Count / Row Pct / Col Pct / Tot Pct	Fruits and vegetables 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
3 Neutral		8 13.8 29.6 4.7	11 19.0 30.6 6.4	15 25.9 48.4 8.7	8 13.8 29.6 4.7	2 3.4 33.3 1.2	58 33.7
4 Disagree		6 21.4 22.2 3.5	7 25.0 19.4 4.1	5 17.9 16.1 2.9	2 7.1 7.4 1.2	1 3.6 16.7 .6	28 16.3
Column Total		27 15.7	36 20.9	31 18.0	27 15.7	6 3.5	172 100.0

(Continued)

III.4 Page 4 of 6

II.27	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
3 Neutral			1 1.7 12.5 .6	4 6.9 50.0 2.3	1 1.7 14.3 .6	8 13.8 40.0 4.7	58 33.7
4 Disagree		1 3.6 50.0 .6		1 3.6 12.5 .6	3 10.7 42.9 1.7	2 7.1 10.0 1.2	28 16.3
Column Total		2 1.2	8 4.7	8 4.7	7 4.1	20 11.6	172 100.0

(Continued)

II.27 by III.4

III.4 Page 5 of 6

II.27	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
5 Strongly disagre		2	1	3	1	1	11
		18.2	9.1	27.3	9.1	9.1	6.4
		7.4	2.8	9.7	3.7	16.7	
		1.2	.6	1.7	.6	.6	
	Column Total	27	36	31	27	6	172
(Continued)		15.7	20.9	18.0	15.7	3.5	100.0

II.27 by III.4

III.4 Page 6 of 6

II.27	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
5 Strongly disagre		1	1			1	11
		9.1	9.1			9.1	6.4
		50.0	12.5			5.0	
		.6	.6			.6	
	Column Total	2	8	8	7	20	172
		1.2	4.7	4.7	4.1	11.6	100.0

Number of Missing Observations: 6

II.33 by III.4

III.4 Page 1 of 6

II.33	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
Strongly agree	1	1 6.3 4.0 .6	6 37.5 16.7 3.6	1 6.3 3.3 .6	4 25.0 14.8 2.4		16 9.5
Agree	2	11 15.7 44.0 6.5	14 20.0 38.9 8.3	10 14.3 33.3 5.9	13 18.6 48.1 7.7	1 1.4 16.7 .6	70 41.4
(Continued)	Column Total	25 14.8	36 21.3	30 17.8	27 16.0	6 3.6	169 100.0

III.4 Page 2 of 6

II.33	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
Strongly agree	1					4 25.0 20.0 2.4	16 9.5
Agree	2	1 1.4 100.0 .6	5 7.1 62.5 3.0	4 5.7 44.4 2.4	3 4.3 42.9 1.8	8 11.4 40.0 4.7	70 41.4
(Continued)	Column Total	1 .6	8 4.7	9 5.3	7 4.1	20 11.8	169 100.0

III.4 Page 3 of 6

II.33	Count / Row Pct / Col Pct / Tot Pct	Fruits and vegetables 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
Neutral	3	10 20.4 40.0 5.9	12 24.5 33.3 7.1	13 26.5 43.3 7.7	5 10.2 18.5 3.0		49 29.0
Disagree	4	1 4.2 4.0 .6	3 12.5 8.3 1.8	6 25.0 20.0 3.6	5 20.8 18.5 3.0	2 8.3 33.3 1.2	24 14.2
(Continued)	Column Total	25 14.8	36 21.3	30 17.8	27 16.0	6 3.6	169 100.0

III.4 Page 4 of 6

II.33	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
Neutral	3		1 2.0 12.5 .6	3 6.1 33.3 1.8	3 6.1 42.9 1.8	2 4.1 10.0 1.2	49 29.0
Disagree	4		1 4.2 12.5 .6	1 4.2 11.1 .6	1 4.2 14.3 .6	4 16.7 20.0 2.4	24 14.2
(Continued)	Column Total	1 .6	8 4.7	9 5.3	7 4.1	20 11.8	169 100.0

