AN ANALYSIS OF COST ALLOCATION AND LOAN PRICING IN THE BANKS FOR COOPERATIVES

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ABSTRACT

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This research analyzes the pricing practices of the Banks for Cooperatives (BCs), incorporating cooperative theory with the realities of the competitive market these institutions face. Reports of individual bank financial information and descriptions of operating procedures from bank officials are the primary data sources. The economic characteristics are considered as four components: the cost of funds, operating costs, credit risk costs, and the allocation of net savings.

The BCs have moved toward greater pricing differentiation, much of which can be characterized as a movement from average to marginal cost pricing, particularly for the cost of funds. Operating costs pose a larger problem for differentiation due to unallocable overhead costs and significant economies of scale in borrower relationships. There is an increasing awareness of differentiation based on credit quality, but in practice an average cost pricing rule predominates. Net savings is allocated on a single pool basis in most cases.

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LIST OF ABBREVIATIONS

BC(s)	Bank(s) for Cooperatives
CBC	Central Bank for Cooperatives
FCA	Farm Credit Administration
FCS	Farm Credit System
FICB	Federal Intermediate Credit Bank
FLB	Federal Land Bank
PCA	Production Credit Association
FAC	Farm Credit System Financial Assistance Corporation

CHAPTER 1

INTRODUCTION

The Banks for Cooperatives (BCs) have been the primary source of credit for agricultural cooperatives in the United States, and have been a major catalyst for growth and expansion among them. However, in recent years the agricultural sector and financial services industry have undergone major structural changes that have reshaped the environment the BCs operate within. As a result, the BCs face some major institutional issues in developing pricing and cost allocation policies that meet the requirements of an increasingly heterogeneous membership in a highly competitive environment, while operating as a cooperative within their legislative mandate.

This chapter will outline the major forces of change that have shaped their current environment. The specific objectives of this study will then be presented, followed by a discussion of data sources to be used.

Major Forces of Change

Competition

The competitive environment facing the BCs has changed dramatically since their inception in 1933 to improve access to credit for agriculture. Agriculture has developed a great deal in the past 50 years, attracting the interest of traditional lenders who had been

uninterested in the sector. In addition, the more highly developed financial markets of today provide direct funding to a much broader spectrum of businesses, including agricultural cooperatives.

Project 1995, an information gathering and planning project of the Farm Credit System, highlighted the movement of the system towards the more competitive environment. Some of the discussion in this section and the following one will draw on that study (Farm Credit System) and a more specific study by Hopkin, et.al. conducted for the Banks for Cooperatives in 1987.[1]

Over the past 25 years the financial services industry has evolved from neatly segmented financial institutions, based primarily on geography and product, to an industry of highly diversified firms operating in a very competitive environment. Statutory and regulatory changes have tended to reinforce these changes in recent years as well. The BCs have traditionally had a very high penetration in the extension of credit to agricultural cooperatives. Large banking concerns, including Bank of America, Wells Fargo, and Continental Illinois, have been involved in the financing of some cooperatives for many years (Hopkin, et. al.). However, the more competitive environment, including non-bank competition, has increased interest in financing the stronger cooperatives.

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[1]Hopkin, et.al. (1987) is the original study commissioned by the BCs. The results were published in a similar, but more technical form in Hopkin, et.al. (1988) that is cited where the information is particular to that publication.

The European Cooperative Banks (ECBs) have also become another competitor to the BCs. The ECBs, including Rabobank of the Netherlands, D.G. Bank of Germany, and Credit Agricole of France, have become international full-service commercial, agricultural, and investment banks, involved in a world-wide market. They have accepted deposits from their beginning, and in recent years have broadened their geographic scope to find better returns on investments and a home for excess funds. Credit Agricole and Rabobank have been very active in their interest in large cooperative borrowers.

The financial difficulties of the Farm Credit System in recent years have also brought greater competitive pressures upon the BCs in two main ways.[2] First, while the BCs have largely been profitable and in sound financial shape themselves, their financial obligations as a part of the total system have raised borrower concerns about the impact of large losses in some system institutions since all are jointly and

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[2]The Farm Credit System (FCS) has historically consisted of three different bank groups intended to serve different purposes. The Federal Land Banks (FLBs) were established in 1916 to make long term agricultural loans through local FLB associations. The Federal Intermediate Credit Banks (FICBs) were established in 1923 to provide funds for short term agricultural loans through local Production Associations (PCAs) and other financial institutions. The BCs were created in 1933 to finance rural agricultural cooperatives, now including rural utility and telephone cooperatives. Each bank group was organized into 12 geographically distinct districts, with the BCs also having a jointly owned bank of participation, the Central Bank for Cooperatives (CBC), formed to fund loans that exceed their individual lending limits. The institutions were originally capitalized by the federal government, but member invested capital eventually replaced the government funds. All banks are now capitalized and governed as cooperatives, with some recent changes to this structure to be discussed later. As of December 31, 1987, net loans outstanding totalled $32.2 billion for the FLBs and their associations; $9.3 billion for the FICBs and PCAs; and $8.1 billion for the BCs.

severally liable for FCS bonds and notes. If a system institution was unable to meet its debt service obligations the rest of the system would be required to meet the obligations. If the problem were large enough it could lead to significant costs for the BCs.

A second, more immediate, impact of system financial difficulties was an increase in the relative cost of funds raised in financial markets for new debt issues during the recent tumultuous years. The interest rate difference between new Farm Credit debt issues and comparable Treasury instruments was significantly higher as the markets reflected additional risk premiums based on the System's poor financial performance. The Agricultural Credit Act of 1987 significantly reduced these premiums by making financial assistance available that allayed investor concerns, but also added insurance fund safeguards that may increase funding costs somewhat above historical levels.

Heterogeneity of Members

Another transition in agriculture facing the BCs is the growing heterogeneity of agricultural producers and its impact on cooperatives. The growing concentration of agricultural production in the hands of large farmers demands that cooperatives meet the needs of large producers that represent much of their business volume, while still maintaining the support of their membership largely composed of smaller farmers. These structural changes have contributed to a significant decline in the number of agricultural cooperatives from 9,000 in 1969 down to just over 6,000 in 1980. Projections are for this number to fall to 3,400 by the year 2000 (Hopkin, et.al.). These reductions in numbers represent more a consolidation of sales than a reduction in sales.

The BCs face a similar situation. Loan volume is concentrated in a relatively small number of large customers. These include the large regional cooperatives and rural utilities, as well as some very large specialized cooperatives. Based on average gross loans outstanding during 1987, only 3 of the 12 district BCs had over 50% of their loan volume extended to local cooperatives while much of their membership by numbers was concentrated in local cooperatives (Special Committee on BC Structure).[3] In addition, some local cooperatives have now evolved into "superlocals" that are much larger and more complex than the traditional local cooperatives.

Figure 1.1 illustrates the significant difference between the average loan commitment to the largest 10% of each BC's customers by number, and the average loan commitment to their remaining customers. The actual number of cooperatives included in the largest 10% varies a great deal since in smaller districts such as Columbia, the largest 10% represents only eight cooperatives, while in St. Paul it represents 67 customers. However, data considering the largest 10 customers in each district supports this relationship as well.

While the large customers supply much of the equity in the BC, each cooperative only is allowed one vote, which may be substantially less than their proportional share of equity.[4] More importantly, their size

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[3]Local cooperatives are smaller organizations that serve a limited geographic area, most frequently providing farm supplies and/or commodity marketing related functions. Regional cooperatives serve a much broader geographic area, often being formed as a federation of local cooperatives to gain economies of size and scope.

[4]As a cooperative themselves, the BCs are owned by the cooperatives that borrow from them. Member stock includes both an outright

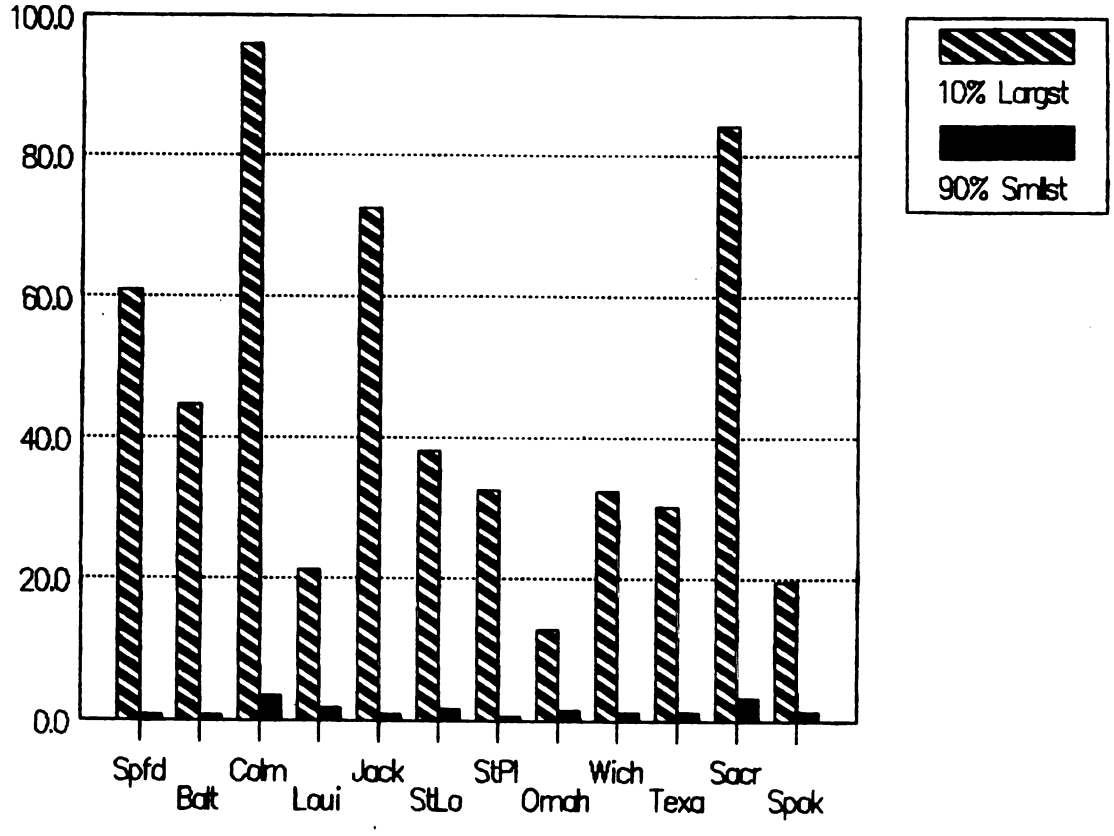

Figure 1.1. Average Loan Commitment of the Largest 10% and Smallest 90% of Customers, 12/31/87. (Special Committee on BC Structure, Exhibit 3)

gives them ready access to the major credit markets and larger banking concerns. These organizations also are likely to place more competitive negotiation pressure on the BCs through highly qualified financial officers that have access to financial market information. Many of the superlocals have also achieved a similar level of financial sophistication, and have become more attractive to other lenders as they have grown in size.

This small number of large borrowers can be contrasted with the large number of local cooperatives with substantially smaller relative individual debt needs, and in many cases a less sophisticated financial staff. While this borrower size and sophistication issue is not a completely new phenomenon, increased competition within the financial sector and increasing heterogeneity among borrowers have brought the issue to the forefront. The BCs are faced with meeting the needs of a very diverse membership operating within many different markets in a competitive environment, while still operating within the cooperative framework of organization.

In an effort to meet competitive pressures in various borrower segments, the practice of differential loan pricing has become much more prevalent. The idea is often seen as a way of meeting or responding to competitive pressures in order to prevent borrowers from leaving the BC for other sources of financing. However, an equally important issue is

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investment in BC stock, typically tied in some manner to the level of financing used, and the non-cash allocation of earnings to members. The Agricultural Credit Act of 1987 provided a guarantee on current stock investment, but explicitly requires future stock investment to be at risk.

the impact that the pursuit of a differential loan pricing program will have on the the BC's other members.

Recent Legislation

Adding to this already complicated set of issues are the enactment of the Farm Credit Act Amendments of 1986 and the Agricultural Credit Act of 1987. These two events need to be discussed in some detail to provide a perspective on the formulation of realistic research objectives.

The Farm Credit Act Amendments of 1986 eliminated Farm Credit Administration (FCA) approval requirements on interest rates, thus offering banks more flexibility and control of loan pricing programs. However, the Act also required the system to "provide equitable and competitive interest rates, ...but in no case a rate below competitive market rates." As a result this analysis must take place within this constraint of the legislative mandate.

The Agricultural Credit Act of 1987, signed into law on January 6, 1988, mandated a number of major structural changes within the system, in addition to providing financial assistance. Among other things, it had a direct impact on the BCs by requiring:

- o stockholders of the 12 district BCs and the Central Bank for Cooperatives (CBC) to vote on merger into a National Bank for Cooperatives (National Bank) within six months of enactment. Approval by eight or more district BCs would be required for a National Bank, with the resulting BCs no longer being limited by geographic boundaries. A United Bank would be formed if from two to seven district BCs approved a merger, with territorial boundaries being maintained.

- o the merger approval would require not only the prior requirement of a majority based on one member-one vote, but also a majority based on total equity interests in a given BC.
- o that a separate BC board be organized in each district, composed of directors elected by voting stockholders with at least one outside member elected by the other directors.
- o borrower stock purchased prior to October 6, 1988 be guaranteed for retirement at book value. However, new bylaws were mandated that would more clearly place borrower stock in an "at risk" position, with the government stock guarantee phased out after 5 years through capital adequacy standards.
- o that FCA establish minimum permanent capital adequacy standards based on the ratio of capital to assets, taking into account the relative risk of assets.
- o the establishment of a Farm Credit System Insurance Corporation to protect bondholders that would operate in much the same way as the Federal Deposit Insurance Corporation.

The legislative actions outlined above include major provisions that have an impact on costs within the BCs, and the ways in which its borrowers are interdependent. In addition, in July of this year eight of the district BCs approved a merger into a National Bank. Subsequent to the original vote the Spokane and Jackson districts also revoted and agreed to join the National Bank. As a result, effective January 1, 1989, the BC system no longer consists of 12 district banks with distinct geographic boundaries and the CBC, but three BCs - Springfield, St. Paul, and the National Bank - with no geographic lending

restrictions. The National Bank still serves as a bank of participation for the other two banks, much as the CBC served the district BCs.

Research Overview

Objectives

It is into this environment that the objectives of this study are placed. The BCs face:

a) a competitive business environment that has changed a great deal in recent years,

b) a heterogeneous customer base,

c) some additional legislative mandates,

d) and dramatic institutional changes embodied in the Agricultural Credit Act of 1987, including the formation of a National BC with the expansion to national charters.

It would appear the most productive studies in this context would be issues that are impacted by the forces noted above, yet those that transcend them to the extent that the results of the study will be useful in evolving organizations. In this spirit, the study will focus on the loan pricing practices of the Banks for Cooperatives, with a specific emphasis on how costs are dealt with among a very heterogeneous cooperative membership.

The way that costs are reflected in loan pricing will affect individual borrowing costs, so fairness between members becomes an issue as cost allocation decisions are made in the loan pricing process. The logical question that follows is then, how do costs differ between borrowers, and what means is there to measure and price for the differences.

More specifically, the primary objective of this study will be to analyze the loan pricing practices of the Banks for Cooperatives in an effort to better understand the impact of pricing policies upon members within a cooperative context. Pricing will be decomposed into component parts in an effort to better understand unique attributes and pricing implications. For analysis, these components will be the cost of funds, operating costs, compensation for credit risk, and the patronage refund (residual remaining after all costs are covered). Current practices will be surveyed and evaluated; and alternatives will be considered.

Previous work has tended to look primarily at the direct farmer-owned level of the cooperative system, or in the case of the small number of BC studies, at capitalization and other firm level issues. This study will place much more emphasis on how the BC as a cooperative deals with the inherent interdependence of its members in pricing. In addition, the role of pricing in this context as a coordinator of activities among cooperatives will also be considered, since the BC plays a unique role as arbiter in this process.

Data and Data Collection

The data for this study will be drawn from a number of sources. A comprehensive collection of financial and aggregate customer profile information was assembled by the Special Committee on BC Structure as a part of the merger vote mandated by the Agricultural Credit Act of 1987. This information was compiled in a single volume of exhibits included in the proposal sent to BC stockholders. This served as a ready source of basic financial information on all of the BCs.

Descriptions of operating procedures of the 13 BCs were gathered through telephone contacts with a senior credit management individual

from each bank during December, 1988. A list of those contacted is included in the Appendix. Note that as of that date all 13 banks were still in existence and the questions were focused on each bank's current and past practices. Questions were developed after discussions with Bob Satrom of the CBC to get a general idea of what practices were in use. In addition, time was spent at the St. Paul BC developing a better understanding of pricing procedures through discussions with their senior management, credit, and finance personnel. Based on these discussions a more limited agenda was developed for use with all districts in a telephone setting.

Questions were necessarily policy-oriented in nature, and not focused at gathering extensive empirical data due to competitive and confidentiality concerns. Rather, the data took the form of descriptive information on the general practices used in differentiating loans for pricing purposes. The amount of detail provided varied among the districts.

Outline

Chapter 2 is devoted to a discussion of the major theoretical views of agricultural cooperation. These views provide a basis for looking more specifically at cooperative pricing, and development of a framework for analysis in Chapter 3. Based on this framework, pricing is then evaluated on the basis of individual components, with Chapter 4 considering the cost of funds, Chapter 5 on operating expenses, Chapter 6 on credit risk, and Chapter 7 on the allocation of net savings. Chapter 8 provides a summary and conclusions of the study.

CHAPTER 2

THEORETICAL VIEWS OF AGRICULTURAL COOPERATION

In order to better understand how the BC itself functions as a cooperative, this chapter will focus on the theoretical views that have been developed regarding agricultural cooperation. Economists began formal modeling attempts focused on agricultural cooperatives in the 1940s. The following summary of these theoretical views draws on literature reviews from Staatz (1984, 1987d).[1] This discussion is organized around two fairly distinct traditional views of farmer cooperatives that have emerged, and two more recent approaches that attempt to incorporate additional theoretical advances for a richer framework. These views include:

1) The cooperative as a form of vertical integration by independent firms. In most cases this involved independent farmers seeking to integrate into the marketing of agricultural production or the supply of production inputs.

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[1] Staatz cites additional sources of surveys on theoretical literature including Vitaliano (1976); Helmberger, Cambell, and Dobson (pp. 556-562); LeVay; and Sexton (1984a, 1984b). Much of Staatz (1984) has been published as "Farmers' Incentives to Take Collective Action via Cooperatives: A Transaction Cost Approach"(1987a), "A Game-Theoretic Analysis of Decisionmaking in Farmer Cooperatives"(1987b), and "The Structural Characteristics of Farmer Cooperatives and Their Behavioral Consequences"(1987c) In Cooperative Theory: New Approaches, ed. Jeffrey S. Royer. Washington D.C.: USDA ACS Service Report 18, July 1987.

2) The cooperative as a special case of the independent firm due to its customer ownership, but best analyzed similar to the investor-owned firm (IOF).

3) The cooperative as a coalition of previously competing firms that have banded together to capture the gains from joint action.

4) The cooperative as a coordinator of economic activity, unique from either firms or markets.

It should be noted that these views are primarily concerned with how the benefits and costs of cooperative activity are distributed among the members, which is the main issue of interest in this study, and how these in turn influence other aspects of performance (e.g., efficiency). Each of these views will be discussed briefly below.

A note should be made that the vast majority of the research done on cooperatives has focused on farm marketing and supply cooperatives, and to a lesser extent on consumer cooperatives. The business activities of the BCs closely parallels those of a farm supply cooperative where the BC supplies credit as an input to other cooperatives. However, farm supply cooperative member "firms" are mostly individuals or closely held corporate entities involved directly in farming. In the case of the BCs, the member "firms" are nearly all other cooperative entities.[2] As a result, the member representation

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[2]BC business with noncooperatives is limited to a few exceptions. First, there are cases where loans can be made to a noncooperative for the benefit of an eligible cooperative, as in a tax-oriented third party lease. Other exceptions include noncooperative rural utilities, and loans to noncooperatives used to facilitate the collection of high risk or loss loans originally made to eligible borrowers.

includes member cooperative managers and board members representing cooperatives, not individual farmer members.

Traditional Views

Vertical Integration

The vertical integration view stems from the cooperative principles of operation at cost and ownership tied to use. Since the cooperative passes all profits and losses along to its members, it can be argued to be a form of vertical integration by the cooperative member. The income tax treatment of cooperative earnings reinforces the vertical integration argument since federal tax liability on distributed cooperative earnings accrues to the member firm, not to the cooperative. The cooperative is not an independent firm, but rather a federation of sovereign firms.

The framework of analysis then focuses on the problems of trying to vertically coordinate and then jointly optimize the efforts of many separate firms with respect to the cooperative's specific business activities. In this framework the cooperative attempts to optimize the combined member-cooperative operation (i.e. joint profit maximization), rather than independently maximizing the cooperative's profit. This is in contrast to the theoretical view of the IOF.

The optimal level of output is established by equating the sum of the marginal revenue from the jointly produced output with the marginal costs incurred in the joint member-cooperative operation. Phillips argued that the benefits and costs of the joint plant would be shared in proportion to the member's share of the cooperative's total business volume.

Some problems with this view included the assumption that there were no overhead costs (or that they could be non-arbitrarily distributed), and difficulties in dealing with intertemporal benefits and costs. The latter issue is especially important where large fixed asset investments with an uncertain life or return are necessary, or where long-term business relationships play a significant role as in specialty commodity marketing and supply acquisition relationships. Given these problems, the Phillips argument noted above simply becomes an arbitrary "equitable" allocation method.

Critics also argued that the narrow vertical integration view did not adequately consider the cooperative as a separate locus of decision-making to which cooperative members delegate entrepreneurial functions to gain the advantages of joint action. In reality, while the member-owners still held formal control, they rarely reasserted this control except under extreme conditions, such as when they believed management exceeded its delegated authority. These concerns led to consideration of the cooperative as an independent firm.

The Cooperative as an Independent Firm

The model of the cooperative as an independent firm was introduced to consider the cooperative as a separate decision-making body. In this framework management attempted to optimize some objective function, very similar to the theoretical economic motives of the IOF. A very prominent paper by Helmberger and Hoos developed this aspect of cooperative theory based upon the standard neoclassical theory of the IOF. The theory was modified and extended to models for cooperative applications for both short-run and long-run behavior of an agricultural processing firm.

In this model the cooperative operates at a zero profit basis with all surplus (returns exceeding costs, often referred to as patronage refunds in the supply cooperative) returned to members. The supply cooperative is assumed to minimize the price of the good or service provided while still meeting the per unit cost of production (average cost). Members are assumed to be price takers so individual demand curves can be summed horizontally to form an aggregate demand curve for the cooperatively supplied input.

In the open membership cooperative this will take place where demand (average revenue) equals the average cost. A closed membership cooperative would attempt to limit membership so that the aggregate demand curve would intersect the long-run average cost curve at its minimum. Later Helmberger used this model to show that a monopsonistic processing cooperative with open membership would result in an equilibrium price and output closer to the perfectly competitive result than a monopsonistic IOF would (Staatz, 1987d).

A notable feature of their approach was the presence of a "peak coordinator", generally the cooperative manager, who defined the firm's goals and transmitted them to the rest of the organization. This assumption removes from the analysis any potential conflict over the goals of the organization. Most notable with respect to this study is the decision on how costs and benefits of group action will be distributed among participants with a broad range of noncooperative alternatives. The Helmberger and Hoos model treated members as price-takers receiving "uniform treatment" with all members accepting the "peak coordinator's" objective function as appropriate. In

addition, the model does not address who will receive the normal economic return incorporated in the theoretical average cost curve.

A debate over the cooperative being a firm or a vertical integration of the member firms seems somewhat misguided. Rather, it would appear much more productive to consider what characteristics both views offer in attempting to better understand agricultural cooperation. It is to this end that the theoretical discussions of the cooperative as a coalition and as a coordinator of economic activity are considered.

More Recent Approaches

In recent years many advances have been made in the theory of the IOF. Some examples include decision-making under uncertainty, behavioral theories of the firm, transaction cost economics, agency theory, and game theory applications to decision-making. Efforts have been made to extend some of these findings to cooperatives. Two approaches that incorporate this theory are discussed below.

The Cooperative as a Coalition

A troublesome feature of the cooperative as a firm models was the abstraction from intraorganizational conflict, including the assumption of a homogenous membership. Potential conflicts among member goals, or between cooperative management or other participants and the membership were not considered.

The critics that raised the issue of conflicting goals among a heterogeneous membership, and between membership and management, suggested that cooperative behavior in this context would reflect the

relative bargaining power of participants in the organization.[3] As a result, they argued that cooperative behavior could more accurately be viewed as a coalition of participants (e.g. cooperative members, management, board members) pursuing their own goals, and participating only as long as they felt their objectives were being met. In other words, the key issue was the allocation of pecuniary and nonpecuniary benefits among all participants in such a way that the economically necessary participants did not defect.

Analysis under the coalitional approach is concerned with the outcomes that result from the bargaining process, and whether a stable equilibria is reached. For example, cooperative practices such as one member-one vote, average cost pricing, and patronage based-financing are evaluated to determine whether they generate a solution where no participant has an incentive to change their behavior (i.e. defect).

Some of the recent work on the coalitional approach is of particular interest to this study. Work by Sexton (1984a, 1986) and Staatz (1983, 1984, 1987b) made use of game theory to analyze cooperative decision-making.

> "In the parlance of game theory, cooperative games are games in which players communicate and make binding commitments, such as contracts, with one another. The theory of cooperative games commonly is used to model situations in which there are gains from joint action by a potential coalition of players but where players must bargain among themselves about how the benefits are to be shared. Failure to agree on an allocation of net benefits among players prevents the coalition from forming. The essence of the argument is that individuals will not join in the cooperative's activities unless they are better off under that arrangement than under any alternative. In game-theoretic terms, the payoffs to the

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[3] For detailed discussions of recent work see Zusman, Knoeber and Baumer, Murray (1983a, 1983b), Sexton (1984a, 1986), and Staatz (1983, 1984, 1987b).

various participants must lie within the core of the game." (Staatz 1987c, pp. 88-89)

This approach is particularly useful since it allows the incorporation of transaction costs and "cooperative ideology" into the analysis. Staatz (1984, 1987b) shows how including these dimensions in the model broadens the set of potentially stable solutions. As a result, some cooperative practices that theoretically appear to be unstable but continue to exist in reality can be better understood. The coalitional approach also allows for a broader list of participants in the analysis framework. Not only are management, the board, and members key participants, but in many cases the government, non-cooperative customers, and competitors become key players.

One of the weaknesses of this coalitional approach is that fully determinant conclusions are often not reached. Rather, as in game theory work, the core group of solutions may be defined, but the final solution chosen within the core cannot be predicted.

The coalitional approach places much more emphasis on the interdependence of members and other participants in allocating the costs and benefits of collective action. As Staatz (1984, p.37) points out, "...many of the most contentious issues currently facing farmer cooperatives are coalitional, involving how the benefits of joint action should be shared among an increasingly diverse set of participants in the cooperatives and how the incentives facing individual participants can be structured so as to foster the well-being of the group as a whole." The issue of loan pricing within the BCs is a vivid example.

The Cooperative as a Coordinator of Economic Activity

The two traditional views of cooperatives tie in neatly with the traditional categories of economic coordination within the free market

economy. Williamson describes this categorization in his prologue (p. 7):

> "The prevailing orientation toward economic organization in the thirty-year hiatus between 1940 and 1970 was that technological features of firm and market organization were determinative. The allocation of economic activity as between firms and markets was taken as a datum; firms were characterized as production functions; markets served as signaling devices; contracting was accomplished through an auctioneer; and disputes were disregarded because of the presumed efficacy of court adjudication."

Williamson goes on to deal with the issue of uncertainty and the means by which firms use implicit and explicit contracting to economize on transaction costs. He argues that vertical integration is a means that organizations use to minimize transaction costs in the assignment of economic activity to either firms or markets.

Shaffer posits that cooperatives represent a third unique mode of economic coordination, separate from either vertical integration or the independent firm involved in the market. He states (p. 61) that cooperatives combine "characteristics of markets and internal (integrated) coordination in ways that are different from either."

Each of the three modes of economic coordination involves a different set of contractual terms among participants. Staatz (1987d, p. 87) differentiates the cooperative mode as a form of contingent contract.

> "...this contract differs from the links within a vertically integrated firm because the cooperative usually cannot dictate the production decisions of its farmer members, each of whom may have different objectives. The contract also differs from coordination that relies on the spot market in that the contract between the cooperative and member always is a contingent contract, with the final price, adjusted via the patronage refund, depending on the cooperative's performance."

It is important to realize that while the cooperative is collectively owned by its members, the member firms are independently

owned, operated, and managed. The member firms only interact with each other (i.e. horizontally) through the cooperative to the extent that they have agreed to act collectively. To the extent that they act collectively, they deviate from the market mode and offer a potential means of improved horizontal coordination.

The cooperative is also fundamentally different than vertical integration within the firm. While members jointly own the cooperative, the lines of control are much less clear than in the vertically integrated IOF. Since members remain independent, the cooperative is unable to exercise direct control over the decisions of its members. In addition, members as owners are unable to exercise complete control over the cooperative's actions. The cooperative is formally controlled through a member elected board, which in turn appoints management to direct the on-going functions of the organization. Direct control is diffused through this process as election rules affect board representation, and employees also add their own interests and perceptions to decision-making. In addition, all owner interests are not necessarily congruent due to the divergent needs of a heterogeneous membership. Finally, in some cases barriers to exit from the cooperative (e.g., few alternative markets, fear of reduced competition) may reduce member control.

IOF owners have a common objective of maximizing their return on investment. The market for stock serves as a disciplinary force on management as owners respond to returns through investment and disinvestment in its stock. Takeover firms also suggest that they assist in this disciplinary function. In the cooperative, an active market in stock typically does not exist. Cooperative owners must

exercise discipline through a political process of influence over management and the board (voice), and their continued patronage and membership (or lack thereof [exit]) in the organization (see Hirshman). All of these factors reinforce Shaffer's proposition that cooperatives represent a third mode of coordination.

Shaffer goes on to raise the coordination problem at four levels of economic activity:

- o Intrafirm (micro-micro coordination)
- o Between firms (micro coordination)
- o Within an industry (macro coordination)
- o In the economy as a whole (macro-macro coordination).

Within the context of this study the role of the large cooperative (e.g., the BCs) as a unique coordinator of economic activity needs to be raised. The loan pricing practices represent one of the most visible coordinating mechanisms employed.

Concluding Remarks

Each of these general theories describes some of the behavior of some cooperative. Each provides insights. The dominant theory probably varies with the size and type of cooperative. For example, a small cooperative that provides specialized processing and/or marketing functions may behave more like the traditional vertical integration view suggests. On the other hand, a very large cooperative serving diverse member needs may behave more like the recent theoretical approaches suggest. In addition, it is likely that the further management moves away from tight member control, the more likely it is that the cooperative may serve as a coordinator.

Approach of This Study

This work may be best characterized as an applied study in the allocation of the costs and benefits of collective action among participants in the BCs. Much of the analysis will implicitly make use of the coalitional view of cooperatives, and their role as a coordinating mechanism.

A logical point of departure in considering specific pricing practices is (a) to evaluate what pricing parameters are important to members in evaluating their willingness to continue participating in the coalition, and (b) to what extent it is feasible for the cooperative to price in this manner. From this information it should be possible to evaluate what pricing practices would likely result in payoffs to the participants that lie within the core, thus resulting in a stable solution.

Chapter 3 will review some of the relevant literature focusing directly on cooperative pricing issues. This will be followed by a summary of elements pertinent to analyzing the pricing practices of the BCs, and the development of a framework for analysis.

CHAPTER 3

THE ALLOCATION OF COSTS IN COOPERATIVE PRICING

While the BCs have been a topic of research in recent years, much of the focus has been on the BC as a firm or individual cooperatives in relation to the BC, with little emphasis on the interdependence of cooperative members with each other. The increased pressures outlined in Chapter 1 have made the task of finding a pricing structure that maintains a stable coalition increasingly difficult. Staatz aptly states the problem.

> "...With a highly heterogeneous membership, particularly one in which the members perceive themselves as being in opposing camps, it may be difficult to get members to agree on anything other than running the cooperative as a separate profit center. ...The stockholders may be happy with the cooperative's performance in the same sense that an investor in an IOF is happy with his firm's performance. To the extent that the cooperative operates as a separate profit center, however, the potential gains to the cooperative's stockholders from the organization's broader scope for optimization are lost." (1984, p. 78)

This chapter will begin with a review of recent literature on cooperative pricing issues. This is followed by a discussion of additional issues facing the BCs in loan pricing, including a brief history of loan pricing practices and a discussion of recent legislation directly impacting loan pricing. A more specific framework for analysis will then be introduced, and an attempt will be made to consider potential cost components that would be relevant in considering BC pricing practices. The chapter closes with an overview of pricing practices currently used by the BCs.

A Review of Cooperative Pricing

Equal Versus Equitable Treatment

Many trace the beginnings of the modern cooperative movement to the Rochdale Pioneers in England. At the root of their beliefs was a basic concept of the cooperative as an "equitable association". They formulated a famous set of "Principles" that many continue to consider as the basis for modern cooperatives. These became embodied in practices such as one member-one vote, limited returns on capital, and the distribution of earnings based on patronage rather than equity holdings.

Cooperative enthusiasts extended this equitable view of cooperation to an egalitarian ideal meaning equal treatment of all members. This debate over the equal versus equitable treatment of members has been the stage onto which many cooperative issues, pricing among them, have been thrust. Nourse summarized the issue quite succinctly in an article originally published in 1946.

> "What is equitable in the economic world is a matter which cannot be settled by formal rules. It has to be worked out progressively by the best methods of social science as the actual process of technological growth and business organization presents us with new situations. Hence we, as architects of the cooperative form of business organization, must question our own minds sharply (and repeatedly as factors change) as to what equitable means as applied to our business relations." (p. 112)

The increasing heterogeneity of members is one of those changing factors that has brought many cooperatives to reconsider the practice of equal treatment of members with respect to the pricing of goods and services, in favor of an equitable treatment recognizing that benefits and costs associated with individual relationships vary a great deal. This pragmatic response to competitors has been manifested in differential pricing programs adopted by many cooperatives in recent

years. In terms of the coalition view, this change was necessary to insure adequate payoffs to retain member participation.

The practice of charging differing prices to members has generally been justified by the differing costs of providing the product to different members. Knutson refers to "pricing both supplies purchased and products marketed on the basis of equal net margins;" (p. 35, emphasis added) in response to an increasingly diverse customer base.

The issue of differing costs has become more apparent with the increasing importance of large members. These large volume members have found it beneficial to perform some of the traditional vendor services themselves, and in the more extreme cases are interested in only a wholesale relationship. They are unwilling to pay for additional services they do not want. In order to meet this need, differential treatment programs have been developed to more closely meet member needs.

A recent study pointed out that the differential pricing programs most widely accepted by members were those where the cost differences were fully reflected in the terms of the sale (i.e., equal net margin), while patronage refunds were declared on a more traditional equal basis. In addition, acceptance was better if all members had access to the various pricing options being offered, regardless of whether it was practical for them to make use of the options (USDA/ACS). This would lead us to believe that a thorough understanding of costs would be very important in establishing a differential pricing program.

Pricing and Stable Equilibria

The theoretical work done by Staatz (1984) and Sexton (1984a) using game-theory models also shows that charging the same price to all

members does not generate a stable equilibrium. In many cases the large member may have better opportunities available to them than the cooperative can provide under an equal pricing scheme, resulting in an incentive to defect. They go on to show that an average cost pricing scheme (as in Helmberger and Hoos) under a scenario of increasing average costs does not generate a stable coalition since there will be an incentive for some subgroup to defect and produce the good at a lower average cost.

These models suggest that differential pricing needs to reflect the member's impact on the cooperative's cost function and the member's strategic opportunities. Staatz discusses the development of a characteristic function that shows the minimum prices the cooperative must meet to prevent members from defecting. These minimum prices, or security values, could be estimated by collecting market information on the prices available to various member groups, adjusted for any transaction costs of shifting the business. This represents the upper pricing bound for avoiding member defection. The cooperative's break-even constraints would represent the lower bound to the core solution. However, within these two bounds the cooperative still must make decisions on the allocation of costs and benefits, the exact outcome of which will be a function of the bargaining position of the various participants.

Marginal Cost Pricing

Sexton (1984a, 1986) explored multipart pricing in the cooperative based on a marginal cost (MC) pricing system to attain maximum benefits (i.e. the greatest gross benefits to cooperation) under the less than

competitive market environment.[1] Since a surplus or deficit (k) will be generated if MC ≠ AC, an additional rebate or charge is needed to satisfy a break-even constraint, a problem the traditional average cost pricing scheme avoids. In the situation of nonincreasing MC, four allocation methods for k are investigated.

(a) Single-part pricing (or a uniform tariff): This alternative makes no use of an additional rebate or levy. It functions as an average cost pricing scheme, and would not be a part of the core unless MC = AC at that point, or members' demand functions were inelastic.

(b) Non discriminatory two-part pricing: An equal fixed charge (equal to k divided by the number of members) is levied on all members. In a heterogeneous membership this method is not workable since smaller members may not participate due to a negative pay-off.

(c) A benefit-based discriminatory tariff: In this case k is allocated to each member based on their proportion of the gross benefits received by all individual members. Gross benefits would be established by calculating individual member profit at the cooperative price less individual member profit at the alternative non-cooperative price. Sexton shows mathematically how this can be derived through the individual member input demand functions. This method would necessarily be within the core.

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[1] The citations include a full mathematical treatment of the results.

(d) A patronage-based discriminatory tariff: In this case k is allocated based on the units purchased by individual members relative to total member purchases. That is, k is allocated equally on a per unit basis (pro-rata). This may not lie within the core for all members. The difference between this and (a) is that member purchase decisions are based on MC, not AC, so the quantity purchased will be different.

Note that the member's elasticity of demand plays an important role in the results above. For the member with inelastic demand, the benefits of cooperation lie primarily in the lower price (price effect) with little shift in units purchased. On the other hand, members with elastic demand faced with a lower input price may rearrange their input mix (substitution effect) and/or expand production (output effect), increasing their total units purchased. As a result, for the member with elastic demand, the per unit benefit declines as units purchased as a result of cooperation increases, so the average benefit per unit purchased ends up being less for the member with elastic demand, even though the total benefit would be larger.

From this analysis we can expect that members with inelastic demand would prefer a patronage-based allocation since their benefits lie primarily in the lower price. However, members with elastic demand may object to this allocation due to their lower per unit benefit, in favor of the benefit-based allocation. However, it should be recognized that in an applied setting, the information requirements could be rather significant to establish individual input demand functions that are necessary for benefit-based allocation.

Cost Allocation in the Cooperative Versus the IOF

It naturally follows that cost allocation decisions carry somewhat different implications in the cooperative than in the IOF. Cooperative stockholders receive the benefits of ownership primarily through the use of the firm's goods and services, whereas IOF stockholder returns are not tied to patronizing the firm. As a result, the cooperative stockholder is much more interested in the income distribution consequences of cost allocation and pricing questions than in overall firm profitability per se.

This issue manifests itself in a much greater degree of concern over cross-subsidies within the cooperative than in the IOF. This may limit the cooperative's flexibility in responding to new opportunities that may require initial subsidies. For example, overhead costs allocated on a pro-rata share basis (i.e. proportionally) may result in times where a business activity appears unprofitable, yet the returns still exceed marginal costs. As a result, there may be pressure to eliminate this activity even though it still contributes to overhead coverage, although not its "share". In the IOF this issue may be easier to deal with since they are free to allocate costs in a more flexible manner, focusing primarily on overall profitability.

In the context of the earlier discussion on the theoretical views of cooperatives, the vertical integration approach appears to correlate closely with this concern over allocating costs as nearly as possible with the relevant business activity. Yet, it is obvious at this point that this task is not possible without a somewhat arbitrary decision over the allocation of overhead costs. The cooperative as a firm model

provides a framework that allows for the firm level decision, but effectively avoids the cost allocation question.

To look at a more specific example, Sexton and Iskow advocate a two part pricing scheme to generate a core solution. In this model members pay (receive) marginal costs (returns) for the good or service, but are also assessed additional annual membership charges to pay for fixed overhead costs. They suggest "To prevent free riding, the membership charges need to be roughly proportional to the member's expected patronage in the association." (p. 26) This sounds much like the Phillips argument. However, they go on to suggest as an alternative using a formula for fixed membership fees that encourage large producer participation by assessing them a less than proportional fee. This wavering position exposes the crux of many cooperative pricing issues: There often does not exist a non-arbitrary way to allocate overhead costs. It is in fact a matter of choice that is a central issue in maintaining the coalition.

With this background on views of cooperative pricing, it is now necessary to move more directly to the analysis of cooperative loan pricing and more specifically establishing a framework for analysis. In the next section the pricing issue will be brought into the context of cooperative lending within the BCs.

Loan Pricing in the Banks for Cooperatives

Prior to addressing the current pricing issues, some historical perspective on loan pricing will be presented. Pricing policies of the BCs have evolved as financial institutions and markets in the United States have changed since the original organizations were chartered.

Early History

Pricing began with a strictly administered rate structure, and has gradually moved to a very market-oriented rate structure. Through the Farm Credit Administration (FCA) the federal government has taken a very active role in the pricing practices of the BCs. While FCA's direct role has diminished over time, they still play a key role as the system's regulator.

Interest rates in the early years of the BCs were established by the Governor of the Farm Credit Administration, as authorized in the Farm Credit Act of 1933. The Act specified a minimum annual interest rate of 3% and a maximum rate of 6%. Rates on merchandising loans were to be 1% over the discount rate of the FICBs, the BCs' source of funding at that time. Facility loan rates mirrored the National Farm Loan Association (predecessor of the FLB) rates on farm mortgage loans.

The Farm Credit Act of 1935 included only minor changes in interest rates, although the minimum rate of 3% was dropped. Commodity loans were added with interest rates determined again by similar loans offered by the FICBs. During the late 1930s rates were set at 2% for commodity loans, 3% for operating capital loans, and 4% for facility loans.

Evolving Regulatory Control

During the late 1940s and early 1950s the Governor began to allow greater variation of interest rates among the districts. There was a recognition that the cost of loanable funds and operating costs varied between district banks. This movement continued as Congress authorized the BCs to issue consolidated debentures in the Farm Credit Act of 1954 to raise funds directly in the financial markets. The Farm Credit Act of 1955 gave the BC Boards of Directors authority to set their own

interest rates with approval of the Farm Credit Administration. The maximum annual interest rate of 6% on the unpaid principal balance was maintained.

District boards began to move towards relating interest rates to the term of the loan rather than the type of loan, as awareness of the cost of funds in the capital markets increased. Many of the banks also adopted variable rate loan contracts that allowed the interest rate charged to the borrower to be adjusted during the life of the loan (Whitney). On December 15, 1967, Congress dropped the interest rate ceilings, although rate changes still required approval of a bank's board of directors and FCA.

Other significant changes in the 1955 legislation were the capitalization structure, and distribution of earnings. The wheels were set in motion to capitalize the BCs with member invested capital, with the ultimate goal of completely transferring all ownership interests of the federal government to the members. In addition, provisions were made for the distribution of net savings to members in the form of patronage dividends. Prior to this legislation there was a stock purchase requirement tied to the level of member borrowing. However, the only dividends allowed were paid out as a percent of stock owned rather than patronage. The borrower's rate prior to this legislation need only be adjusted for stock purchase requirements to find an adjusted "cooperative price", while after the legislation the patronage refund could potentially have a much greater impact on the ultimate borrower rate.

The cost allocation question was also becoming a bigger issue. With greater variation in interest rates within the BCs, as well as the

increasing role of patronage refunds, the benefits received by individual members became more subject to the need for group choice within each bank.

The Current Situation

Underlying the early pricing rules is a traditional average cost pricing interpretation of cooperative principles with the same lending rate charged to all patrons on any given product. While many loans were adjustable rate notes, rates were adjusted infrequently due to fairly stable interest rates in the capital markets.

During the past 25 years the financial needs of cooperatives have grown substantially. In addition, capital markets have become much more accessible and competitive, and new financial instruments have been developed to provide alternatives for financing. Larger cooperatives became attractive prospects for the providers of these new instruments. Financial markets also became more volatile, which increased the impact of interest rate risk faced by both borrowers and lenders arising from dramatic changes in interest costs and the resulting economic valuations.

While all cooperatives were certainly affected by these changes, the largest ones probably felt the impact the most, and also were most aware of the impact of these changes on their businesses. The BCs became aware of the need to reevaluate their pricing policies as these loyal borrowers began raising concerns over new products that were available elsewhere, as well as other competitive sources of financing.

The increasing level of interest rates, in addition to increased market volatility, brought about expanded interest in fixed rate financing and other financial innovations. The traditional limited

product line based on average cost pricing no longer met the needs of all borrowers.