II.33 by III.4

III.4 Page 5 of 6

II.33	Count / Row Pct / Col Pct / Tot Pct	Fruits and vegetables (1)	Farm supply (2)	Dairy (3)	Grain (4)	Sugar (5)	Row Total
5 Strongly disagre		2	1			3	10
		20.0	10.0			30.0	5.9
		8.0	2.8			50.0	
		1.2	.6			1.8	
	Column Total	25	36	30	27	6	169
		14.8	21.3	17.8	16.0	3.6	100.0

(Continued)

III.4 Page 6 of 6

II.33	Count / Row Pct / Col Pct / Tot Pct	Rice (6)	Cotton (7)	Poultry/ livestoc (8)	Other (9)	Farm supply AND (10)	Row Total
5 Strongly disagre			1	1		2	10
			10.0	10.0		20.0	5.9
			12.5	11.1		10.0	
			.6	.6		1.2	
	Column Total	1	8	9	7	20	169
		.6	4.7	5.3	4.1	11.8	100.0

Number of Missing Observations: 9

II.34 by III.1.3

III.1.3 Page 1 of 3

II.34	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
1 Strongly agree		4	2	2	2	10
		40.0	20.0	20.0	20.0	5.8
		10.0	6.3	5.7	3.1	
		2.3	1.2	1.2	1.2	
2 Agree		11	5	2	7	25
		44.0	20.0	8.0	28.0	14.6
		27.5	15.6	5.7	10.9	
		6.4	2.9	1.2	4.1	
	Column Total	40	32	35	64	171
		23.4	18.7	20.5	37.4	100.0

(Continued)

II.34	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
3 Neutral		14	7	13	16	50
		28.0	14.0	26.0	32.0	29.2
		35.0	21.9	37.1	25.0	
		8.2	4.1	7.6	9.4	
4 Disagree		9	15	15	33	72
		12.5	20.8	20.8	45.8	42.1
		22.5	46.9	42.9	51.6	
		5.3	8.8	8.8	19.3	
	Column Total	40	32	35	64	171
		23.4	18.7	20.5	37.4	100.0

(Continued)

II.34	Count / Row Pct / Col Pct / Tot Pct	less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
5 Strongly disagre		2	3	3	6	14
		14.3	21.4	21.4	42.9	8.2
		5.0	9.4	8.6	9.4	
		1.2	1.8	1.8	3.5	
	Column Total	40	32	35	64	171
		23.4	18.7	20.5	37.4	100.0

Number of Missing Observations: 7

Appendix I

Crosstabulations from Chapter 7

(Question numbers refer to questionnaire in Appendix B)

I.34 by III.4

I.34	Count / Row Pct / Col Pct / Tot Pct	III.4 Fruits and vegetables (1)	Farm supply (2)	Dairy (3)	Grain (4)	Sugar (5)	Row Total
1 They should advi		11	15	18	16	5	85
		12.9	17.6	21.2	18.8	5.9	48.0
		40.7	40.5	52.9	59.3	83.3	
		6.2	8.5	10.2	9.0	2.8	
2 They should stro		11	19	10	6		64
		17.2	29.7	15.6	9.4		36.2
		40.7	51.4	29.4	22.2		
		6.2	10.7	5.6	3.4		
Column Total		27	37	34	27	6	177
		15.3	20.9	19.2	15.3	3.4	100.0

(Continued)

I.34 by III.4

I.34	Count / Row Pct / Col Pct / Tot Pct	III.4 Rice (6)	Cotton (7)	Poultry/ livestoc (8)	Other (9)	Farm supply AND (10)	Row Total
1 They should advi			4	4	3	9	85
			4.7	4.7	3.5	10.6	48.0
			50.0	44.4	42.9	45.0	
			2.3	2.3	1.7	5.1	
2 They should stro		2	3	3	2	8	64
		3.1	4.7	4.7	3.1	12.5	36.2
		100.0	37.5	33.3	28.6	40.0	
		1.1	1.7	1.7	1.1	4.5	
Column Total		2	8	9	7	20	177
		1.1	4.5	5.1	4.0	11.3	100.0

(Continued)

I.34 by III.4

III.4 Page 3 of 4

I.34	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
3		3	3	3	3	1	17
They should deny		17.6	17.6	17.6	17.6	5.9	9.6
		11.1	8.1	8.8	11.1	16.7	
		1.7	1.7	1.7	1.7	.6	
5		2		3	2		11
They should do n		18.2		27.3	18.2		6.2
		7.4		8.8	7.4		
		1.1		1.7	1.1		
Column		27	37	34	27	6	177
(Continued) Total		15.3	20.9	19.2	15.3	3.4	100.0