The BC's response to meeting these market conditions was largely an ad hoc system. The initial number of special pricings was limited, and these situations were simply dealt with as they arose. It amounted to a negotiated rate setting process for those borrowers who could potentially be lost to the competition. In many system institutions access to fixed rate financing programs was used as a form of differentiation based on borrower size, with some consideration for credit quality. Some institutions also implemented programs that differentiated borrowers with respect to credit quality on variable rate lending programs as well.

In recent years there has been a systemwide movement towards differential loan pricing. In fact, statements to this effect have been incorporated in systemwide and many individual bank planning objectives. The movement towards differential rates is also evidenced by the addition to the Code of Federal Regulations on November 30, 1983, of language regarding differential rates:

> "(d) Differential Rates. Differential interest rates may be established for loans based on type, purpose, amount, quality, funding or operating costs, any combination of these factors, or such other factors as may be approved by the Farm Credit Administration. Differential interest rate programs should achieve equitable rate treatment among categories of borrowers..." (Title 12, Chapter VI, Section 614.4321)

Competitive Pricing Mandate

The Farm Credit Act Amendments of 1986 eliminated the FCA approval requirement on interest rates. However, FCA was charged with more specific monitoring and post-review requirements that focused on market competitiveness and overall bank performance. The act provided

market-oriented pricing boundaries for the system to operate within through the addition of the following new subsection to the Farm Credit Act of 1971 (12 U.S.C. 2001):

> "(c) It is declared to be the policy of Congress that the credit needs of farmers, ranchers, and their cooperatives are best served if the institutions of the Farm Credit System provide equitable and competitive interest rates to eligible borrowers, taking into consideration the creditworthiness and access to alternative sources of credit for borrowers, the cost of funds, ..., the cost of servicing loans, the need to retain earnings to protect borrowers' stock, and the volume of net new borrowing. ...Provided, That in no case is any borrower to be charged a rate of interest that is below competitive market rates for similar loans made by private lenders to borrowers of equivalent creditworthiness and access to alternative credit."

In light of the cooperative theory previously discussed, this statute would appear to prohibit any pecuniary benefits potentially gained through cooperative lending. As a result, one of the following general cases must exist:

(a) There no longer exists a unique financial reason for the BCs to exist since they offer nothing different than the competitive alternatives.

(b) There exist non-pecuniary benefits for the borrower doing business with the BC. For example, member ownership/control and specialization within the cooperative business form may result in lending policies (e.g. repayment terms, loan maturities, conditions, specialized advice, etc.) that more closely fit borrower needs than alternative lenders.

(c) The intent of Congress was that "rate of interest" was in reference to the stated rate, so the patronage refund and stock participation would fall outside the statute.

(d) Through a combination of (b) and (c) the BC earnings would be higher due to better lending expertise in specialized areas and

improved coordination leading to lower loan losses than other lenders.

It would appear that at least (c) is true based on subsequent actions by FCA, the agency charged with interpreting and carrying out the statute. That is, in their monitoring activities, system interest rates are not adjusted to reflect the impact of patronage refunds.

Another problem with interpreting the statute is the ambiguous nature of interest rates as a total measure of borrowing costs. These occur as a result of loan requirements that impose additional costs on the borrower. Compensating balances and origination or commitment fees would be examples that vary greatly among other lenders, and between other lenders and the BCs.

Given this situation, the allocation of costs among borrowers takes on greater significance. Since the lending rate(s) can be thought of as being exogenously determined in the competitive market, the internal pricing decisions amount to a decision on the allocation of costs. This avoids the relevant question of how the appropriate competitive price is ascertained by either the BC setting the rate or the regulator. In this light, the next section provides some background on how other lenders have been considering the pricing problem.

Other Lenders and Loan Pricing

The evolution of BC pricing strategies appears to parallel efforts being made by other lenders. A recent issue of The Bankers Magazine included an article by the president of Loan Pricing Corporation, a firm that provides banks with systematic, competitive pricing information about commercial loans. This individual stated:

> "The change bankers must manage is to convert loan pricing from a case-by-case basis to a process. ...The pricing decision generally consists of the lending officer negotiating the best price he can get, then defending it before a committee or next level review. Other than a general hurdle rate, which is often viewed as unattainable by the line officer, the bank generally has no pricing standards tied to firm size, risk category, or other factors." (Snyder, 1987, p. 9)

Pricing has been largely standardized by participants in the mortgage loan market due to the need to market these loans into a common secondary market, thus a very conscious effort is made to accurately price the initial loans since the asset valuation for the lender is explicit. Commercial banks have also made some use of a profitability calculation on individual commercial borrowers to determine the return from that lending relationship. However, the focus is generally on overall profitability without specific consideration of loan pricing methods. In addition, a number of other service and deposit related items are considered in evaluating this relationship.

The risk-based capital concept mentioned earlier has also been an area of new interest in banking circles. Federal regulators of commercial banks proposed in 1987 that capital adequacy be evaluated relative to the riskiness of bank activities. Some asset categories would require more capital than others, and off-balance sheet activities would be considered. To some degree this is a return to the formula used for analyzing bank capital in the 1950s. It has been postulated that "[an] explicit tie between specific assets and capital will likely lead to an allocation of capital costs to the department responsible for that asset." (Humphrey and Humphrey, pp. 23-24)

While fairness between borrowers may not be as great of an issue for non-cooperative lenders, the concern about developing a meaningful pricing system is equally important. Pricing research indicates there

is systematic pricing variation across the portfolios of many banks by size and risk of borrower, industry and location, type of loan, purpose of loan, and many other factors. However, the research also indicates that bankers are ineffective pricers and price negotiators, so there is a real incentive for borrowers to shop around. In some cases loans to nearly identical borrowers can vary widely in pricing (Snyder, 1988). This would seem to make the regulator's role exceedingly difficult in measuring the competitiveness of BC rates. The more accurate measure may be the BC's ability to retain its customer base over time.

Developing a Method of Analysis

In developing a method of analyzing BC loan pricing it is necessary to synthesize what the theory offers in a manner that can be used in a very applied environment. In this section some of the problems encountered in making this transition will be presented, followed by a proposed approach that should provide for the use of the theory in this setting.

Problems in Analysis

Two major problems exist in making the transition to applied analysis. These problems center around multiple product rather than single product cooperatives, and complex product composition.

a. Multiple Product Organizations

Most theoretical pricing discussions are undertaken in the situation of a single product firm, rather than the typical multiproduct firm. This would still not pose a problem if costs could be allocated between products in a non-arbitrary manner. However, whenever overhead costs are present, it is not possible to allocate costs in a

non-arbitrary manner since they cannot be tied directly to any particular unit of business by definition.

There also exist practical limitations to the extent that costs can be traced back. The advent of the computer age has greatly increased the ability of firms to understand their cost structure at a significantly lower information cost. However, limitations in this area continue to exist, if for no other reason than our limited ability to understand very complex cost structures.

A third problem arises due to the growing heterogeneity of members. While a very large and a very small borrower both require financing, the specific type of product (e.g. loan conditions, degree of flexibility, amount of service) may vary greatly. These borrowers are also likely to face very different competitive alternatives for financing.

b. Complex Product Composition

Products (or output) also tend to be a combination of many different inputs, whose individual cost functions may differ significantly in their nature. For example, some factors may reflect significant economies of scale in production or purchase, while others do not. The acquisition cost of some factors may be stable, while others exhibit much more volatility.

Given the differences in the characteristics of component cost functions, it would seem prudent to decompose costs in a fashion that provided for individual analysis of costs with similar characteristics. Some cost categories may also lend themselves to easy identification with the final unit of output (i.e. predominantly variable cost), while the nature of others may represent more of a mix of fixed and variable costs.

These two general problems lead to the sharing of costs by cooperative members. In some cases it is by necessity since direct costs cannot be traced to the output; and in other cases it results from a decision to share costs among groups of members. A means for dealing with this is the next topic of discussion.

Sharing Costs - By Choice and By Necessity

Pooling is a uniquely cooperative practice for sharing costs among members. A pool essentially serves as an accounting center for aggregating and then distributing costs and benefits among cooperative members. Most often the concept of pooling is explicitly used by specialized commodity processing and/or marketing cooperatives; yet it is implicitly used by all cooperatives.

In the traditional marketing pool, members turn over their production to the cooperative to be commingled with the production of other members. Expenses the cooperative incurs are charged against the pool, and the proceeds from commodity sales are credited to the pool. Once the pool has been liquidated the member receives a final payment based on the proportion of the total pool that was contributed. It amounts to the averaging of all benefits and costs among pool members, essentially an "equal" treatment of all members.

Pools take on many shapes and forms. McBride refers to a contract pool as one where prices are determined on an individual basis, but expenses remain pooled as before. This essentially describes the functioning of a basic farm supply cooperative. Members purchase inputs at an initial stated price, then all expenses are charged against the accumulated revenues for the fiscal year, and the member receives a patronage refund in proportion to the amount of purchases for the year.

The pooling period is one year, after which costs are averaged and charged against the revenue generated on an equal per unit (or per dollar) basis.

Up to this point in the discussion the cooperative has been considered a single pool, but this need not be the case. Multiple pools are frequently maintained within cooperatives for "similar" products. Common examples include commodity, geographic, or use separation in marketing cooperatives; and departmental separation in supply cooperatives.

Pooling amounts to an averaging of costs and/or revenues among a group of members. It is a pragmatic response of cooperatives that recognizes the real world constraint that at some point members will be grouped and an averaging process takes place. Pooling may be used selectively with respect to specific costs or revenues, but will inevitably happen at some level within the cooperative.

The presence of complex costs and multiple products within the cooperative makes pooling a necessity even within the marginal cost pricing system outlined by Sexton. Pooling creates manageable boundaries for analysis by decision-makers. Some additional reasons for using pooling include:

a. Accounting Simplicity

As stated in a Touche-Ross publication on pooling, "Given a multi-department, multi-commodity supply or marketing cooperative operation, the achievement of absolute, finite equity in the treatment of each individual patron would be a literal impossibility." (p. 46) Accounting costs would be prohibitive (if not altogether unworkable) if the business with each member were completely segregated to reflect a

true "vertical integration" in cost allocation. One of the advantages of cooperative action, especially for smaller members, is the advantage gained through handling large lots. For example, it would be impossible for a processing cooperative to function without the combining of individual member production into large lots. Likewise, the farm supply cooperative that only purchased inputs individually for resale on an individual member basis would be quite unworkable due to the small lots, similar to the BC situation in issuing larger denomination bonds. These might be considered physical limitations that necessitate pooling.

It should be noted that this limitation can vary greatly between large and small members due to economies in separation. The economical purchasing amount for a supply cooperative may be at a level equivalent to a large member's needs, but would require substantial division into smaller units for a small member.

The other accounting reason for pooling costs has to do with the existence of joint or overhead costs. Even with the best accounting system, overhead costs cannot be allocated in a non-arbitrary manner since they cannot be traced directly to a particular unit of output. One arbitrary allocation rule chosen is to pool costs and distribute them on an equal basis. A slight variation of this rule is to establish a number of groups (or pools) of members among whom overhead costs are allocated in an unequal manner, for equal pooling within the subgroup. In this frequent situation the subgroup boundaries and arbitrary general allocation rule are critical matters of group choice.

b. Reduction of Risk

Pooling achieves more stable results for group members by averaging out variations in price. This may include pricing fluctuations over

time, and with respect to other product attributes such as size and quality. It amounts to a diversification strategy of risk reduction. As an example, the traditional marketing pool reduces the day-to-day risk of price fluctuations faced by producers since pricing of all sales over a period of time are averaged. While reducing the probability of receiving a very low price for production (or alternatively paying a high price for inputs), it also limits the potential individual gain from favorable price movements.

Risk reduction can also be achieved through the greater expertise possessed by specialized pool managers. Through superior market knowledge pooled outcomes may achieve more desirable results than the average of individual actions would have. In some cases, pooling may also provide greater market power yielding more favorable prices.

c. Redistribution of Income

Pooling may serve the function of redistributing income among a group of members by choice. In this case some other ideological or social incentive must exist to hold the cooperative coalition together. An example might be where both regional and local cooperatives patronize the BCs, the larger regional organizations might accept an income redistribution effect since local cooperatives are necessary for their long term survival, so they have an interest in seeing that the locals are well-financed. This is a key area where traditional cooperative ideology expands the core that may be stable.

Pooling is often a means of insurance over time. That is, one commodity or enterprise may not do well in a given year and pooling smooths these fluctuations out that cannot be predicted ahead of time.

Voluntary and Mandatory Pool Participation

Pools are used both explicitly and implicitly within cooperatives. Organizational papers may dictate specific pooling practices for commodities. They may also dictate the cost allocation method between individual pools for the more ambiguous overhead costs. However, most frequently management and boards have significant control over cost allocation procedures within the prescribed pools. In contract pools the power to establish differing prices for pool participants upon initial participation is generally in the hands of management, and occasionally the board. Their decisions on pooling practices are critical to holding the coalition together.

In some cases pools may be voluntary rather than mandatory. As will be investigated later, BC members traditionally borrowed funds at fixed or variable rates. The election of the variable rate resulted in the loan being included with other variable rate loans for funding over time as a pool. On the other hand, large fixed rate loans may be funded directly by a specific debt instrument. Within some administrative constraints, the choice to pool was the borrower's.

Some cooperatives also allow non-patronage business, where it is understood that no patronage refund will be paid on the transaction. This is a choice not to participate in the patronage pool of the organization.

The pooling option provides a unique means for cooperative members to share in costs and revenues. Not only is there a choice to be made in the boundaries for pooling, but also in the choice to participate or not (or to allow such a choice). Flexibility in pooling practices has been one of the ways that cooperatives have attempted to deal with the

problems of heterogeneous memberships. The coalition model of the cooperative provides valuable theory in attempting to determine what choices will be made in order to keep the coalition together.

Methodology and Terminology

The pricing practices of the BCs will be looked at in a component pricing framework, analytically considering individual components separately. Given the cooperative nature of the BCs, cost allocation among members with respect to each component will be considered in an effort to better understand the implications of how costs and benefits are allocated among members. While the nature of the analysis looks primarily at BC cost allocation, the practices of other lenders will be brought in as necessary since the BC is mandated by both Congress and the market to price in congruence with competitive alternatives. While the cost structure is but one component of how interest rates are determined, it is probably the most important.

The extent to which pooling is used to share costs will be a key part of the analysis, including the use of multiple or differential pools for sharing costs. The relationship between these practices and marginal cost pricing schemes will also be considered.

The specific use of the terms marginal cost and average cost in this study warrants some clarification. The economist's concept of marginal cost is the additional cost the firm incurs to produce one more unit of output. In an existing firm where the output is already being produced the determination of the marginal cost of existing production levels becomes more difficult. What is to be considered the last unit? As a result, what may be more accurately called costs attributable to a

given unit of production are relied on as a measure of marginal cost, since the cost would presumably not be incurred if the specific unit of product or service was not provided. The case where this can truly be tested is when a completely new loan is made, thus identifying the last unit. The attributable cost will be considered as the marginal cost in this study since it is this type of information that is used in practice for decision-making.

The economist's concept of average cost is calculated by dividing the firm's total cost at various production levels by the number of units produced. In this study the term average cost is used in a more limited sense when considering specific costs that are shared equally among a group of users rather than charged to the transaction they can be attributed to. In this sense the term average cost is limited to both the particular type of cost being discussed and those that can be attributed to a particular group of transactions (i.e., marginal costs as discussed in the prior paragraph).

Cost Structure Components

The cost structure will be considered as four primary components in turn:

- the cost of debt funds to finance the loan,
- operating expenses,
- the cost of compensating for credit (or default) risk,
- and patronage refunds allocated to members.

Patronage refunds are included since they represent the extent to which the cooperative's revenues exceed costs. In the cooperative pricing context this represents a rebate (or potentially an assessment) to members, adjusting their initial price.

The next four chapters are dedicated to analyzing these four components individually in depth.

Overview of BC Pricing Programs

In order to better understand the chapters that follow, an overview of the pricing methodology found in most of the BCs is helpful. Following is a very short summary that outlines the general framework used by the BCs in pricing.

In general, a goal of most banks is to price in line with competitive market rates. However, it would be very difficult to administer pricing that attempted to meet this goal on a loan-by-loan basis. Rather, most BCs have developed "tier" systems that provide a means for categorizing borrowers into different groups for pricing purposes. This movement started in 1971 when the Springfield BC implemented a tier system, but was not adopted on a broader scale until the late 1970s and 1980s. In addition, some borrowers may have loan rates that are individually negotiated since they cannot be accommodated by the tier system. The development of criteria and groupings for these tiers is much of the concern of the chapters that follow.

The BCs vary as to how these tier systems are specified and how broadly they are used. Some banks have only a single pricing group (i.e. single tier) and use individually negotiated rates where necessary to retain borrowers. Other banks have more complex systems with a greater number of pricing categories in an attempt to avoid individually negotiated pricing. Table 3.1 provides an overview of the general pricing system used in each district and the CBC. Note this breakdown is estimated by number of borrowers, not volume. The individually

negotiated volume would be substantially greater since it includes the largest borrowers.

In terms of the component pricing approach already introduced, the tier systems typically are applied to the spread between the cost of funds and the stated interest rate. That is, there are two primary components - the cost of funds and the spread. Spread pricing necessarily includes the three remaining components: operating costs, credit risk, and net savings (earnings). However, the spread breakdown is often less transparent since its components are not applied individually, but as a group. As a result, the analysis of the cost of funds pricing can be much more explicit than the chapters that follow it. In addition, many complex products are offered.

Table 3.1. Summary of Spread Pricing Methods.

District	Individually Negotiated	Tier System (# of Tiers)	Single Pricing Group
	- - - - - Share of Customers by Number - - - - - -		
SPRINGFIELD -	10%	90% (3)	
BALTIMORE -		All (3)	
COLUMBIA -	14%		86%
LOUISVILLE -	Minimal	Most (3)	
JACKSON -	10%		90%
ST. LOUIS -	Few	Fixed rate products only (5)	Variable rate products only
ST. PAUL -	10%	90% (6)	
OMAHA -	2%-3%	97% (4)	
WICHITA -	10%		90%
TEXAS -	None	Fixed rate products only (3)	Variable rate products only
SACRAMENTO -	80%-90% of Volume based on targeted spread		Remainder
SPOKANE -	3%	97% (12)	
CENTRAL BANK -	Virtually all		

Source: District banks

CHAPTER 4

COST OF FUNDS ALLOCATION

The cost of funds is by far the largest portion of the costs allocated to the borrower, comparable to the cost of goods sold in a retail firm. It is also the most volatile of the cost components, but the one with the most available market information and external risk reduction tools.

The choice of the cost allocation rule employed has a substantial affect on the borrower's interest rate. When the pricing rules are vastly different, a comparison of interest rates alone is only a partial (and sometimes misleading) analysis. The basis for future pricing, and the ultimate effect of pricing rules on earnings, thus patronage refunds and effective rate, become a critical part of the analysis.

The first portion of this chapter is dedicated to describing the cost of funds component, and tools that are commonly used in its management on an organizational level. The implications for pricing rules are then considered at the loan level. Some alternative pricing options are then suggested.

Cost Characterization

Funding Sources

The primary source of funds for the BCs is the sale of consolidated system-wide bonds and discount notes. These instruments are issued on behalf of the entire Farm Credit System by their fiscal agency in New York City, the Farm Credit Banks Funding Corporation, through a nationwide system of securities dealers. Bonds are sold with maturities ranging from 3 months up to 20 years, and discount notes are issued with maturities ranging from 5 to 365 days (General Accounting Office).

The main function of the fiscal agency is to establish and maintain a system of securities dealers through which to market the debt instruments. The securities dealers receive a concession when bonds are initially sold to facilitate issuance, and guarantee to make a market for all issues.

Prior to 1979 each of the three branches of the Farm Credit System issued their own securities through the fiscal agency, but in the mid-1970s joint obligation bonds of all 37 system institutions were initiated. The move was intended to provide a sounder base for the bonds by backing them with a larger pool of equity capital. It also provided for more flexibility in maturities for individual banks (Penson and Lins).

Under the current arrangement each system institution essentially orders notes and bonds through the fiscal agency based on their own needs, but within the framework of a jointly agreed upon issuance calendar. As a result, the fiscal agency provides the mechanism for all system institutions to collectively access the financial markets, but individually decide on their own funding needs.

Farm Credit System securities are considered as agency issues of the United States government. They have historically carried rates slightly higher than Treasury securities of comparable terms. As a government-sponsored enterprise (GSE) they receive favored regulatory treatment and are a common investment for commercial banks and other financial institutions. The benefits enjoyed by GSEs are summarized in Table 4.1. GAO indicated that during 1985 comparable A-rated corporate bonds sold at margins of 200 to 300 basis points (100 basis points = 1%) above Treasury rates, while GSE bonds consistently sold for less than 50 basis points over Treasuries. The strong secondary market has also been a positive attribute that has provided for lower interest rates.

With the financial difficulties of the Farm Credit System the spread between FCS and Treasury securities has fluctuated dramatically. During 1985 the system's financial problems began to affect their cost of funds in light of the depressed agricultural economy. The average spread over Treasuries on total bond financing activity through July 22, 1985 was 5 basis points, but averaged 55 basis points for the remainder of the year. Spreads reached 100 basis points for some specific issues in the fall of 1985 (GAO). The passage of amendments to the Farm Credit Act in 1985 and 1986 to show support for the system, and subsequently the Agricultural Credit Act of 1987, once again brought the spread to a more stable level. However, the 1987 legislation also added a requirement for a bond insurance fund to guarantee payment, very similar to the FDIC insurance fund. This specific issue will be reserved for discussion in Chapter 7.

Although the BCs themselves are quite sound financially, the cost of funds is influenced by the condition of the other banks in the Farm

Table 4.1. Benefits Enjoyed by Government Sponsored Enterprises.

Type of Benefit	Farm Credit System	Federal Home Loan Bank	Federal Home Loan Mortgage Corporation	Federal National Mortgage Association	Student Loan Marketing Association
Line of Credit at Treasury	Yes	Yes	Yes[a]	Yes	Yes
Exemption of corporate earnings from Federal income tax	Yes[b]	Yes	No	No	No
Exemption of interest income of investors from State and local income taxes	Yes	Yes	No	No	Yes
Eligibility for Federal Reserve open market purchases	Yes	Yes	Yes	Yes	Yes
Equal Standing with Treasury debt as investments for most banks	Yes	Yes	Yes	Yes	Yes
Exemption from SEC registration and various State banking laws	Yes	Yes	Yes	Yes	Yes
Eligibility as collateral for public deposits	Yes	Yes	Yes	Yes	Yes

[a]Indirect line of credit through the FHLBs.
[b]FLBs, FICBs, and FLBAs.

Source: General Accounting Office, p. 64.

Credit System as well. As of December 31, 1987, BC systemwide bonds and notes totalled only $9.9 billion of the $40.8 billion of consolidated systemwide debt outstanding, with the vast majority held by the FLBs. While the BCs have had to endure higher funding costs due to negative FLB and FICB performance in recent years, this needs to be weighed against the economies gained through the system's large debt issuance base.

External funding is also generated through commercial bank lines of credit and other private lenders. In addition, a small amount of funds are generated through Farm Credit investment bonds sold to members. However, the majority of funding is generated through the sale of systemwide securities.

Given these funding sources, the cost of funds represents a rather homogenous commodity with easily distinguished attributes. Funding instruments carry a maturity date and a specific dollar value set at the time of issue. In addition, the secondary market provides an efficient means for valuing funding instruments at any future time for pricing decisions. The cost of funds is probably the most easily valued cost component, yet the more pressing questions center on the choice of maturities in funding decisions, and how the costs will be allocated among borrowers. Addressing these issues on an organization-wide basis will be the subject of next concern.

Asset-Liability Management

Asset-liability management (ALM) is an organization-wide balance sheet evaluation technique used extensively in financial institutions. A financial institution such as the BC has a balance sheet made up primarily of financial assets, as shown in Figure 4.1. Their assets and

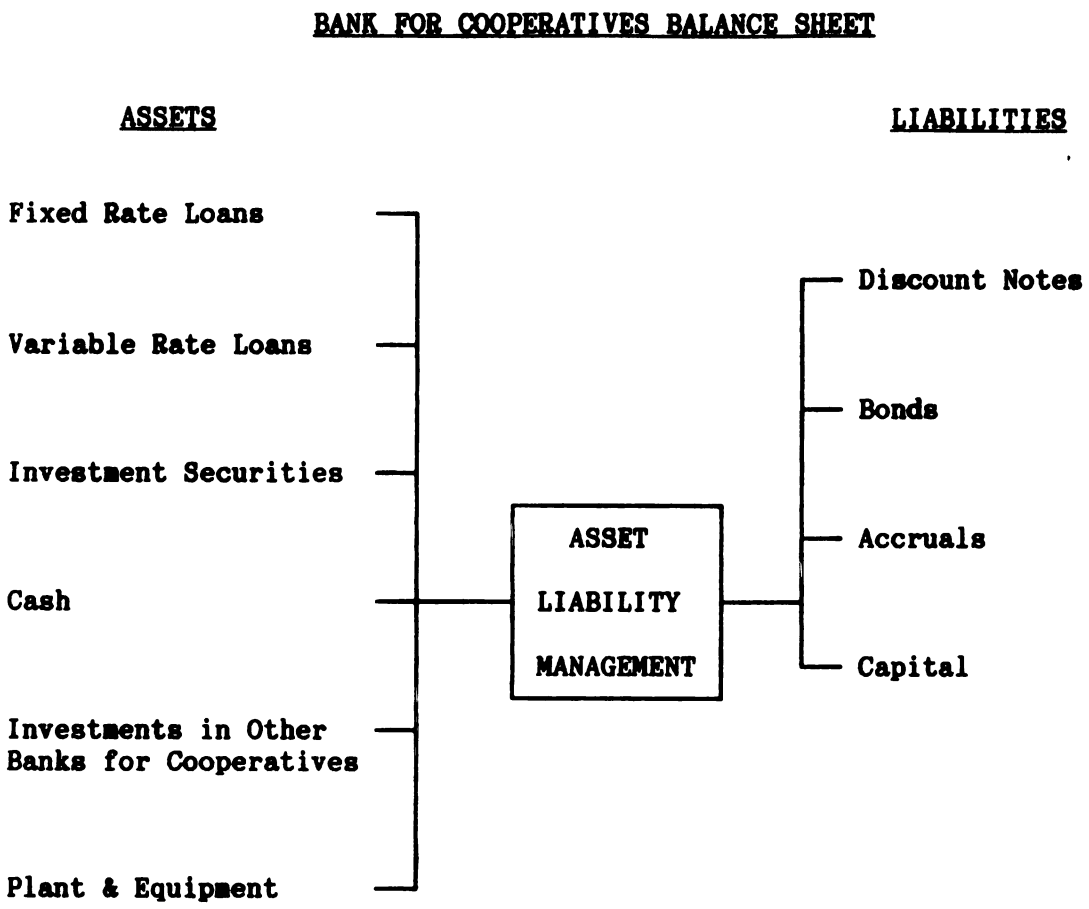

Figure 4.1. Illustration of Asset Liability Management.

liabilities have easily identifiable pricing and maturity attributes, with many subject to fluctuations in value as interest rates change. Brick defines ALM as "joint or simultaneous management of both assets and liabilities for the purpose of monitoring and controlling interest rate risk, profitability, and liquidity." The two main risks encountered are credit risk and interest rate risk. The subject of credit risk is reserved for Chapter 6, while the issue of interest rate risk will be addressed more specifically at this point.

Interest rate risk is intimately tied to a phenomenon known as the term structure of interest rates. This well-established concept of finance is often illustrated in a graph that plots the percentage interest rate against the maturity of debt for a given institution at a single point in time. The most frequently used institution for this purpose is the U.S. government, which issues a broad range of securities that are traded in a very active secondary market, and thus provide an easily plotted data set. In addition, these securities are considered a good measure of the interest rate on a risk-free debt instrument. The shape of this curve is typified as upward sloping, but exhibits fluctuations in both its shape and relative position over time. As a result, the maturity component of financial instruments issued to finance assets is not a benign issue.

The three basic approaches put forth to address the ALM question will be discussed below.

a. Gap Analysis

This approach focuses on the frequency with which assets and liabilities come back for repricing. The objective is to consider how well the repricing periods for assets and liabilities are matched. A

practical method for using the approach is to look at various maturity buckets (or tranches) of assets and liabilities that include all items subject to repricing within the specified time frame. By comparing these two values, management can determine the extent to which the institution is sensitive to changes in interest rates within that period. For example, a positive gap within the zero to 30 day range would indicate that the organization has more assets being repriced than liabilities during the coming 30 days. As a result, a drop in interest rates would lead to a drop in income as the excess repriced assets earn less than they previously had.

There exist a number of alternatives for dealing with the financial consequences of a funds gap. The most common approach is to "manage" rate sensitive assets and liabilities to more closely match repricings and reduce interest rate risk. This option is most viable for large institutions that can more easily vary their mix of purchased funds.

A second alternative is to use financial futures to hedge balance sheet accounts subject to unmatched repricings to reduce the effect of interest rate sensitivity on earnings. A conventional strategy to cover a positive funds gap resulting from more assets repricing than liabilities in a given time period would be to buy futures contracts to cover the gap. Interest rate risk in the "cash" market is hedged, in exchange for somewhat more predictable basis risk in the futures market. Banking regulations restrict use of the futures market for speculating on interest rate fluctuations, but do allow for defensive risk avoiding measures.

The third alternative would be to use an interest rate swap. For example, one institution may currently hold floating rate liabilities

that reprice frequently and longer term fixed-yield assets in its portfolio, while another institution may be in the opposite position. A swap arrangement has the effect of exchanging the cash flow requirements on the liabilities so that each institution can more closely match their asset repricing structure (see Pederson and Maginnis).

Since the most actively traded financial futures contracts are of relatively short maturities, their use becomes somewhat limited in ALM. However, interest rate swap contracts are becoming an increasingly used tool since they usually carry maturities of 3 to 10 years.

It should be noted that the existence of interest rate swap agreements, as a number of the BC annual reports indicate, has an impact on the effective bond maturities for repricing purposes. That is, the notes to the financial statements indicate the maturity of systemwide bonds by one year groupings, in essence their "cash" position, but a swap could substantially affect the actual repricing characteristics of these liabilities. It appears that many of these swaps have been between Farm Credit entities, often providing a BC with fixed rate funding and an FLB with variable rate funding.

b. Duration/Immunization

The duration of an asset is determined by finding the average time in years necessary to receive the present value of all future payments, including both interest and principal, discounting each cash flow at the current market yield. The duration would equal the maturity of a market rate zero coupon bond at issue since all cash flow is received at the maturity date and discounted at the current market rate. However, where there are intermediate cash flows, as in most loans and bonds, the duration will be shorter than the maturity.

The duration approach provides a single value for the asset, its average maturity at current market rates. A portfolio could be said to be immunized when the duration of its assets and liabilities are equal, so any parallel movement in the yield curve would have a like effect on both sides of the balance sheet. One major problem with this approach is that it requires that the yield curve move in a parallel fashion since the duration calculation requires an implied interest rate by which to discount each time-dated cash flow. As a result, a shift in the yield curve shape could substantially change the duration (Ballarin).

An alternative approach within this general framework is to solve for the current market value (i.e., the NPV of all future cash flows at current discount rates) for all assets and liabilities. The difference between the current market value of the assets and liabilities provides a measure of the company's net worth. Sensitivity analysis can then be done to evaluate the impact of various interest rate scenarios on the company's implied net worth. This provides an empirical means of measuring the potential risk of various strategies, but does not directly manage interest rate risk.

c. Management Science Techniques

This approach relies on sophisticated models and mathematical techniques to analyze the complex interrelations between the various components of the balance sheet and income statement. An objective function is specified with endogenous decision variables and constraints, and then maximized to lead to a single optimum solution (Reed, et.al.).

Some of the problems of this approach center on the reliance on many assumptions in order to specify the model. While the sophisticated model may take into account many variables, it is difficult to explicitly model the total organization accurately in a continually changing environment.

In much of the discussion that follows the gap method of analysis will be implicitly used. When properly specified it has been a very useful ALM method and fits intuitively well with the cost of funds issue when it is brought down to the individual loan pricing level, a necessary part of this analysis.

Gap Management Within the BCs

Gap management at the organizational level in the BC makes a difference for the borrower beyond the stated rate it implies for loan pricing. The BC's sensitivity to changes in interest rates will have a direct impact on profitability. As such, since the BC allocates its earnings back to its members, the effective borrower rate (adjusted for patronage dividends) is influenced by organizational interest rate sensitivity.

Table 4.2 shows a gap report for each of the 12 districts and the CBC as of December 31, 1987. Note that the maturity ranges have been separated into three categories for analysis. Also shown in Figure 4.2 is a graphical analysis of the gap position of all BCs. This table measures the gap as a percentage of total assets to give a more accurate basis for comparison between institutions. Recognize that since each of the BCs are independently managed, their gap position is a function of the given institution's ALM policies.

Table 4.2. Net Interest Sensitivity Gap, December 31, 1987.

District	Within One Year	One to 4 Years	More than 4 Years	Total Assets
		($ Thousands)		
Springfield	(1,845)	740	1,105	186,103
Baltimore	360	(1,099)	739	80,384
Columbia	12,157	(2,971)	(9,186)	353,405
Louisville	48,558	(46,710)	(1,848)	495,042
Jackson	(75,713)	1,107	74,606	475,063
St. Louis	48,453	(58,766)	10,313	395,547
St. Paul	(56,800)	19,300	37,500	1,215,361
Omaha	67,281	(43,983)	(23,298)	438,819
Wichita	(3,739)	15,348	(11,609)	644,103
Texas	41,064	(19,031)	(22,033)	440,187
Sacramento	(11,792)	(36,967)	48,759	514,938
Spokane	17,234	(19,028)	1,794	271,308
CBC	(239,144)	163,664	75,480	5,997,691

Source: Special Committee on BC Structure, Exhibit 3, Chart 18.

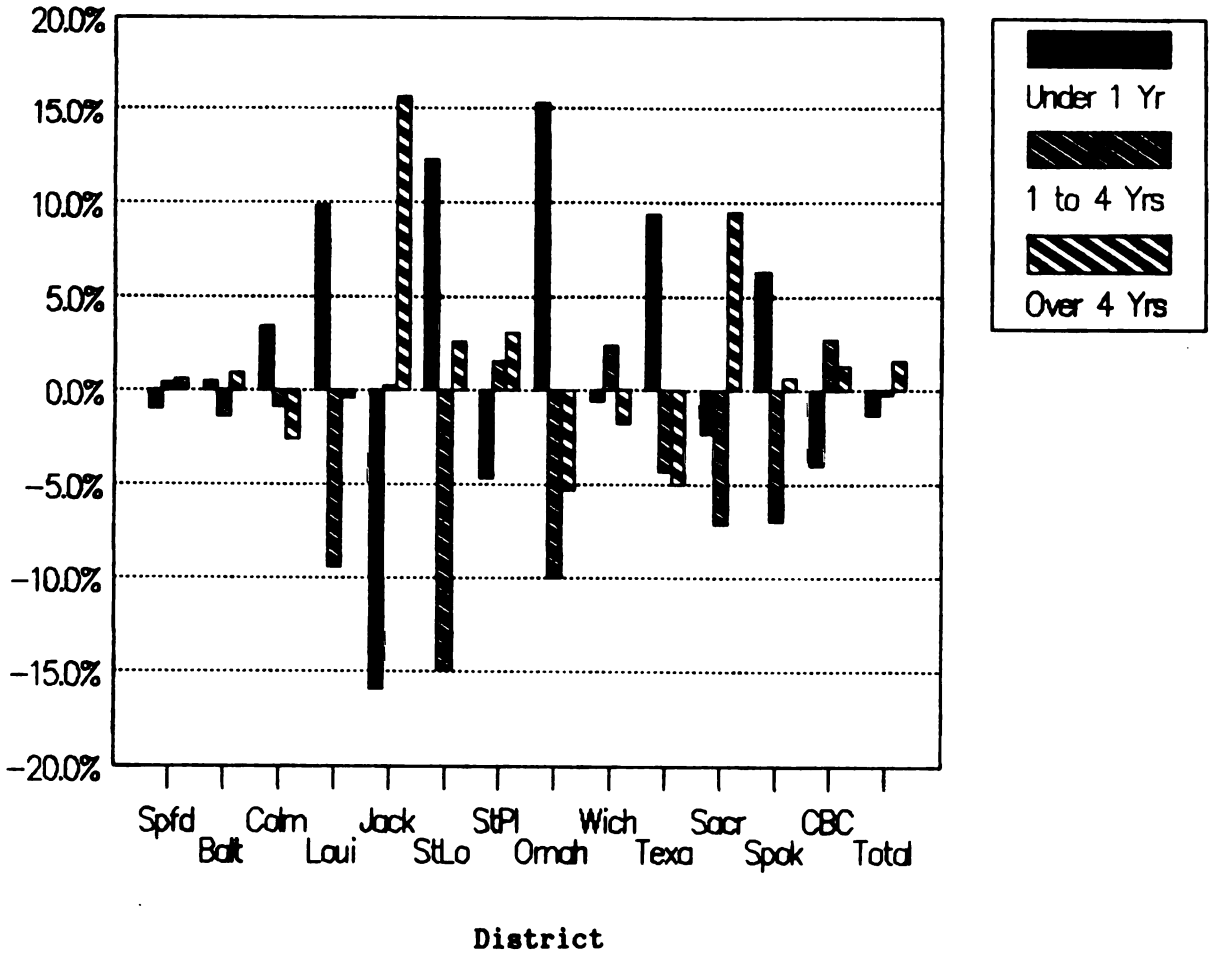

Figure 4.2. BC Gap Positions as a Percent of Total Assets, 12/31/87. (Special Committee on BC Structure, Exhibit 3, Chart 18)

The interest sensitivity equals zero when all three periods are summed, as it must when all future repricing is considered as one time period. As a result, an organization such as the CBC has a fairly high dollar amount of liabilities repricing within one year as compared to the amount of assets repricing within the same time period. However, this is done at the sacrifice of having a greater amount of assets repricing in the following two maturity periods.

It is impossible to identify an ideal gap position apart from the goals of the organization. If the organization's goal is to eliminate as much interest rate risk as possible, a gap position as close to zero in all maturity periods would achieve the desired result. The Springfield BC's position would be an example. However, other decision rules would emphasize the organization's financial knowledge of what movements in interest rates are anticipated. For example, with an upward sloping yield curve management may find it beneficial to have a negative gap position in the near term maturities and a positive gap position in the more distant maturities. The reason for this is that longer term assets have a higher yield in the positively sloping yield curve relative to short-term assets. By distributing repricing in this manner the organization is taking advantage of the slope of the yield curve to improve their return on assets. However, they do so with the risk of additional interest rate fluctuations that may reduce their profitability should the shape of the yield curve shift. Note St. Paul and the CBC as examples.

An equally important issue in looking at gap analysis is to ascertain the reason that the organization's gap position exists. In some cases it may be directly the result of a financial management

position taken by the organization, as suggested above. In other cases, it may be a function of varying asset levels with respect to funding obligations. More specifically, a bank may have taken out longer term debt instruments to finance term loans that were subsequently repaid much earlier than anticipated. The prepayment results in a significant increase in currently repriced assets with no change in the repricing structure of liabilities. As a result, their gap position in the near term would move in a positive direction while their position in the longer term would move in a negative direction unless a specific strategy was taken to minimize this gap shift. This appears to be the case in Omaha and a number of other districts that have shown declining trends in term loan volumes.

While the gap report gives some understanding of the organization's total interest rate sensitivity, it does little to explain the interest rate sensitivity of individual members or groups of members within the organization. In fact, depending on the original pricing practices, the bank as a whole might show a minimal amount of interest rate risk (i.e. a small gap position for all periods), while groups of borrowers within the organization are subject to rather significant amounts of interest rate risk. This is also illustrated when the total BC position is compared to individual districts in Figure 4.2. As a whole their gap position is quite close to even, but individual BCs have a great deal of interest rate risk exposure. This point becomes even more evident where the issue of economies of scale in the cost of funds management is considered.

Cost of Funds Management

While all banks within the Farm Credit System have access to funds through the fiscal agency, they also have the choice of participating or not in each issue. As a result, the cost of funds of individual BCs varies significantly. Figure 4.3 shows the average rate of interest on interest-bearing liabilities for each of the 13 BCs for 1987. The cost of funds ranged from a high of 8.61% in the Omaha district, down to a low of 6.52% in the Texas district.

The study by Hopkin, et.al. indicated that the CBC had more than a 50 basis point lower cost of funds than the average of the districts. While there is no refined way to explain these differences in the cost of funds, the study suggested there were some economies to be gained through a larger portfolio such as the CBC's. It went on to state that this was due to more specialized personnel in the larger operation and greater flexibility in matching specific funding needs with money market offerings due to their generally larger demand for funds.

One of the problems of directly comparing the cost of funds between institutions as in Figure 4.3 relates to the earlier discussion of interest rate sensitivity. The absolute comparison of interest rates tells little about the maturity of debt issues and how well they are matched with individual asset pricings. The Hopkin study noted that the CBC portfolio and one of the districts had much shorter loan portfolios than the other districts that would account for some of the difference with the positively sloped yield curve that predominated over the time period analyzed. This still leaves the question unanswered of how the corresponding assets were priced.

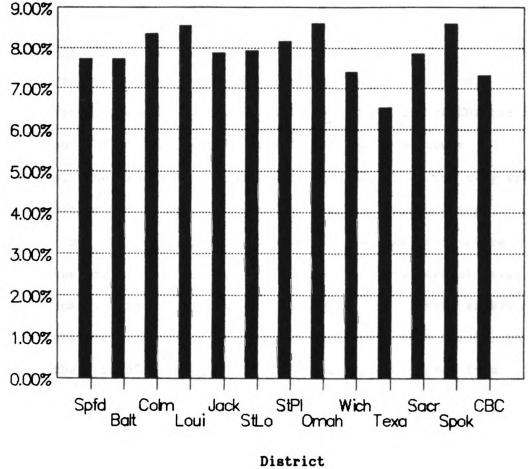

Figure 4.3. Average Interest-Bearing Liabilities, 1987. (Special Committee on BC Structure, Exhibit 3, Chart 16)

While the discussion to this point has offered some enlightenment on the importance of ALM to reduce interest rate sensitivity implications on profitability, thus to the borrowers as a whole through patronage allocations, this analysis also needs to consider how individual loans are priced within the organization. That is, how the cost of funds is allocated between borrowers.

Competitive Pricing

Little has been said to this point on the need to maintain competitive pricing of the cost of funds. As pointed out in Chapter 3, one dimension of the cooperative's core is defined by borrower alternatives. The practices of competitors are important not only to maintain business volume and compliance with competitive pricing regulations, but competitor practices also must be understood since interest rates are not normally quoted in a bidding environment (i.e., where the bank is responding to an initial quote from someone else), but that a competitive quote needs to be given up front. As a result, to the extent that the BC pricing rules differ to a great degree from competitor pricing rules, their rate may be unrealistic to begin with. The next section focuses more directly on how the individual loan pricing decision is addressed.

Individual Loan Pricing Options

One of the principal provisions in any loan contract is the way that the loan will be priced. Specifically, is the interest rate fixed or can it be adjusted? And if the rate can be adjusted, at what frequency is adjustment allowed and what is the basis for adjustment? In addition, are there any restrictions or penalties for prepayment?

As has been already pointed out, the big issue for the lender in ALM is not so much the maturity date of the loan, but the repricing date of the loan, to the extent that it is more restrictive than maturity. The repricing date of the loan is a function of provisions stating both the interest rate and repricing frequency, but also penalties assessed for early payment that determine the degree that repricing provisions are enforceable. However, the repricing rules generally say nothing directly about how the interest rate is established (i.e., the internal cost allocation rule).[1] This is a matter of internal practice established typically by management.

Cost of Funds Calculation

Cost allocation does make a difference in the cooperative. Other lenders may determine they lost money on a deal and it affects the rate of return for the organization, however, it does not affect the borrower's rate directly. In the cooperative all other members in the patronage pool make up the difference. As a result, the choice of pricing rule makes a difference to the members not only on the initial price, but on the resulting patronage paid.

Two general ways to calculate the cost of funds will be discussed - average and marginal. The average method corresponds very closely to pooled costing of expenses. If this were the predominant cost of funds

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[1]Repricing rules have become increasingly transparent for some borrowers (particularly larger ones) where pricing is explicitly tied to an index or a spread over debt costs. However, the majority of loan contracts in number do not explicitly link pricing to any specific underlying debt cost, allowing more pricing flexibility to the institution.

calculation rule, the information reported in Figure 4.3 on average interest bearing liabilities would be quite relevant in analyzing the relative cost of funds of each of the BCs. In reality pooling may take place, but on a selective basis within the organization.

Marginal cost pricing directly relates the current cost of funding a transaction to loan pricing. It implies a zero gap position since funds of a similar maturity are matched to a given loan, if funding and pricing are directly linked (i.e., if the loan is priced off of the instrument used to fund it). In reality the loan may be priced in this manner but may not be directly funded in this way.