I.34 by III.4

III.4 Page 4 of 4

I.34	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
3				1		3	17
They should deny				5.9		17.6	9.6
				11.1		15.0	
				.6		1.7	
5			1	1	2		11
They should do n			9.1	9.1	18.2		6.2
			12.5	11.1	28.6		
			.6	.6	1.1		
Column		2	8	9	7	20	177
Total		1.1	4.5	5.1	4.0	11.3	100.0

Number of Missing Observations: 1

I.36 by III.4

III.4 Page 1 of 2

I.36	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
Yes	1	17	23	14	14	2	97
		17.5	23.7	14.4	14.4	2.1	59.1
		68.0	67.6	46.7	53.8	33.3	
		10.4	14.0	8.5	8.5	1.2	
No	2	8	11	16	12	4	67
		11.9	16.4	23.9	17.9	6.0	40.9
		32.0	32.4	53.3	46.2	66.7	
		4.9	6.7	9.8	7.3	2.4	
	Column Total	25	34	30	26	6	164
		15.2	20.7	18.3	15.9	3.7	100.0

(Continued)

I.36 by III.4

III.4 Page 2 of 2

I.36	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
Yes	1	1	5	8	4	9	97
		1.0	5.2	8.2	4.1	9.3	59.1
		50.0	62.5	88.9	57.1	52.9	
		.6	3.0	4.9	2.4	5.5	
No	2	1	3	1	3	8	67
		1.5	4.5	1.5	4.5	11.9	40.9
		50.0	37.5	11.1	42.9	47.1	
		.6	1.8	.6	1.8	4.9	
	Column Total	2	8	9	7	17	164
		1.2	4.9	5.5	4.3	10.4	100.0

Number of Missing Observations: 14

I.37 by III.1.3

I.37	Count / Row Pct / Col Pct / Tot Pct	III.1.3 less than $30 million 1	$31 to $50 million 2	$51 to $99 million 3	$100 million and 4	Row Total
1 Yes	1	18	16	10	24	68
		26.5	23.5	14.7	35.3	41.7
		47.4	50.0	32.3	38.7	
		11.0	9.8	6.1	14.7	
2 No	2	20	16	21	38	95
		21.1	16.8	22.1	40.0	58.3
		52.6	50.0	67.7	61.3	
		12.3	9.8	12.9	23.3	
	Column Total	38	32	31	62	163
		23.3	19.6	19.0	38.0	100.0

Number of Missing Observations: 15

I.37 by III.4

III.4 Page 1 of 2

I.37	Count / Row Pct / Col Pct / Tot Pct	Fruits and veget 1	Farm supply 2	Dairy 3	Grain 4	Sugar 5	Row Total
1		7	16	13	15	2	69
Yes		10.1	23.2	18.8	21.7	2.9	42.1
		30.4	45.7	40.6	57.7	33.3	
		4.3	9.8	7.9	9.1	1.2	
2		16	19	19	11	4	95
No		16.8	20.0	20.0	11.6	4.2	57.9
		69.6	54.3	59.4	42.3	66.7	
		9.8	11.6	11.6	6.7	2.4	
Column Total		23	35	32	26	6	164
(Continued)		14.0	21.3	19.5	15.9	3.7	100.0

I.37 by III.4

III.4 Page 2 of 2

I.37	Count / Row Pct / Col Pct / Tot Pct	Rice 6	Cotton 7	Poultry/ livestoc 8	Other 9	Farm supply AND 10	Row Total
1		1	4	3	1	7	69
Yes		1.4	5.8	4.3	1.4	10.1	42.1
		50.0	50.0	37.5	16.7	38.9	
		.6	2.4	1.8	.6	4.3	
2		1	4	5	5	11	95
No		1.1	4.2	5.3	5.3	11.6	57.9
		50.0	50.0	62.5	83.3	61.1	
		.6	2.4	3.0	3.0	6.7	
Column Total		2	8	8	6	18	164
		1.2	4.9	4.9	3.7	11.0	100.0

Number of Missing Observations: 14

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