Loan Contract Options

The lender also has the choice of making a loan on a fixed or a flexible (variable) rate basis. These provisions are a basic part of any loan contract. Fixed rate loan provisions may be for the term of the loan, or some shorter time period with future repricing necessary. Flexible interest rates allow for the periodic adjustment of interest rates at the option of the lender.

In practice, many contracts are more accurately interpreted as being semi-flexible since many fixed rate loans are only fixed for a portion of the term of the loan. In addition, many variable rate loans are not variable on a daily basis, but vary over such less frequent time periods as a week, month, or quarter. The loan contract may indicate the rate is variable at any time, but the organization may make a practice of limiting the frequency with which repricing takes place.

The determination of whether an interest rate is fixed or flexible is also dependent on other loan contract provisions. Robison, Baker,

and Brinegar noted that Federal Land Bank of St. Louis loans prior to 1969 carried fixed interest rates. However, since there were no penalties for early payment, the loans were effectively fixed on upward market rate movements, but flexible with respect to decreases in market rates. Since the borrower was able to refinance at a lower rate with no prepayment penalty, there was an incentive to do so, tempered to some degree by loan closing costs on the refinanced loan. The remaining term of the contract would also make a difference in the borrower's evaluation since this would affect the present value of the loan to the borrower (see Robison, Lins, and Koenig). It was indicated that in 1958 and 1961 the FLB voluntarily reduced rates on the fixed rate loans so refinancing was not even necessary.

Explication of Options

In this section some of the advantages and disadvantages of average and marginal cost pricing will be discussed in more detail. The fixed and variable contract options will then be considered within each pricing rule.

Average Cost Pricing

Average cost pricing is a standard cost allocation method used for many years by many types of organizations. One of the main reasons is accounting simplicity, and in banking it provides a great deal of flexibility as well. Funds acquired can be lumped, and changes in the portfolio mix are easily made since specific funds are not linked to specific transactions. There are also fewer problems with funding nonstandard repayment schedules since funds are not explicitly tied to specific loans. Funds are acquired in a very lumpy form through new

debt issues, while new loans may be smaller in size and loan payments are spread more evenly over time. As a result, average cost pricing leads to fewer pricing imposed constraints on cash management for the organization.

Pooling of funds in this manner also places the on-going management of funding in the hands of the BC's finance officers. With pool funding the borrower delegates these responsibilities to the BC, to the extent that they continue to be pleased with the results. Models such as that developed in Tauer and Boehlje focus on strategies to minimize the debt costs of the pool under this assumption.

Stability in rates over time is also achieved through average cost pricing, since no single debt issue should have a major influence on the cost in a given period. This removes concern a member who is less comfortable with the financial markets may have over whether they are pricing their loan at the most advantageous time.

A final reason that average cost pricing is preferred by some members is that it is congruent with their cooperative ideology of equal treatment. All borrowers face the same funding cost.

Average cost pricing carries with it some disadvantages as well. First, for planning purposes the ultimate cost of funding is unknown since the debt pool is continually being turned over. This also leads to concern over gap planning since the liability pool repricing period is flexible and subject to funding decisions over time. As a result, the asset pricing rule must have similar characteristics if interest rate risk is to be minimized.

Another issue is that rates lag the current market due to the averaging of debt costs. This creates a problem since competitors will

often use marginal cost pricing rules that will follow the market more closely. As a result, additional loan contract provisions that limit member entry and exit will be important. Members are very interdependent since gains and losses resulting from entry and exit are shared directly by remaining pool members.

With average cost pricing the loan contract provisions of greatest interest would be those that specify whether the rate will be fixed or flexible. Each of these cases is discussed in detail below.

a. Average Cost Pricing with Fixed Rates

This is one of the oldest pricing rules in many lines of business. When interest rates were stable, lenders incurred little interest rate risk in making fixed rate loans based on their average cost of funds since there was little variation in rates. Robison, Baker and Brinegar indicated that before 1957 the Federal Land Bank of St. Louis had no loans outstanding under the fixed rate interest plan with an interest rate less than the current period interest rate.

In the more volatile financial markets of recent history this alternative is used very little for a number of reasons. First of all, it is impossible to break even with this rule when interest rates are consistently rising. Since new debt taken on to finance additional loans carries a higher interest rate, the average cost of funds is rising. However, if new borrowers are charged only the average cost of funds, the average interest rate on outstanding loans will rise more slowly than the average interest rate on debt outstanding to finance the loans. As a result, if the situation continues for long the organization will eventually incur negative returns. This is the

situation that many savings and loan associations have faced, since this has been their predominant pricing rule.

On the other hand, the situation does work in a market where rates are stable or falling, as in the Federal Land Bank situation noted above where reductions in the fixed rate loans already on the books were offered since the average cost of funds was declining faster than the average interest rate of fixed rate loans outstanding.

A volume problem also arises with this rule. As rates fall the pooled costs fall less rapidly than new debt costs so members defect to get the lower rate from a marginal cost lender. When rates rise, the pooled costs rise less rapidly and there is an incentive for new members to join, but this only exacerbates the problem. The impact of significant levels of entry and exit is to dilute the stabilizing function the pool serves for its core members. Prepayment penalties (variable closing fees) are one method used to limit exit (entry) in a falling (rising) rate environment. These fees compensate the pool for the impact of their entry or exit to limit the impact on remaining pool members. However, market conditions have typically limited the magnitude of these fees, thus their effectiveness in a volatile environment.

If interest rates were volatile but fluctuate around a constant mean this approach would be workable and would provide a stabilizing function for members. However, this is done at the risk of facing greater movements in market trends that would result in losses to the pool. Another alternative is to offer relatively short fixed rate loans to reduce the potential impact of significant market movements.

b. Average Cost Pricing with Flexible Rates

This combination of rules theoretically avoids a loss situation from a funding perspective since the rate charged to the borrower can be adjusted as pool funding costs change. The problem that arises is that incentives for entry and exit are very direct. Since rates are not fixed, the pool is always being directly compared to marginally priced alternatives. Depending on the member's elasticity of demand, entry and exit may once again be a problem as the pool lags market rates.

In a rising rate environment the rate lags the market and members want to join the pool since its cost of money is favorable.[2] The pool expands in size as maturing debt is replaced and new higher priced debt is added to maintain and expand the pool. The new debt forces average cost to rise faster than it otherwise would have, yet it remains below marginally priced debt. All share in the benefits of the older cheaper debt.

The opposite happens in a falling rate environment. Members want to exit the pool since the average cost does not drop as rapidly as the cost of new funds. However, exiting leaves remaining members with the higher cost debt that cannot be rolled out as fast. Instead of revolving older, more expensive debt out and replacing it with cheaper debt, the pool simply shrinks and is unable to take on the cheaper debt.

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[2]This in itself may create an incentive to overinvest in a rising rate environment since it is an aberration among market signals. If the member attempts to equate the marginal value product of inputs with their cost, more units (dollars) of lower cost average priced debt would be used than higher cost marginal priced debt, leading to greater use of debt than would otherwise have occurred. The opposite effect would be seen in a falling rate environment.

Alternatively the pool could liquidate older more expensive debt in the market to speed the process up, but this simply changes the point in time at which the loss is recognized, not its magnitude.

An example of the impact of an average versus marginal cost pricing rule on market share is illustrated in Figure 4.4. The FICBs provide funds to PCAs and other financial institutions, which then lend to agricultural producers. The rates charged by the 12 district FICBs have been predominantly on flexible rate terms, with an average cost pricing rule. The FICB rate was used in this illustration since it most closely represents this rule in an aggregate sense for the institutions, whereas the BCs have used a much greater share of fixed rate pricing that makes aggregate price information much less meaningful. Clearer market share and pricing information was also publicly available.

The prime rate charged by banks on short term business loans was used as a representative marginal interest rate. Prime has been traditionally thought to move with the 90 day CD rate that serves as a source of short term funding for banks.

The FICB provides funding primarily for the non-real estate farm debt sector. Other participants in that market include banks, the Farmers Home Administration (FmHA), and private individuals. From 1976 to 1977 the change in FICB market share appeared to shift downward. This is largely the result of increasing growth rates in the FmHA portfolio (a 67% increase for FmHA as opposed to a 10% increase for the FICB for that year).

If the shift noted above is excluded, Figure 4.4 shows a great deal of correlation between changes in the FICB market share and its interest rate relative to prime. In general, the sign of the relative change in

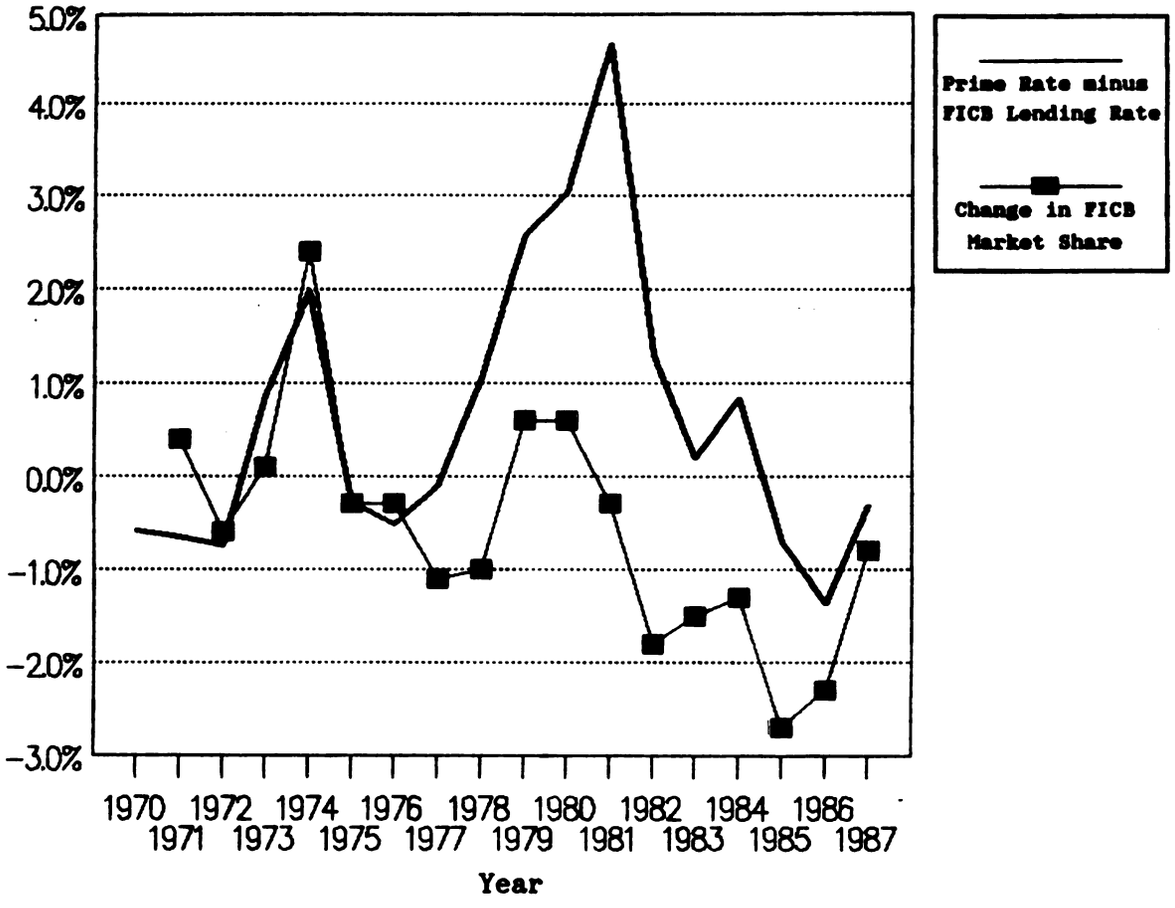

Figure 4.4. **FICB Market Share Changes and Relative Interest Rates. (USDA/ERS, Table 54; U.S. Department of Commerce, Bureau of Economic Analysis, 1988, 1987)**

the FICB market share tended to match the sign of the relative change in the interest rate differential. For example, as the FICB rate tended to have less advantage relative to prime, their market share tended to decrease. This would agree with what would be expected with an average cost pricing rule.

Some alternatives exist if an average cost pricing rule is to be used:

1. Keep the pool very short so that entry and exit do not make a difference since the time to maturity is so short. Fixed or variable rates are probably not the issue in this case. An example would be a seasonal loan pool that members use for short-term debt needs. However, this alternative results in greater rate volatility.
2. Reduce the entry and exit problems by developing commitment mechanisms. This might include closing fees, or "points" to enter the pool in an upward trending market. This reduces flexibility for the borrower but protects the pool.
3. Price to the current market (e.g., value bonds in the debt pool at their current market price) but pool revenue for those loans so that gains and losses are not transparent as loan transactions are made. This removes the immediate incentive to enter or exit, since the effective rate on the pool would be unknown until the pool was closed for the period and patronage dividends declared.
4. Develop pools with specific objectives and entry/exit limitations so that the benefits of pooling could still be enjoyed while controlling for some of the interdependence.

Marginal Cost Pricing

The other option for pricing the cost of funds is on a marginal basis. The most straightforward example is referred to as match-funding since individual funding instruments are being tied to individual loan transactions. One of the key requirements for a marginal cost pricing rule is to be able to accurately determine the marginal cost of funds. The BCs have an advantage in this area since bonds and discount notes serve as their primary source of funds, differentiated mainly by their maturity. In addition, existing debt within the organization can be easily priced due to readily available secondary market data.

Watson indicates there is a fairly unified belief that the cost of funds employed in bank lending should be computed "on the margin". However, one of the difficulties that other banks face is that their liability structure includes a very broad spectrum of depository instruments. In addition, there are fairly direct leverage effects on the organization from expanding their debt relative to equity (i.e. the cost of an additional dollar of debt is partly dependent on all of their other transactions since increasing the leverage of the organization may increase their cost of raising the additional funds). Within FCS the same effect is true, except that it is buried deeply within the system since individual banks are not currently differentiated with respect to leverage as far as the cost of funding goes. That is, all system banks receive funds from the fiscal agency at an equal cost for any given issue. Any discipline on leverage would be exercised by regulatory authorities that do not directly control the cost of funds.

The gap problem is addressed directly by the way that individual loans are priced and funded. Interdependence between borrowers is

minimized since loans can be funded directly, and the BC serves primarily as a conduit for funds. However, flexibility may become a problem. For smaller transactions bonds cannot be directly matched to the asset, and loan repayment terms are difficult to match with the funding directly. As a result, for longer term marginally priced products, there is either interdependence to the extent that loan repayment terms do not match funding, or some other product is needed to fill the inconsistency between the loan and funding. The member does know what their costs will be, but also must make a longer term commitment at a specific interest rate, requiring a higher degree of comfort with the fluctuations of the financial markets. This is particularly true if adequate prepayment penalties are maintained.

The problems with marginal pricing rest mainly with the flexibility that is given up in directly relating the specific assets and liabilities. The risk of interest rate fluctuation can be transferred from the BC directly to the borrower. For a large borrower with greater on-going debt needs this may not be a major issue since they may possess more specialized staff that can analyze the financial markets on a regular basis. Also, their greater debt needs may allow for effectively achieving some of the debt diversification functions that the pool achieves for smaller members.

The attributes of these four pricing options are summarized in Table 4.3.

BC Practices

The two main issues of concern, then, are funding and pricing for the cost of funds. While these two issues are closely linked, they may

Table 4.3. General Pricing Scheme Attributes

FUNDS PRICING: / REPRICING:	Average Cost Flexible	Average Cost Fixed	Marginal Cost Flexible	Marginal Cost Fixed
EXAMPLE:	Term Loan Pool	Old FLB Loans	Seasonal Loan Pool	Match-Funded Loans
Flexibility in funding and loan structure	High	High	High	Low
Potential stability of rates quoted	High	High	Low	Low
Knowledge of ultimate borrower interest cost	Low	High	Low	High
Financial market information required by the borrower	Low	Low	Medium	High
Interdependence with other member-borrowers	High	Medium	Low	Very Low
Gap management problems (interest rate risk for lender)	High	High	Low	Low[a]
Problems created be significant shifts in volume	High	High	Low	Low[a]

[a]These attributes are highly dependent on the use and enforcement of prepayment penalties, and would tend to move towards "High" if such penalties are not in place.

not be directly linked in practice. The linkage is a matter of evaluating the asset liability management practices of a given institution. First, the past practices of the BCs will be briefly outlined, and then the transition to their current funding practices will be discussed.

Past Funding Practices

The predominant funding practice used in the past by the BCs has involved a very direct linkage between funding and pricing. Variable rate seasonal and variable rate term loans were funded from explicit pools of debt instruments, with pricing based at some spread over the average pool cost of funds. For variable rate borrowers this approach provided some rate stability while avoiding the additional administration and financial market knowledge needed to effectively use fixed rate debt. Jerry Fenner, a finance officer at the St. Paul BC, indicated he had evaluated the stability of the St. Paul BC's variable rate seasonal pool against the prime rate since 1980. His data confirmed that the standard deviation of the pool rate was notably smaller than the standard deviation of the prime rate. This would support what would be expected from a pooled price.

Only one bank, Jackson, still makes use of this type of explicit pool funding and pricing arrangement. Jackson was cognizant of the concerns over what implication entry and exit have on remaining pool members. In order to minimize this problem it was indicated that they have fairly strong controls to limit movement from the pool priced variable rate programs to the marginal priced fixed rate programs. In essence, the borrower is required to chose either fixed rate or variable rate pricing.

St. Paul was the only other district that reported they had made use of explicit restrictions on movement between the programs. It was indicated that very large borrowers, who might have been interested in the variable rate programs, were required to use a "customer-managed" program that was essentially a variable rate, but the borrower had to make the decision as to what maturity of funding would be used, essentially making it a fixed rate program for short periods of time. The automatic choice is 30 day discount notes, but the borrower can make their own decision on alternate maturities.

Virtually all fixed rate funding by the BCs was initially done on a match funded basis, with funding and pricing very directly tied together. In these programs, borrowers were required to commit to the amount of their loans they would like funded by specific Farm Credit bonds that would be offered in the next bond issuance, often on a quarterly basis. The bank, in turn, would order Farm Credit bonds to be issued to match the borrower requests. This approach explicitly results in a zero gap position for those individual transactions and provides an easily identifiable marginal cost of funds.

A problem with the program is that the minimum efficient transaction size is quite large and the maturity offerings are limited to what Farm Credit bond issues are available for matching. In addition, if a bank's loan volume is shrinking they may not be in a position to issue additional bonds since they have excess liquidity from loan paydowns. As a result, they would want to fund loans with excess cash they currently have available. It may be possible to achieve an improved gap position by matching currently held bond maturities to new pricings. However, in this case the competitive market would

necessitate the pricing be based on current market rates for that maturity of funds, and the difference between the held bond's actual value and its marginal value in pricing is shared by all borrowers through net margins ultimately distributed to members.

Current Practices

There has gradually been a movement away from the use of explicit pools and matched funding towards a broader organizational approach to funding. All districts indicated a generally high awareness of asset liability management ideas, and indicated that quite a bit of work had been done in recent years to expand the System's understanding and use of those concepts. A broader ALM approach is more congruent with what other banking concerns have used and it provides for greater flexibility on individual transactions from a funding standpoint, since smaller transactions become aggregated within the banks total ALM position.

At the opposite end of the spectrum from the prior practices of explicitly tying virtually all loans to specific instruments or pools, are the district banks that have gone completely to an organizational based ALM approach. In those districts, the pricing and funding functions are nearly separated. The pricing is based off of a daily cost of funds established by the implied market cost of funds for that day. In the case of very large transactions, the treasury function may directly fund a fixed rate pricing to maintain a gap position due to the impact of a given transaction. However, in general the treasury function is funding the balance sheet based on some aggregate measure of loan repricings. In essence, the bank as a whole is being managed, not specific pools within the bank.

For fixed rate pricings this extreme case still does not represent a substantial difference in the aggregate from prior practices. It does provide for much greater flexibility by allowing for daily pricings and smaller transactions that are more cumbersome under a matched funded program. It also places more responsibility in the hands of the treasury function to manage the bank's overall position.

The bigger change is in the manner in which variable rate products are funded and priced. Under the average cost pricing program the variable rate products tended to lag market rates, and entry and exit problems resulted. With the movement to an overall ALM approach to funding, has come the elimination of pool based pricing for variable rate instruments. Instead, the variable rate products are now based on some current measure of market rates. Table 4.4 summarizes the pricing method used for variable rate seasonal and term loans by the district BCs. Note that only one bank continues to use average pool costs, while a number of others give some consideration to pool costs, but are more concerned with following prime.

A positive implication of making variable rates much more sensitive to current market conditions is that it effectively eliminates the entry and exit problems that arise from an average pool cost approach. Under this approach the variable rate tracks closely with fixed rate options, so that the primary advantage to the borrower under the fixed rate loan is being able to know with certainty what their interest cost will be. Mark Soukup of the Springfield BC indicated that borrowers have been increasingly moving to a position of saying "let me make my own funding decisions", which is just what fixed rate programs provide for. In addition, the variable rate pricing approach being used provides a short

Table 4.4. Summary of Variable Rate Pricing Practices

Variable Seasonal Pricing

Average Pool Cost - 1

Average Pool Cost with Prime Rate Consideration - 4

Prime Based - 5

30 Day Cost of Funds - 2

Variable Term Pricing

Same as Seasonal Rate (Pool Cost and Prime) - 2

Prime or Seasonal Rate Plus a Flat "Term" Spread - 6 *

Average Pool Cost - 1

One Year Cost of Funds - 2

Longer Term Money - 1

* One bank in this group indicated their "term" spread reflected greater credit quality differentiation.

Source: District banks

term option for those borrowers to use during the interim without affecting a variable rate pool as under the old programs.

In practice, an increasing share of the BC loan volume has moved to fixed rate funding. While exact numbers for all banks were not available, annual reports and interviews indicated that most BCs had over fifty percent of their volume in fixed rate programs, and a number were in excess of ninety percent in fixed rate programs. Large borrowers with greater financial expertise use virtually all fixed rate products, as evidenced by the CBC's fixed rate loans being 90.3 percent of their volume as of December 31, 1987. Smaller borrowers have greatly increased their use of fixed rate programs as well, since the minimum transaction size has gradually been lowered in recent years as banks went to an organizational funding approach.

The remaining question on variable rate loans is in fact how they are funded. Since these loans are able to be repriced on a very frequent basis and are following current market indexes, it would make sense from a gap standpoint to fund the variable rate products with very short term money. For variable rate seasonal loans this approach is fairly consistent. However, for variable rate term loans, the question is a bit more complex since the BC knows with a fair amount of certainty there will be a stable amount of volume in their variable rate term program. As a result, there is some incentive for them to make use of their financial market expertise to fund those variable rate loans in a manner that would minimize their debt costs, yet not take on an excessive amount of interest rate risk in the process.

For example, if a rising interest rate scenario was anticipated, the bank's treasury may find it advantageous to fund variable term loans

a bit longer than normal, which would improve their profitability since the rate charged to the borrower would be increased along with the current market rates. However, in the process, they take on some additional interest rate risk. Under a pool format, those participating directly in the pool would absorb the cost of that decision (or benefit from it) since it would affect the average cost of the pool. However, under the current approach all borrowers of the bank would benefit (or participate in the loss) as a result of the decision, since the ultimate impact is on earnings.

Conclusion

The BCs have moved largely away from pooled average cost pricing for variable rate products. Virtually all loan products offered are based on a marginal cost basis, a practice that is largely congruent with the pricing practices of other lenders. This movement has mitigated the entry and exit problems that arise with the average cost priced pooled products of the past. A fairly broad movement by cooperatives from variable rate products to fixed rate products makes some of the concerns about variable rate pricing less of an issue, but for smaller cooperatives who use primarily variable rate money, it still remains a concern.

One impact of pricing variable rate products on a marginal basis is to remove the perverse incentives that result from an average priced variable rate product that is not congruent with a marginally priced product offered by other lenders. For the BC borrower facing a rate that is not congruent with the market, they may be inclined to over- or under-invest at a given point in time due to favorable (or unfavorable)

financing rates available from the BC. The current practice of marginally pricing those products results in any gains or losses accruing to the organization as a whole, and being returned to the borrower in the form of a patronage refund. In essence, the incentive is changed from an immediate one to a deferred incentive that may have fewer adverse counter-market effects on the borrower's decision-making.

Another potential loss for the small borrower who has predominantly used variable rate financing is the reduction in rate stability that the pool had offered. The borrower must live with the less stable interest rate of the variable rate product, or commit themselves to fixed rate pricing. For the small borrower this remains an impractical option even though minimum participation amounts have been decreased, since it may be difficult for them to diversify their debt cost nearly as well as was possible through the broader pool participation.

One approach worth additional investigation among borrowers would be to determine the interest in a borrowing pool that could meet some of these objectives. Entry and exit under this approach have been a problem since borrowers end up in the variable rate pool by default as much as by choice. To make such a variable rate pool that is average priced workable, it would be necessary to require the borrower to participate in the pool for a period of time and enforce that participation through some rather stringent exit provisions. In other words, by requiring some longer term commitment to a pool such as this, the smaller borrowers could aggregate enough debt to make it possible for the bank's treasury department to justify managing such a variable rate pool for them. This would provide smaller borrowers an opportunity to make effective use of fixed rate funding programs and the financial

expertise of the bank that they cannot individually support. Entry and exit provisions would be very important to prevent remaining pool members from having to absorb the impact of other pool members' decisions to join or leave.

With respect to the overall organization, the current ALM approach has provided a great deal more flexibility for individual cooperatives to make funding decisions. The most flexible programs allow for daily pricing and smaller fixed rate investment commitments to provide borrower flexibility. The bank can minimize its exposure by making use of aggregate ALM techniques to reduce interest rate risk exposure rather than concerning itself unduly with individual transactions.

CHAPTER 5

OPERATING EXPENSE ALLOCATION

Operating expenses comprise the second major expense category in banking, exceeded only by the cost of funds. These costs are a function of the making and servicing of loans and related tasks. When issues such as cost control arise, the focus is on this category of expenses. However, its importance is often overshadowed by the relatively larger cost of funds component.

This chapter will specifically look at the operating expense component in the BC cost structure. The first section will consider the economic characteristics of this component, followed by some pricing rules that would be suggested by economic theory. The actual cost allocation practices of the BCs will then be considered along with member response to those practices. The chapter will close with some conclusions regarding the implications of these practices on members, and alternatives available.

Characterization of Costs

The operating expenses of the BCs and banks in general have been posited to exhibit significant economies of scale. These include economies both at the organizational level and with respect varying sizes of banking transactions. This section will review some of the reasoning behind scale economies in banking, a study of operating costs

done of the BCs in particular, and a study of PCA costs. The implications of these characteristics on cost allocation will then be discussed, along with economies in serving the larger customer.

Scale Economies in Banking

Many studies of banking have been done to evaluate the economic characteristics of operating costs. However, a note should first be made on the similarities and differences between the BCs and other lenders. Banks as a group vary widely in the services they offer and their balance sheet make-up. Nonetheless, their liability composition and related service requirements are similar, yet fundamentally different from the BCs. Commercial banks acquire a large share of their funds through their role as a bank of deposit, which leads to a broader array of liabilities, characteristics, and operating costs relative to depository instruments.

While the BCs offer some direct investment programs as a service to members, they do not act as a bank of deposit or generate a significant amount of funds in this manner. Rather, their liabilities consist primarily of instruments sold in the financial markets. As a result, the operating cost structure with respect to liabilities and their related services would not necessarily be comparable. However, the many other characteristics of the organizations would be similar enough to warrant consideration of studies in the banking literature.

Scale economies, or increasing returns to scale, refer to the situation where an increase in output results from a less than proportional increase in input. In economic terms, average costs are

decreasing and marginal cost is less than average cost. Kolari and Zardkoohi discussed four reasons that scale economies exist in banking.[1]

First, some inputs are wholly or partially indivisible in acquisition, as is often the case in developing new techniques. As a result, the firm may have unavoidable excess capacity in some inputs that are lumpy in acquisition. Seasonality in production may also contribute to this problem, since some inputs may be purchased to serve a maximum load, so increasing production at times other than the peak load may not require a proportionate increase in all inputs during off-peak times. An example in banking would be the development of an accounting system that allows for better accounting of costs and more flexibility in pricing individual loan assets. Once the costs are incurred to get the system developed and operating successfully, the cost of additional transactions or accounts would be minimal within overall computational limits. As a result, indivisibility reduces the average cost per unit of additional units of output.

The actual purchase of computing capacity has been considered highly indivisible in the past. However, advances in technology in recent years have resulted in substantial improvement in divisibility, reducing the advantage that larger banks had in this area. However, computer software for highly specialized applications continues to be an excellent example of indivisibility since there is little additional cost once the high costs of initial development have been incurred.

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[1]The discussion in Kolari and Zardkoohi is adapted from Stigler (pp. 153-60).

A second and related source of decreasing average cost is economies in the purchase of larger sizes of inputs such as equipment and buildings. That is, there is an inverse relationship between the productivity of some inputs and their cost per unit of productivity. A historical example in banking is the purchase of computer equipment since additional computing capacity has a relatively lower cost than adding smaller computers. This is one reason behind the many computer sharing arrangements that have been used. Joint use of buildings would be another example.

Third, increasing units of output allow for more specialization in production activities than do small operations. Through specialization employees are able to become more proficient at their job functions, improving the productivity of inputs.

A final reason for scale economies is the statistical property of large numbers. When the demand for goods is spread across a greater number of customers or transactions, the day-to-day fluctuations in aggregate demand are smoothed out to some degree. In banking, a larger institution may find it more economical to meet liquidity needs than a smaller institution since account balances and loan demand will fluctuate less on a daily basis.

These arguments for scale economies need to be tempered with the theoretical notion that average cost curves are thought to eventually increase with additional units of output. One reason is that at some point limitations to efficient management set in and costs tend to rise. As the organization increases in size the management and control of daily activities tends to lead to greater rigidity, and more internal negotiation to resolve conflicts, leading to higher costs (see

Liebenstein). Decentralization is often raised as a partial answer to this problem, but this may lead to sacrificing scale economies in other areas.

There also may be asset fixity problems in the short-run when firms need to invest in specialized production assets that have limited capacity or become suboptimal due to recent innovations. The firm may hesitate to make changes in their production process due to the additional expense of adopting the new technology. As a result, they may experience increasing costs from using their existing production assets.

Kolari and Zardkoohi conclude from an extensive literature review and research of their own that even though scale economies exist, there is not adequate evidence to predict a large scale consolidation of banking. Rather, the evidence would support the continued presence of many firms, but increasing specialization within market niches. Large firms may have an advantage of economies of scope through the joint production of a broader range of products.

Studies on BC Operating Costs

A wide variation in operating costs is shown among the 13 BCs, as illustrated in Figure 5.1. Note that CBC costs on participation loans are allocated to districts, while their costs on international loans are retained. The potential for reducing costs and increased coordination through restructuring the BC system has been evaluated on a number of occasions in recent years. However, one of the most recent systemwide efforts was the study commissioned by the BCs and completed in July 1987

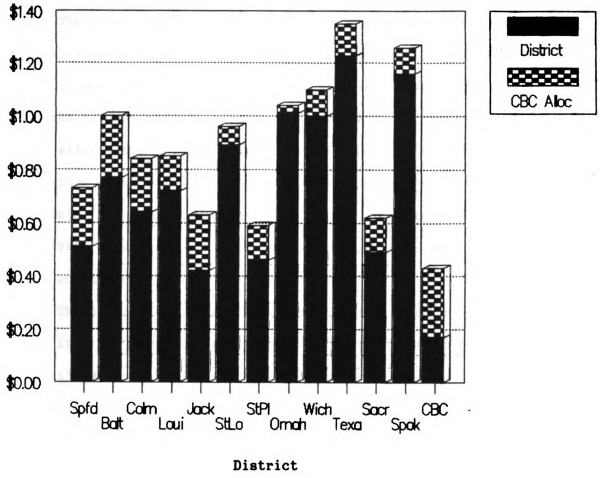

Figure 5.1. Operating Expense Per $100 Loans Outstanding, 1987. (Special Committee on BC Structure, Exhibit 4)

by Hopkin, et.al. referred to in Chapter 1.[2]. The study included an evaluation of scale economies with respect to both operating costs and the cost of funds (see Chapter 4). The methods and results of their estimation of the long-run average cost function of the BCs will be summarized here.

The model was based on one used to estimate cost functions for retail stores (National Commission on Food Marketing) using cost, output, and capacity data. All Central Bank costs, excluding those related to international loans that are done on a centralized basis, were allocated proportionally back to the districts, with actual operating costs per $100 of gross loans used as the independent variable.[3] The model was specified using cross-sectional data from 1981 and 1986. The model and parameter estimates are summarized in Table 5.1, and the cost curves depicted in Figure 5.2.

The statistical model relies on net worth (NW) as a measure of capacity, and gross loans per dollar of net worth (GL/NW) as a measure of utilization. The square of each term is included to provide for curvilinear short and long run cost curves. Implicit in this formulation is the assumption that the capacity of the institution, including the level of operating costs, is accurately reflected in the level of net worth. The relationship between net worth and capacity is somewhat direct since the institution is limited by lending limits and

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[2]The results of that study are also published in Hopkin, et.al. (1988), a bit more technical article.

[3]Note the direct treatment of the CBC as a vertical integration of the district BCs.

Table 5.1. Function and Regression Results for BC Average Cost Envelope, 1981 and 1986 Annual Data.

$$C_i = \beta_0 + \beta_1 T + \beta_2 (GL_i/NW_i) + \beta_3 (GL_i/NW_i)^2 + \beta_4 (NW_i) + \beta_5 (NW_i)^2$$

Where: C_i = operating cost per $100 of gross loans in district i,

T = a time dummy variable for year,

GL_i = gross loans in district i, and

NW_i = net worth in district i.

Description	Notation	Parameter Estimate	t Value
Intercept	β_0	2.429543	7.89***
Time	T	0.436837	6.54***
Gross Loans Per Dollar of Net Worth	(GL_i/NW_i)	-0.261134	-3.38***
(Gross Loans Per Dollar of Net Worth)^2	$(GL_i/NW_i)^2$	0.010751	2.03*
Net Worth	NW_i	-0.007911	-4.09***
(Net Worth)^2	$(NW_i)^2$	0.000020	2.50**
		Adjusted R^2 = 0.91	

* indicates significance at the 90% confidence level.
** indicates significance at the 95% confidence level.
*** indicates significance at the 99% confidence level.

Source: Hopkin, Sporleder, Padberg, and Knutson, 1988.

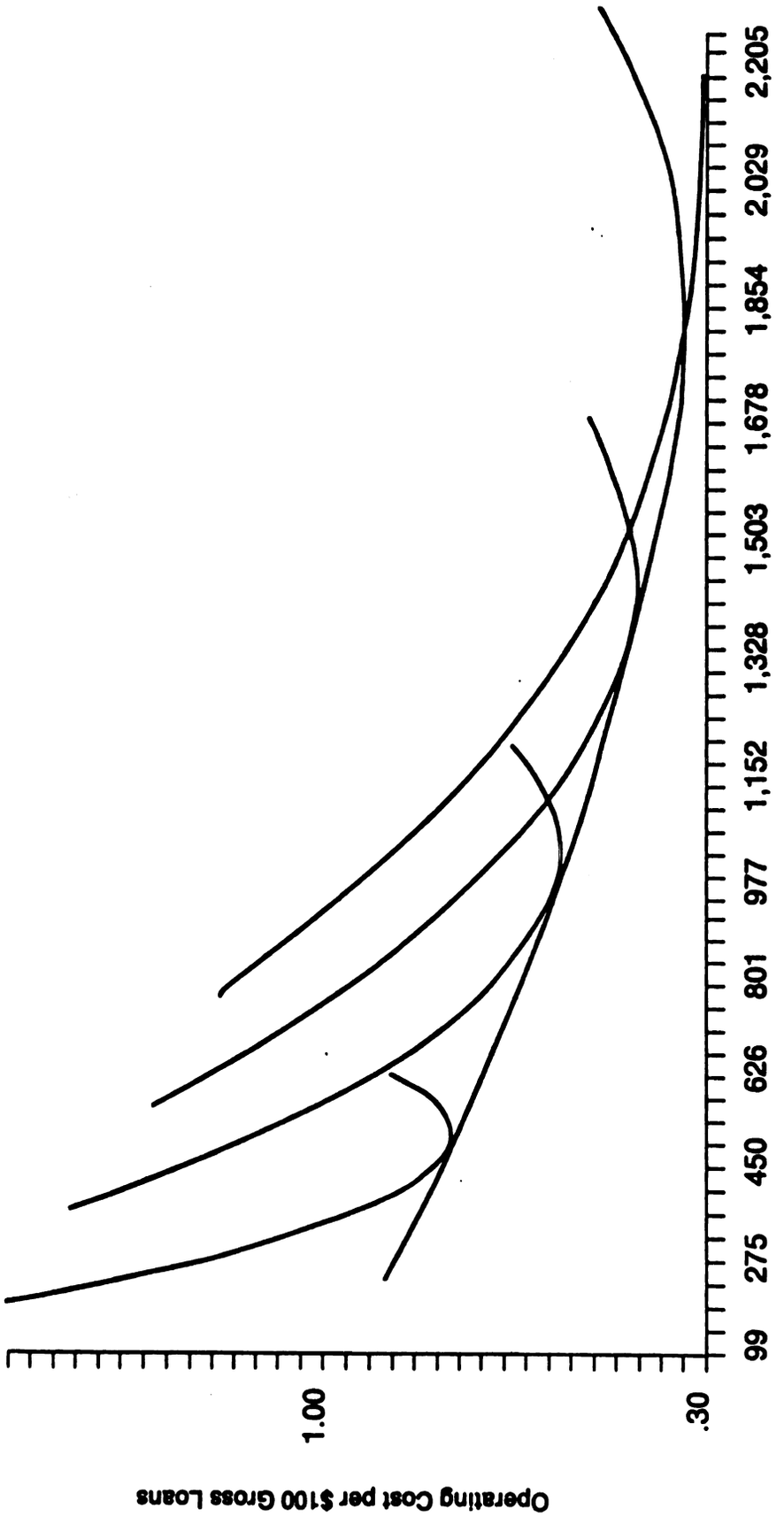

Figure 5.2. Estimated BC Average Operating Cost Curves. (Hopkin, Sporleder, Padberg, and Knutson, 1988, p. 78)

overall capital adequacy requirements as to the amount of loans that can be extended. However, the utilization measure implies that expenses are incurred at a level that would allow the institution to take full advantage of their capacity with no additional operating cost. This appears to be a rather weak assumption since operating expenses are more subject to adjustment with changing loan volume than they are to changes in net worth.

One question that is not empirically answered is the shape of the average cost curve over significantly larger loan volumes. The 1986 data indicates that gross loans ranged from $157 million in Baltimore to $1,420 million in St. Paul, a rather limited range for projecting operating costs for any substantially larger loan volume institutions resulting from restructuring the system.

In order to estimate the minimum point of the average cost curve, an assumption needs to be made on the estimated utilization rate (gross loans per dollar net worth). The short-run average cost curves reach a minimum at $13+ of loans per dollar of net worth, and the authors suggest $10 of loans per dollar of net worth as a common utilization rate. Based on the estimated parameters, the minimum point of the long-run average cost curve could be estimated at the two utilization levels. This yields a minimum average cost at $2 billion of gross loans for the $10 utilization rate, and $2.6 billion for the $13 utilization rate. However, both of these loan volumes are beyond the range of the data used in estimating the model. The authors conjecture a relatively flat average cost curve beyond $2 billion of loan volume (Hopkin, et.al., 1987, Appendix A). Yet, their model does not directly support this conclusion.

The study finding of interest here is that significant economies of scale exist within the BCs with respect to operating costs. The empirical data shows decreasing operating costs per $100 of loan volume as volume increases over the data range, as would be expected when scale economies are present. The concerns cited with the model do not undermine this conclusion, they simply cast doubt on the ultimate extent to which they exist at greater loan volumes than currently observed.

Scale Economies in Servicing Large Credit

Scale economies also exist within the firm in servicing larger credit, apart from the organization level scale economies already discussed. The direct costs of making and servicing a $500,000 loan as opposed to a $10 million loan of a similar type are quite different on a per dollar basis, but not necessarily on a per loan basis. Note that the unit of measure makes a great deal of difference in measuring scale economies. However, the BCs make little use of fees in charging for services so the relevant unit of measure used in pricing is the loan size since interest rates are what is priced.

PCA Cost Study

A detailed empirical study of PCAs in the St. Paul district was done by Fisher and Pederson to estimate the cost of serving different farmer customers related to the issue of pricing PCA loans. While the study is not directly applicable to the BCs, it provides some insight from a similar sister institution.

The PCAs are similar to the BCs in that their primary costs revolve around their role as a lender, not as a depository institution. As a result, some of the general conclusions reached would appear to bear on the BCs as well. An empirical advantage of the study is that a larger

sample size was available with a broader data range than in the BC study. However, the average size of the institution and individual borrower was considerably smaller than in the BCs.

Explanatory variables in the generalized least squares model estimating total and average PCA expenses were the number of customers, loan volume (or average loan size), special credit (vulnerable or loss) loan volume, and overhead expense (i.e. the intercept). All parameters were significant at the 90% confidence level. The model was estimated using the financial performance of 29 PCAs from 1986 ranging in size from $11.2 million to $165.7 million in total loan volume.

There were significant economies of size as measured by both PCA size and individual borrower volume. Overhead costs were estimated to be $137,528, which amounts to $174 per member for a hypothetical small PCA but only $58 per member for a hypothetical large PCA. The difference is a function of distributing costs over a larger membership.

Economies of scale related to customer size were also significant. It was estimated the average allocable expense for regular credit customers was 387 basis points for a customer with $20,000 of loan volume, but declined to 133 basis points for a $250,000 customer.[4] Special credit volume was also a significant parameter, indicating that greater servicing requirements would affect costs for these loans.

The model is not directly applicable to the BCs due to some structural differences in administrative overhead, loan size, and number of borrowers. However, it serves as another source in confirming the

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[4]The data range on this parameter was much more limited, which may bring into question the validity of this broad of a prediction.

existence of scale economies in the sector. Fisher and Pederson use the results as a justification for charging borrowers differing prices based on differing servicing costs, and to show that gains can be achieved through consolidating smaller PCAs to gain economies of scale.

Implications of Cost Characteristics

The presence of scale economies leads directly to a discussion of overhead costs. Scale economies result from spreading fixed overhead costs over a larger volume of business. These overhead costs cannot be traced directly to a specific unit of business for cost allocation purposes. Many of the administrative, accounting, legal, and other support services have high acquisition and operating costs, but can serve a broad range of business volume. All borrowers may benefit from this flexibility since it gives them access to additional capacity. In addition, these costs comprise a large share of operating costs, creating a difficult cost allocation question.

The overhead cost allocation problem is exacerbated by accounting limitations on segregating costs. Cole has dedicated a book to addressing cost allocation in banking for accounting personnel. Nearly all operating costs involve some degree of jointness between members since rarely are operating expenses undertaken for the benefit of a specific member. Rather, personnel costs and other expenses serve groups of members (e.g., by functional specialty, geographic region). As a result, even with the best accounting system, additional discretionary rules are needed to allocate direct expenses.

One of the most common rules used is simply to allocate costs to a more easily segregated cost center and then average them between members served by that cost center. This has the advantage of accounting

simplicity and what appears to be a rather innocuous allocation rule. However, it raises the problem that even what appear to be direct costs encounter some of the same problems dealt with in allocating overhead costs.

The accounting system may also be a constraint in determining how well cost differences may be reflected in price. Not only must the cost accounting system be adequate to keep track of direct costs and cost allocation rules, but the loan accounting system must have the flexibility of implementing a variety of pricing options that reflect these costs. In addition, development of a system to meet these needs may involve additional fixed costs.

Another cost allocation problem arises from the contract pool nature of loan pricing. Recall that in traditional cooperative pools the price is not known until the pool is closed out (Chapter 3). In the contract pool the member faces an initial price that is adjusted by the final patronage refund the member receives. However, the initial price the member uses in evaluating alternatives is more heavily weighted than the patronage refund (see Chapter 7). The problem arises for the cooperative to estimate expenses accurately in setting the initial price. The cooperative does not know in advance what their final operating expenses, including direct costs, will be at the time interest rates are established. As a result, they must use some method of estimating expenses in order to structure rates in advance. Any error in this estimation process degenerates into an average cost pricing rule within the given patronage pool.

The existence of economies of scale leads to a dilemma for the cooperative. Their presence is a major impetus for initiating

collective action in providing the good or service. Yet, they also lead to a very difficult cost allocation question with no absolute answer.

Theoretical Pricing Rules and Relevant Questions

Direct Costs

The handling of direct allocable costs appears to be unambiguous in the literature, with a consensus that "equitable treatment" would require that direct costs be allocated to those members benefiting from them. This amounts to a marginal cost pricing rule. However, given the accounting characteristics of these costs there are two problems. First, these costs amount to a relatively small portion of operating expenses, but may have a significant impact on a given group of borrowers depending on how borrowers are grouped for cost accounting. This leads to the second problem, of determining the rules for accounting and expense allocation. The major questions on this topic are:

- How will borrowers be grouped for expense allocations?
- How are estimates of future expenses estimated and used to determine current pricing, and how accurate are they?
- What accounting limits are there to tracking direct expenses and billing differing interest rates?
- To what extent do groups of borrowers benefit equally from grouped direct expenses?

Each of these questions reveals the degree to which the allocation of direct costs degenerates into an average cost pricing scheme.

Allocating Overhead Costs

The bigger question facing the cooperative is how to allocate the deficit not covered by the marginal cost pricing rule, Sexton's variable k. The traditional rule has been to spread it on a pro-rata basis, an equal or average cost pricing rule. Other possibilities suggested include an equal distribution among all members, or proportionally with respect to the direct cost allocation.

The common problem that arises is the situation where additional volume can be gained that would cover at least marginal cost, but not a pro-rata share of fixed costs. Pro-rata sharing ignores the idea of a contribution margin, the extent to which revenue contributes to covering overhead costs.

Sexton's suggested optimal rule (Chapter 3) would be to use a benefit-based allocation. Member input demand functions would be used to establish the individual benefit gained from working through the cooperative. However, this applies only in less than competitive markets, and even if this market qualified as such, the member demand functions would be difficult to calculate for the on-going member.

A problem that arises is that the practices of others makes a difference. The maxim posited for the IOF would be that they would be willing to expand volume at prices down to the level where only marginal costs are covered, to the extent that prices to other customers were not affected. If the competitor had either lower marginal costs, or an advantage in one of the other pricing components, there may be no core solution for the cooperative.

The discussion to this point has considered only the use of differential interest margins to cover the fixed and marginal operating

costs. Another alternative may be to use fees to cover the fixed costs (k) rather than an interest rate (per unit) assessment. The fee, as suggested in Sexton, could be tied to a surrogate that served as an indicator of potential borrowing. This could be a flat fee plus a fee related to anticipated needs, projected needs, balance sheet relationships, etc. The advantage of this alternative is that it puts the member in the position of making decisions based on marginal costs, since fixed costs would be covered already. As a result the member may be more willing to make use of their membership to its maximum extent than where fees are assessed on a patronage (per unit) basis. However, establishing and monitoring parameters become much more complex in such a program.

This also is congruent with the general movement in the financial services industry towards the unbundling of services. Charges for services are being made more explicit, and free or subsidized products are being reduced or eliminated. In a sense, it is a further movement away from traditional average cost pricing schemes.

Actual BC Practices

Analysis of Operating Expenses

The topic of detailed analysis of operating expenses was raised in interviews with management from the twelve district BCs and the CBC. There was some general interest in this area, but very little work had been done in detailed operating expense analysis other than in an aggregate organizational sense (i.e., there was a concern over general cost minimization, but not specific borrower analysis). The exceptions will be outlined below.

A number of districts indicated they had done some work in looking at individual product profitability. Columbia and Louisville did some work in this area by necessity since they made use of differential patronage pools based on a product breakdown (see Chapter 7). However, in both cases, a pro-rata sharing rule was used as a default allocation rule.

The Omaha district indicated that they evaluated profitability on their ten largest borrowers, but considered operating cost allocation on a pro-rata basis, as well, since much of their volume was very similar in nature. This is partly due to the fact that Omaha does not have as many very large loans, but their average loan size tends to be rather large.

The St. Paul and Wichita districts indicated they were looking at direct operating costs through cost accounting centers that differentiated between the large cooperatives that were few in number, and served by specialized staff; and the much broader number of local cooperatives that were further broken down by geographic regions.

In all cases where an overhead allocation rule was indicated, it was done pro-rata based on loan volume. The most extreme case of that, of course, is the CBC where operating costs must be allocated between district patronage pools by necessity. In their case, operating costs during 1987 appeared to be allocated at a level between 32 and 33 basis points on all participated loans (see Chapter 7).

There seemed to be a general attitude among those interviewed that market rates tended to dictate the spreads that could be achieved, rather than operating spreads dictating the price in a "cost plus" fashion. However, market conditions tended to allow the banks to get

larger spreads in those markets where their operating costs tended to be higher. For example, large borrowers would normally have lower direct operating costs per dollar borrowed, and market conditions also dictated lower spreads. The internal tracking of operating costs simply was done to facilitate a better understanding of what their costs were and how fairly members were being treated.

Once again this reflects a combination of views of the cooperative as a vertical integration of the member firm and as an independent firm. Concerns over generating similar levels of return across various borrower groups implies the vertical integration approach. However, this evaluation is quite general and very dependent on the arbitrary cost allocation rules chosen. As a result, the greater emphasis is on charging market rates and then evaluating what type of return is generated overall by the organization, the independent firm approach.

Cost allocation practices may be a bigger issue among the smaller borrowers since competitive market alternatives tend to be less constraining. For these borrowers, internal cost accounting serves as a means of tempering the rate that could potentially be charged within that market, with some measure of what type of return is generated on those loans in comparison to other loans of the organization.

Another common theme was reasonably wide acceptance of the differentiation in pricing between large and small borrowers. Small borrowers recognized that the cost of servicing their loans (on a per dollar basis) was probably higher and that an additional margin was warranted to cover these costs. Large borrowers tended to demand the lower rates that are available to them through competitive alternatives,

yet understood that they also needed to share in the overhead costs of the organization along with other borrowers, as well.

The primary method of distinction among borrowers that was used was varying the interest rate spread required on loans. Another means of differentiating between borrowers is in the fees that are charged. This is a method of covering operating costs that Sexton suggests, and will be noted in the following section.

Fee Usage

Sexton suggests that an appropriate pricing rule may be to assess a fee to cover overhead cost, and then base per unit cost on a marginal basis. As a result, the member would base individual usage decisions on marginal cost, rather than average cost.

In practice, the BCs have made only limited use of fees per se, except in a number of situations as outlined below:

- Commitment fees are more frequently being assessed in situations where the BC is either providing backup lines of credit, or serving as a residual supplier of credit. These fees most commonly take the form of a commitment fee assessed on the unused balance of a loan commitment, billed on the normal interest payment cycle. A second assessment method has been to charge the commitment fee on a borrower's usage of other suppliers of credit in lieu of bank credit. For example, the Springfield BC charges a percentage fee based on the borrower's average use of commercial paper during the prior quarter, for which their line of credit serves as a backup. This assessment method provides a direct incentive for the borrower to consider

the cost of the backup line of credit when evaluating the use of commercial paper as an alternative source.

- o A number of banks reported using commitment fees on term loans to meet competitive pressures. Other lenders typically charged some type of commitment or closing fees on term loans, and a number of districts indicated that they have structured packages in a similar manner to accommodate the borrower's desire to evaluate comparable loan packages. However, the goal has typically been to look at the anticipated all-in spread (i.e., net return per dollar including interest expense) with the fee, compensating for a lower interest spread with the upfront commitment fee.
- o A number of banks indicated that they do charge fees based on a cost recovery basis for additional costs involved in some transactions, mainly legal and closing fees.
- o The Sacramento BC was the only one that reported a standard practice of using upfront commitment fees on term loans and commercial paper lines of credit, as well as construction loans.

Most of these fees take on the form of an interest-oriented margin rather than an upfront fixed cost recovery vehicle as suggested by Sexton, excepting the Sacramento case. Backup line fees compensate the bank for risk and some operating cost, but more importantly, provide incentives for the borrower to make use of bank financing. The only case where fees are used in the manner suggested by Sexton would be as noted for meeting competitive pricing structures, or as noted for Sacramento.

Stock Ownership as a "Fee"

One of the problems with assessing upfront fees noted by a number of districts is the presence of BC stock purchase requirements. The borrower may see the stock purchase requirement as more of a fee than as an investment.[5] As such, they may consider capitalization as a commitment fee, even though the stock will presumably be retired at some future date. Another party noted that some borrowers indicate that "the BC charges for stock, your competitors charge fees - the result is the same".

Of particular interest is the movement of the BCs towards base capital plans. The National Bank and the St. Paul BC are currently proposing to move to base capital plans where the borrower must maintain a minimum level of stock as a percent of their prior 5 years average usage. Once a target percentage of stock ownership is reached, any excess stock acquired through stock (non-cash) patronage allocations or a reduction in average usage would be retired over the following year. No additional outright stock purchase would be required.

If funds usage in the past is a good estimate of anticipated usage, stock ownership under this plan may represent a surrogate "fee" to cover

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[5]There have been two primary stock purchase programs used by the BCs. One is the use of an "override", which is simply a purchase requirement included with each interest billing. The most common purchase levels have been 1% of the average annualized outstanding balance, or 10% of interest billed. The other program is to require the outright purchase of stock based on a percentage of the loan commitment, often referred to as advance capitalization. This is often required on very large transactions, and over time used in conjunction with an override program. A base capital plan (described later) may employ aspects of these programs for building capital. All stock is retired at the discretion of the board of directors, but generally according to some plan based on years the stock is held or past borrowing levels (base capital). Stock plans have varied between districts as to their exact provisions.

fixed costs that is established at the beginning of each year, as suggested by Sexton. If the borrower is adequately capitalized at the beginning of the year based on prior funds usage, the fixed level of stock investment for the year is also known. Based on the costs of alternative sources of funding, the "fee" that is paid is easily established. For a simplified example, if a 10% capitalization level is required and past usage calculated as $1,000,000, required capital would be $100,000. For the borrower already capitalized at this level, with alternative funding for the BC figured at 9%, the annual fee generated would be $9,000. However, with this analytic approach the patronage refund would be considered a direct offset to interest paid in evaluating marginal cost, not a return on the invested capital.

Conclusion

It appears that the whole area of operating expense allocation has not been delved into deeply by the BCs. There is a definite awareness of the need to control operating expenses, but the exploration of how those expenses are recovered from different groups of borrowers, and through fees, has not been a central point of concern. When fees have been considered, it appears that they are used primarily to meet competitive alternatives in structuring a similar loan package.

Theory would suggest this is an area of useful analysis and practice for the BCs. Upfront fees structured in a manner that covers overhead costs and provides for greater marginal cost pricing for operating expense may be a more equitable and competitive fee structure than strictly recovering operating costs through interest rate spreads.

Directly addressing the operating cost allocation issue has not been a major concern since prices are set in a market-oriented approach and single patronage pools are most frequently used. As a result, cost allocation information is used primarily for internal management evaluation.

Given the high proportion of overhead costs, a large share of the allocation process must proceed in an arbitrary manner by necessity. However, some decision must eventually be made on how overhead costs will be recovered, since they must be met if the firm is to cover all of its costs. The pricing strategy that results has implications for what products and services are offered, and how the firm performs overall. If a strict pro-rata sharing rule is used, some business may be forgone that still would have contributed to overhead coverage, but at a lower level. An example may be very large loans of high quality that can only be retained at thin operating spreads, but still cover marginal costs. Conversely, a higher price may have been possible in other transactions if a pro-rata sharing rule did not underlie the pricing. Smaller transactions in less severely competitive markets may be an example here. In any event, there must be an awareness of where pricing will allow for additional overhead coverage, and a recognition that a pro-rata sharing rule may not ultimately be possible if the firm is to survive.

CHAPTER 6

PRICING FOR CREDIT RISK

This chapter will focus on dealing with costs that arise from the default risk inherent in lending. The primary concern will be how individual BCs deal with measuring, and then pricing for this risk among their cooperative borrowers. The issue of pricing for credit risk also exists on a system-wide basis since the cost of Farm Credit securities is a function of the credit risk taken on by all system institutions that are jointly liable for their repayment. However, this issue will be discussed in conjunction with the distribution of net savings (Chapter 7) since it represents a potential impact on profitability.

Determining the actual costs that need to be covered in pricing for credit risk is a difficult task due to uncertainty over costs, and a temporal dimension to costs. The most obvious cost is actual loan losses incurred by the institution. In addition, higher operating costs are incurred through additional staff time necessary to monitor loan performance on riskier credits and to provide additional financial counselling, particularly when a loan must be liquidated.

The standard procedure used to account for default risk from a cost standpoint for lending institutions has been through an accounting reserve for losses that provides a temporal repository for future losses, both anticipated and unanticipated. That is, the institution will set up an accounting reserve at the point that they recognize there

is a potential for a loss on the loan, even though it has not actually been incurred through a liquidation process. General reserves are also established based on overall credit quality to cover unanticipated future losses. As a result, loss reserves represent a tool to deal with the temporal dimension of loan losses.

A lending institution must also deal with maintaining equity commensurate with the level of risk being incurred by the total organization. Equity investors are theoretically posited to require a higher return on their investment in riskier assets. As a result, institutions with riskier loan assets would require a higher level of earnings to satisfy equity holders, thus implying a higher lending cost. The Farm Credit Corporation of America indicates in a manual for those responsible for the review function of institutions that:

> "...the level of risk in the loan portfolio must be commensurate with the financial and managerial resources available to absorb such risk. Excessive risk endangers the viability of the lending unit, especially since risk cannot be precisely controlled. When loan conditions deteriorate, they invariably increase risk levels beyond normal economic expectations. Therefore, credit risk management entails prudent lending practices and monitored loan performance. It links potential risk from loan losses in the carrying costs of nonearning assets with sound financial management of the lending institution." (1986, p. 6)

They go on to note, among areas that need to be addressed, the need for differential pricing. The question in the context of this study is how do institutions allocate these costs among their borrowers? In addition, how do they do so within their legislatively prescribed mandate to price at competitive market rates? (i.e., How are they constrained by the risk differentiation practices in the competitive market?)

The first portion of this chapter will discuss the theoretical background of the default risk structure of interest rates, primarily

through publicly available information on securities of differing credit quality. Regulatory issues relating to credit risk will then be discussed, along with market-oriented issues in pricing for credit risk. The actual practices of the BCs will then be presented along with the cost sharing rules implicit in these practices.

Theoretical Background

The default risk structure of interest rates describes a relationship between the yield on securities and their default rates, with all other things held constant.[1] The notion is that investors require a higher rate of return as the perceived risk of default increases. Risk premiums are a commonly used term to identify the difference between the yield on a default-free security and the security in question, all other things held constant.

Distribution of Returns

When issued, debt securities carry a promised rate of return that is an ex ante yield at that point in time. However, the realized rate cannot be determined until the instrument is discharged and the actual payment amounts and timing can be analyzed. The difference between the promised rate and the realized rate is thus the loss rate resulting from default.

Since the realized rate is unknown until the instrument is actually liquidated, the investor must make a decision based on some expected rate of return, which may or may not be the promised rate depending on

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[1]This discussion draws heavily on VanHorne.

the expected default loss at the margin. The difference between the expected rate and the promised rate is thus the risk premium required by a particular investor.

VanHorne develops an expected value model to establish an expected default loss. This is based on a probability distribution of possible yields as perceived by the investor. Based on these expected default losses relative to the risk premium in the market, their purchase decision is rather straightforward; if the investor's subjectively formulated expected default loss is greater than the risk premium of the security they would not invest; while if their expected default loss were equal to or less than the risk premium, they would invest. The theory would suggest that in a market with many investors acting in this manner, the market risk premium would equal the expected default loss.

It is important to note that this approach implicitly considers investors to be neutral with respect to risk. The investor is only considering the expected value based on subjective probabilities, with no risk weighting. If assumptions of risk preference or risk aversion are also included this would have an impact on the return that the investor would require.

A number of empirical studies on default losses have been done, primarily looking at the corporate and municipal bond markets where public information is easily available. Table 6.1 shows corporate bond average annual default rates from 1900 through 1965. As might be expected, defaults increased significantly in periods of major depression, but have remained relatively low in the post-World War II period. It follows that it takes a rather severe economic downturn for

Table 6.1. Corporate Bond Average Annual Default Rates

Period	Default Rate (%)
1900-1909	0.90
1910-1919	2.00
1920-1929	1.00
1930-1939	3.20
1940-1949	0.40
1950-1959	0.04
1960-1965	0.03
1900-1943	1.70
1944-1965	0.10

Source: Atkinson, p. 43.

the promised yield to differ significantly from the realized yield, although the risk remains present.

Credit Ratings

A common means used by investors in the corporate bond market to develop an expectation of the default loss is the credit rating assigned to bonds by rating agencies. Table 6.2 enumerates the ratings used by Moody's Investors Service and Standard and Poors. The first four categories under each are considered to be investment-grade bonds, while those rated lower are considered speculative.

The bond ratings serve as a measure of relative risk among securities. However, they do not define the absolute risk of any individual security. Inspection of the difference in yields between Baa corporate bonds and treasury bonds indicates a widening during recessionary periods. The very high grade corporate bonds with relatively low default risk show less pronounced fluctuation in this risk differential than do the lower grade bonds. These yield differentials tend to widen during recessions, and then narrow during periods of economic expansion. In fact, VanHorne notes a study by Hickman where it was concluded that "the market usually overpriced low-grade issues (and underestimated default risks) near the peaks of major investment cycles." (VanHorne, p. 185)

Financial Ratios and Default Prediction

A number of empirical studies have been done to evaluate the predictive ability of financial ratios in anticipating corporate bankruptcies. VanHorne cites a number of studies in this area (see pages 174 to 176) that will not be reviewed in detail here. However, it was indicated that statistical models using financial ratios could be

Table 6.2. Credit Ratings by Investment Agencies

Moody's	Explanation
Aaa	Best quality
Aa	High quality
A	Upper medium grade
Baa	Medium grade
Ba	Possess speculative elements
B	Generally lack characteristics of desirable investment
Caa	Poor standing; may be in default
Ca	Speculative in a high degree; often in default
C	Lowest grade; very poor prospects

Standard & Poor's	Explanation
AAA	Highest grade
AA	High grade
A	Upper medium grade
BBB	Medium grade
BB	Lower medium grade
B	Speculative
CCC-CC	Outright speculation
C	Reserved for income bonds
DDD-D	In default, with rating indicating relative salvage value

Source: Van Horne, p. 178.

used to predict failure well up to two years before bankruptcy. With large firms a model showed that this could be done with a single year's financial statement, while another study focused on small business failures noted that a number of consecutive financial statements were necessary for successful prediction for the small business group. Another important point to note is that most investigators found the parameters to be unstable over time, so that ongoing assessment of the models was necessary to have reliable predictive power.

A number of studies have been done in this area related to agriculture loans. Lufburrow, Barry, and Dixon develop a credit scoring model for use in pricing individual farmer loans, based on financial data from five PCAs in Illinois. They cite a number of other works in this area, as well. One specifically applicable to this research is a model developed by Fischer and Moore for classifying BC loans in the St. Paul district. A stepwise logistic regression analysis was used to classify loans into either two or four classes, with one of the stated purposes of using the credit score for differential pricing of loans based on credit quality.

The variables used included the mean rate of return on local assets to measure the efficiency of local asset usage; total debt-to-local assets to measure solvency; a measure of operating efficiency; and, a dummy variable for structural differences in grain cooperatives. The model was used for the classification of loans in the categories of acceptable/acceptable-weak, problem, vulnerable and loss, the credit quality categories in use in the BC at that time. The model was used to provide an objective evaluation of loan quality that was in reasonable

agreement with their prior model and the subjective evaluations of loan officers.

Fischer and Moore also note the need to maintain a current model if it is statistically derived, since in their case a model estimated five years earlier was no longer very accurate. They cited structural changes that had occurred to invalidate the model, and the development of newer statistical tools that were deemed more appropriate.

Default Risk and the Term Structure Interest Rates

The discussion to this point has assumed that comparable maturity bonds were being considered when evaluating risk premiums. There are also differences in default risk among securities with respect to their length of maturity (i.e., the yield curve may have a different shape for different grade securities). Longer term securities tend to demand greater yield differentials than do short term securities. As the maturity date of the security comes closer, there is less uncertainty as to whether the party will default than when there is a greater period of time necessary before maturity.

For lower grade bonds other forces are also at work. In this case, as the maturity draws near and the company remains in a difficult financial position, the concern increases as to whether a default will occur. Johnson refers to this problem as "crises-at-maturity", a viewpoint that arose during the depression. During times of economic prosperity this would only be true of the lower grade bonds, while in a severe depression the problem was more prevalent for a broader spectrum of bonds. Figure 6.1 illustrates this concept, using a horizontal default-free yield curve for illustrative purposes.

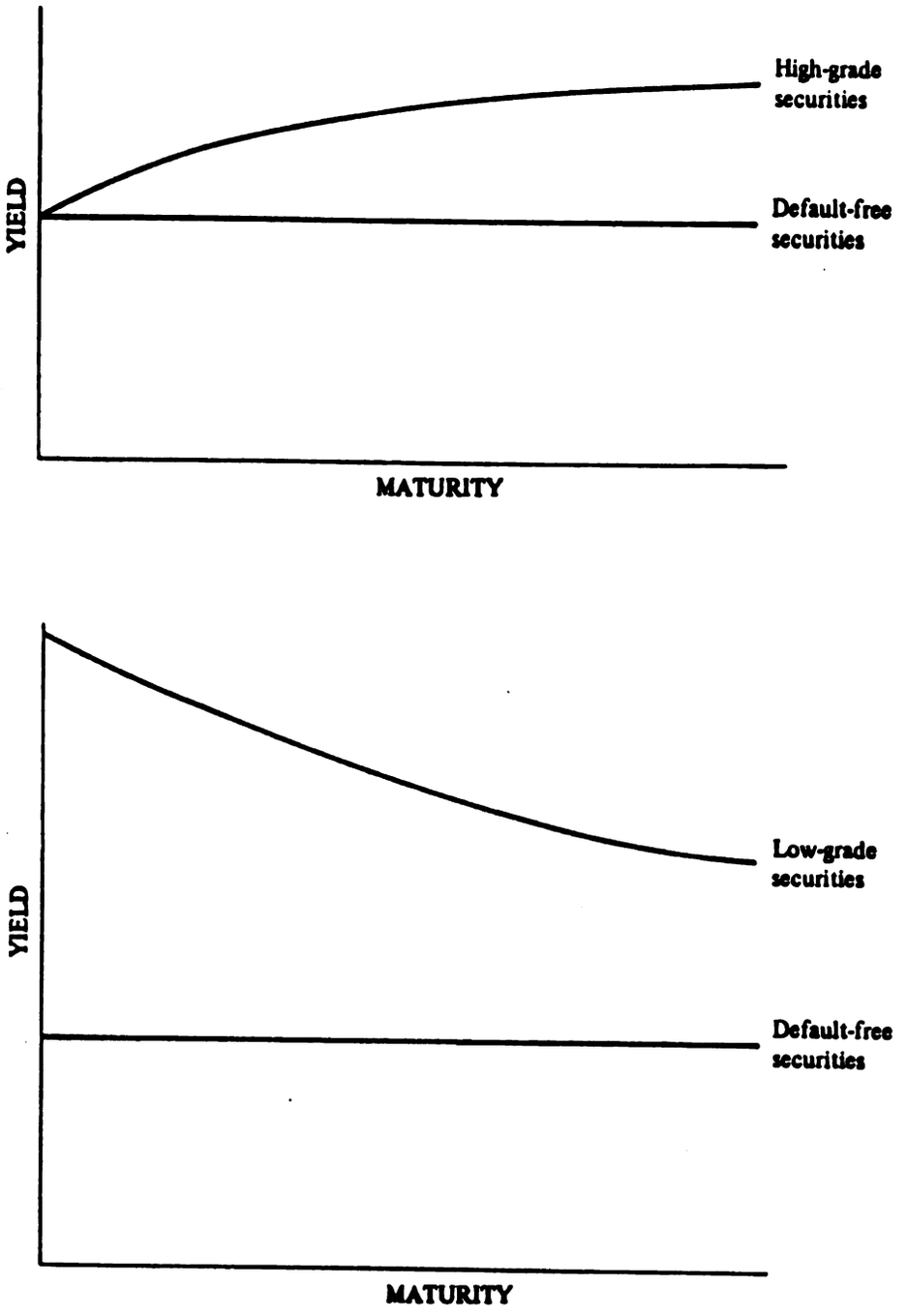

Figure 6.1. An Illustration of the Relationship between the Default Risk Premium and Maturity for Low-Grade and High-Grade Securities. (VanHorne, p. 194)

Regulatory Issues

Two regulatory modifications during the past two years are closely related with the credit risk area. First, during 1987 the classification system for evaluating FCS credit assets was modified to a basis similar to commercial banks. Secondly, new capital adequacy regulations were finalized in October 1988 that provide for risk based capital adequacy standards. Each will be considered below.

Asset Classification Issues

During 1987 the Farm Credit Administration moved to the Uniform Classification System (UCS) for credit review standards. This system is congruent with that employed by the Comptroller of the Currency, Federal Reserve, and Federal Deposit Insurance Corporation for the examination of commercial banks. The system is used to specifically identify the dollar amount of risk involved in credit assets, and, as such, is very closely tied to the ultimate accounting reporting of loan losses. Table 6.3 lists the five classification categories under UCS.

The primary difference between the two systems is that the new system is specifically focused on considering the asset value of the financial instrument. The old system was focused on making an assessment of the borrower's overall financial condition. While the systems may produce somewhat similar results, they are not necessarily congruent. In most cases, with loan documentation problems being the most notable exception, the UCS system tends to produce higher quality credit classifications than does the old system. This results from the fact that the lender's loans may be adequately protected so the liquidation of the debt will not be jeopardized, yet the borrower may be

Table 6.3. Uniform Loan Classification System Categories

Acceptable: Non-criticized credit assets of the highest quality. They do not fit into any of the following categories.

Other Assets Especially Mentioned (OAEM or Special Mention): Credit assets in this category are currently protected but are potentially weak. They constitute an undue and unwarranted credit risk but not to the point of justifying a classification of substandard. The credit risk may be relatively minor yet constitute an unwarranted risk in light of the circumstance surrounding a specific asset. Special Mention loans have potential weaknesses that may, if not checked or corrected, weaken the loan or inadequately protect the institution's position at some future date.

Substandard: Credit asset[s] which are inadequately protected by the current sound worth and paying capacity of the borrower or of the collateral pledged, if any. Assets so classified must have a well-defined weakness or weaknesses that jeopardize the liquidation of the debt. They are characterized by the distinct possibility that the lender will sustain some loss if the deficiencies are not corrected.

Doubtful: A credit asset classified doubtful has all the weaknesses inherent in one classified substandard with the added characteristic that the weaknesses make collection or liquidation in full, on the basis of currently existing facts, conditions and values, highly questionable and improbable. The important and reasonable specific pending factors that may work to the advantage and strengthening of the loan, its classification as an estimated loss is deferred until its more exact status can be determined. Pending factors include proposed merger, acquisition or liquidation procedures; capital injection, perfecting liens on additional collateral and refinancing plans.

Loss: Credit assets classified loss are considered uncollectible and of such little value that their continuance as bookable loans is not warranted. This classification does not mean that the asset has no recovery or salvage value, but rather it is not practical or desirable to defer writing off this basically worthless asset even though partial recovery may be effected in the future.

Source: Farm Credit Corporation of America (1986), pp. 52-53.

having financial difficulties or negative trends that are not currently a direct threat to this particular lender.

An example might be a cooperative whose loans are well secured by the BC and where cash flow is adequate to meet financial obligations. However, management practices, competitive circumstances, or other factors may be a threat to the long term viability of the organization, even though the lender would not lose money on the loans that are extended. The prior system was much more oriented towards the borrower's overall financial health, rather than a more narrow assessment of the bank's loss exposure. As a result, the old system tended to be more anticipatory, while the new system has focused on a current assessment.

From an accounting standpoint, UCS appears to do a more accurate job of identifying loss potential for financial accounting purposes than did the prior system. It coincidentally provided for an upgrading of FCS loan assets at a time that it was desperately needed as well, and it provided for more comparable financial information for comparison with commercial banks.

Table 6.4 provides a breakdown of BC loan volume as reported by the Farm Credit Corporation of America, to provide some indication from public information of loan quality. Although some substandard loans are not included in high-risk assets, the vast majority are included there. As a result, the assets listed give an indication of assets classified with a lower quality than acceptable or special mention (OAEM). Restructured loans are those where the contractual terms have been amended or revised to incorporate concessions made to the borrower to facilitate collection. It is quite obvious that for pricing purposes

Table 6.4. BC Loan Performance Information, December 31, 1987 (Millions of dollars and percent of total loans).

District	Volume	Restructured		Other High-Risk	
Springfield	125.4	-		-	
Baltimore	56.8	-		1.9	3.4%
Columbia	255.6	-		12.1	4.7%
Louisville	376.0	-		0.3	0.1%
Jackson	349.7	-		19.6	5.6%
St. Louis	318.1	11.4	3.6%	0.6	0.2%
St. Paul	922.6	0.2	0.0%	21.8	2.4%
Omaha	301.1	10.1	3.4%	-	
Wichita	451.9	-		0.5	0.1%
Texas	179.7	7.7	4.3%	1.8	1.0%
Sacramento	465.5	66.1	14.2%	15.4	3.3%
Spokane	202.5	-		3.0	1.5%
Central Bank	4,219.8	5.7	0.1%	7.5	0.2%
Combined	8,224.6	101.2	1.2%	84.6	1.0%
Number of Loans	4,342	14	0.3%	58	1.3%

Source: Farm Credit Corporation of America (1988), p. 64.

UCS does not provide a great deal of differentiation among borrower numbers. This is a result of both the generally high quality of BC loans, and the less selective nature of the UCS system. However, it does represent a uniform means of measurement across organizations since standards are set and reviewed by FCA. The information on the BCs in Table 6.4 compares very favorably with other institutions in the Farm Credit System as well as lenders outside the system.

Capital Adequacy Requirements

The Agricultural Credit Act of 1987 required that the Farm Credit Administration develop minimum capital adequacy standards, "taking into consideration relative risk factors". This is similar to the risk based capital guidelines that are being reconsidered for commercial banks. Final regulations were published in the Federal Register on October 5, 1988, requiring Farm Credit System institutions to maintain permanent equity capital of at least 7% of risk-adjusted assets. Permanent capital essentially includes all equity capital that is considered at-risk, and cannot be retired, except at the discretion of the board of directors. Guidelines are to be phased in over a five-year period ending January 31, 1993. Assets are categorized into risk categories for determining minimum capital requirements. Table 6.5 outlines the risk weights as stated in the regulations. Note that off-balance sheet items are also included within capital requirements.

Humphrey and Humphrey raised a number of issues related to risk-based bank equity capital guidelines that were proposed by the Federal Reserve. It was pointed out that risk-based guidelines would create an explicit tie between equity capital and given assets when considering the allocation of the implicit cost of capital. In

Table 6.5. Summary of Risk Weightings for Risk-Based Capital Guidelines

Balance Sheet Assets

Category 1: 0 percent
- Cash and demand balances held in banks.

Category 2: 10 percent
- Securities issued by U.S. Government and agencies.
- Loans guaranteed by U.S. Government and agencies.

Category 3: 20 percent
- Investments in state and local government obligations.
- Obligations and investments in Farm Credit institutions.

Category 4: 50 percent
- All other investment securities with maturities under 1 year.

Category 5: 100 percent
- All other assets including but not limited to loans, leases, fixed assets and receivables.

Credit Conversion Factors for Off-Balance Sheet Items

The face amount of off-balance sheet items will be multiplied by the appropriate credit conversion factor below, and assigned to a risk-weight category above.

0 Percent
- Unused commitments with an original maturity of 1 year or less.

20 Percent
- Short-term, self-liquidating, trade-related contingencies, including but not limited to, commercial letters of credit.

50 Percent
- Transaction related contingencies (e.g. bid bonds, performances bonds and standby letters of credit).

100 Percent
- Direct credit substitutes (general guarantees of indebtedness, including standby letters of credit serving as financial guarantees for loans).
- Credit equivalents of interest rate contracts and foreign exchange contracts (except single currency floating/floating interest rate swaps) shall be determined by adding the replacement cost (mark-to-market value, if positive) to the potential future credit exposure, determined by multiplying the notional principal amount by the following credit conversion factors as appropriate:

Remaining Maturity	Interest Rate Contracts	Exchange Rate Contracts
Less than 1 year	0.0%	1.0%
1 year and over	0.5%	5.0%

Source: 12 CFR Section 615.5210, as published in the Federal Register Volume 53, Number 194, October 6, 1988. pp. 39248-39250

commercial banks, this is a major issue with respect to managing cash items in the process of collection (CIPC) and other areas that will affect capital requirements. While that particular issue is not as serious for the BCs, the explicit tie between other assets, including off-balance sheet items, does more directly require an adequate return on assets.

To comply with the new guidelines each institution must classify its assets into the 5 categories listed and maintain a 7% permanent capital level based on the appropriate risk weighting. For example, a loan (Category 5) has a 100% risk weighting so it would require a 7% capital level, while a U.S. government security (Category 2), most likely held for liquidity needs, would be weighted at 10% so it would require a 0.7% (7% x 10%) capital level. Off-balance sheet items would be handled in a similar manner after using a conversion factor. For example, a standby letter of credit would be subject to a 50% conversion factor and assigned to Category 5 (100% risk weighting), resulting in a required capital level of 3.5% (50% x 100% x 7%) of the contingency amount, the face value of the letter.

Loan assets comprise the majority of BC assets, and are all weighted 100 percent with the new regulations. The only exception within the BCs would be government guaranteed loans that receive only a 10 percent risk-weighting to the extent that they are guaranteed. The capital requirements on commitments and letters of credit will also affect those areas, but will not be addressed here. The major point raised here that will be addressed later is the manner in which BC management will allocate capital requirements within aggregate loan volume. The regulations simply require that 7 percent of the aggregate

risk adjusted assets be backed by permanent capital. However, for cost allocation purposes, it would not be necessary to allocate a capital cost of 7 percent to all loans. Rather, capital costs could be allocated above and below that amount so long as in the aggregate the weighted average was 7 percent. This point will be returned to below.

Market-Oriented Issues

The manner in which competitors of the BCs price for credit risk is an obvious constraint to the practices the BCs can use. In addition, the 1986 legislation requires that the BCs not price below the competitive market. Compounding this problem is the heterogeneous market that the BCs face. As mentioned earlier, in even the simplest assessment, they operate within a credit market for smaller loans where they tend to be a price setter due to fewer direct competitors. They also compete in a very competitive market where the larger cooperatives have a number of financing alternatives. As such, the risk pricing practices of competitors are especially important for one segment of the market, while there tends to be some discretion in the manner in which risk is priced for in the less directly competitive portion of the market.

Competitive Market Risk Pricing

Much of the earlier discussion on the default risk structure of interest rates was based on corporate bonds, which operate very clearly in the competitive marketplace. A number of the districts indicated that for their large customers commercial paper was the major competition in short-term funding. Commercial paper is rated in a similar manner to the corporate bonds that are outlined in Table 6.2.

It is apparent from reviewing the UCS categories and the bond rating categories that the former provides much less differentiation than the latter. As a result, for the large credits, UCS does an inadequate job of differentiating borrowers within the competitive marketplace. Given this problem, a number of the banks indicated that they have made use of Loan Pricing Corporation (LPC), an organization that specializes in providing competitive pricing information for corporate and commercial loans. The organization maintains an extensive proprietary market database on transactions where key factors such as sales size, credit score, industry, location, and loan purpose, are tracked. They indicate that consistent differences in pricing are found with respect to differences in these key factors. The database is maintained through anonymous information provided by subscribers, as well as publicly available information. Two districts noted that they made use of a computerized database supplied by LPC that provides a range of interest rate spreads in the market to price larger loans, given the specified parameters.

LPC's credit score for non-criticized credit assets is adapted from the National Bank Examiner Risk Classification System outlined in Table 6.6. Note that this classification system includes five categories of acceptable (non-criticized) loans, while the standard UCS system includes only two, acceptable and special mention. This level of differentiation appears to parallel fairly closely with the level of differentiation within the bond market. The bond market grades include four or five investment grade bonds (depending on the rating agency), and then a number of poorer quality bond levels. Thus, if the BCs are

Table 6.6. Risk Rating Definitions For Acceptable Credit.

Risk Category	Description
Minimal Risk	Excellent business credit: superior asset quality, excellent debt capacity and coverage; excellent management with depth. Excellent industry. Company is a market leader with access to capital markets.
Modest Risk	Good business credit: very good asset quality and liquidity, strong debt capacity and coverage; very good management in all positions. Above average industry. Company is highly regarded.
Average Risk	Acceptable business credit, within normal credit standards: satisfactory asset quality and liquidity, good debt capacity and coverage; good management in all critical positions. Industry has moderate cyclical characteristics. Company is of average size within the industry.
Management Attention Risk	Below-average business credit: generally acceptable asset quality, somewhat strained liquidity, limited debt capacity and coverage; some management weakness. Industry is cyclically vulnerable and moderately important. Company is a lower-tier competitor.
Special Mention	Marginally acceptable business credit; some potential weakness. Generally undesirable business constituting an undue and unwarranted credit risk but not to the point of justifying a Substandard classification. While the asset is currently protected, it is potentially weak. However, no loss of principal or interest is envisioned. Potential weaknesses might include a weakening financial condition, an unrealistic repayment program, inadequate sources of funds, lack of adequate collateral, credit information or documentation. Industry is highly fragmented, non-essential, vulnerable to regulation and highly cyclical. Company is undistinguished and mediocre.

Source: Loan Pricing Corporation; adapted from the National Bank Examiner risk classification system.

competing in that market a greater level of differentiation is necessary, as the LPC and National Bank Examiner system suggests.

Snyder notes in a discussion of interest rate spreads that "relative to the bond market, banks tend to charge higher grade borrowers more and poorer quality borrowers less." (p. 4) The issue amounts to a question of what level of marginal cost pricing is to be pursued for credit risk. The bond markets provide a means for very specifically differentiating rates based on a perception of quality. Commercial banks, through less differentiation of acceptable credit, have opted in the past for a broader average cost pricing rule than the bond market.

BC Practices

General Results

Interviews with the twelve district BCs showed they were separated into three basic categories with respect to risk pricing practices. Two of the banks use no risk based differentiation of their loan products. Six of the remaining banks use systems that price for risk that are very congruent with the UCS categories, while four of the remaining districts had systems that were more selective than the UCS system (i.e., loans within the acceptable category were further differentiated). Table 6.7 indicates specific district practices.

Actual specifications of the programs vary from district to district, even among those that made use of the UCS system as a means of differentiating between acceptable and the lower quality borrowers. A common provision was that only acceptable and OAEM loans were able to participate in fixed rate programs that generally provided lower

Table 6.7. Risk Pricing Differentiation with respect to the Uniform Classification System (UCS).

No Spread Differentiation for Credit Risk
Wichita
Texas
Classifications the Same as UCS
Baltimore
Columbia
Louisville
Jackson
Omaha
Spokane
More Restrictive Credit Risk Differentiation than UCS
Springfield
St. Louis
St. Paul
Sacramento

Source: District banks

relative interest rates than variable rate programs. It is important to note that those BCs that were using UCS to differentiate on credit quality were actually differentiating only a very small proportion of their loan volume (see the high-risk asset summary in Table 6.4).

The four banks that were using more selective risk differentiation practices deserve a bit more discussion:

- The Springfield BC made use of three spread levels on both fixed and variable rate products. The borrower was placed in one of the categories based on a subjective judgement of their credit quality and size. However, since only acceptable credits qualified for the fixed rate program, they were necessarily differentiating even the acceptable borrowers into three groups on that program. From a practical standpoint, the acceptable borrowers were concentrated in two main groups on the fixed rate program.
- The St. Louis pricing program subtiered the special mention and acceptable credit classifications into three groups - excellent, satisfactory and good, with differential rate spreads applied to each group.
- St. Paul has maintained a credit classification system very similar to the system used prior to UCS for pricing purposes. While the two systems are similar, the Customer Rating system focuses on a "customer view" rather than asset classification.
- Sacramento indicates no regimented classification system was used. Rather, the focus was on pricing to market, which necessarily took into account differences in credit risk and the borrower's access to credit elsewhere.

A number of BCs indicated a concern that commercial lenders were being very aggressive, particularly on short term money, on the more marginal acceptable credit risks. This is consistent with Hickman's earlier comment on the underpricing of default risk in periods of economic expansion, such as the current one. As a result, the ability to maintain appropriate spreads to compensate for risk on those accounts was undermined and it was necessary to make an assessment as to whether an adequate margin could be retained on those credits. One district also indicated the problem exists for even the very highest quality credits with access to either differential credit programs or prone to continual solicitation by other lenders. In those cases, this district indicated that they have at times chose not to meet a competitive quote since the margin was simply not enough to justify the transaction for the bank, even for the very best quality customer.

In most districts there was a very high concentration of local cooperative borrowers in the best credit quality rating. As a result of this high concentration, differentiation based on credit risk was limited among these accounts, resulting in more average cost pricing for risk within this group. This may be related to earlier citations of difficulties in assessing risk at a point in time since a number of consecutive financial statements were deemed necessary for accurate prediction.

Determining Spreads

The discussion up to this point is concerned primarily with the relative risk of loans. However, somehow this measure of relative risk must be translated into actual spreads for the concept to be useful in an applied sense. Three general means by which the BCs have done this

are through ad hoc market-oriented approaches, through use of an arbitrary spread differential, and through formulas based on equity financing levels.

Most of the banks have used ad hoc market-based approaches to varying degrees to determine risk differentials. The simplest approach has been to charge risk differentials on an individualized basis considering their perception of what the market would bear. The most formalized market-oriented approach was the use of the LPC type of program discussed earlier. This database program essentially provides for ranges of market values on a particular type of loan transaction, with credit risk being one of the parameters. A number of banks also indicated that they do competitive monitoring either through borrowers, or by following publicly available information that would give some idea of risk spreads on publicly traded instruments.

The second means used is simply applying an arbitrary spread differential, such as plus or minus 50 basis points, to compensate for credit risk. This is by far the most common practice reported, but it is necessarily constrained by the market as well since borrowers with alternatives could obviously pursue them if the spreads were unreasonable, based on the market.

The response of the market may be quite limited, though, in lower quality credits that do not have alternatives available but may still be able to meet debt service requirements. In these cases, one individual indicated that the bank is simply constrained by the ultimate ability to collect interest regardless of the rate charged. He indicated that rates may actually decrease at some point, as credit quality declines due to this problem.

The only district that used a very formalized internal means of cost allocation with respect to pricing for credit risk was St. Paul. It was indicated that risk pricing differences were determined based on a formula making use of varying levels of equity financing on the loan. Asset risk is related to the buffer function that equity serves for loan loss exposure between holders of the lender's debt instrument and the borrowed funds. Varying levels of equity would be assigned by the bank to loans that would result in varying spread requirements. Since equity funding would require a higher rate of return than debt funding, the pricing implication is that riskier assets that require greater equity financing would require higher spreads.

The actual risk premium charged would be a function of the difference between debt and equity capital costs, as well as the level of equity funding required. This ties back rather closely to the risk-based capital requirements outlined earlier. The requirement in the aggregate is 7 percent equity financing on all loans (i.e., 100 percent risk weighting with a 7 percent minimum permanent capital requirement). In addition, the bank may require a higher level of equity capital according to their own business plans. However, their requirement is an aggregate requirement, so the bigger question on cost allocation is whether all loans would require the same level of equity financing (average treatment) or whether differing levels of equity financing would be required (marginal treatment). St. Paul's model explicitly treats loans on a marginal basis. However, a great deal of averaging continues to occur, since they also have a limited number of pricing categories.

Servicing Cost Differences

Higher risk loans may also have higher servicing costs. The study done by Fischer and Peterson of PCAs in the St. Paul district included in the objective function parameters to measure differences in special credit and regular credit in an equation evaluating allocable expense. Special credit included the most distressed loans where at least a probability of loss exists (classified "vulnerable" and "loss" under the old classification system). Regular credit included the remaining loans, all of which were deemed fully collectable (loans classified "acceptable" or "problem"). The parameter estimate for special credit volume in the operating cost function was significant, and they suggested this as support for a surcharge on loans in special credit based on substantially higher operating costs to service this credit.

In the case of the BCs the number of classified loans is quite small relative to the total organization (see Table 6.4) providing for little differentiation among the total number of borrowers. In addition, there exist substantial differences in the servicing required of loans that are not classified. For example, the loans to a cooperative that has experienced negative financial trends under the current economic environment may still be sound, but additional servicing is likely to be required to assist the cooperative in responding to the situation to avoid further deterioration. While servicing costs are higher, the pricing system must be structured to respond to these differences.

Conclusion

The credit risk component includes elements of both attributable and nonattributable costs. Additional direct servicing costs for distressed loans can be identified and priced accordingly. However, while loan losses can be ultimately attributed back to an individual loan, it is impossible to assess the loss to the respective party. As a result, the potential for loan losses carries some of the characteristics of overhead cost. The question comes down to one of how to allocate these costs among current borrowers.

There seems to be fairly wide agreement that loans in the most distressed credit categories require greater spreads than the higher quality credits. This represents both the reimbursement for greater direct loan servicing costs, and a higher probability that loans in that category will not be fully repaid. However, these premiums cannot be assessed at a high enough level to completely allocate loan loss reserve requirements. In addition, loans that are currently not classified in the lower quality categories certainly have the potential to be moved there at a future date, thus share some of the potential expense as well.

The driving force behind risk differentiation beyond this point appears to be the market practices of other competitors. In some districts these practices have allowed for a very broad averaging of default risk costs among all borrowers. In other districts, competitive forces, particularly on the best and largest loans, have made such an allocation process unworkable. As such, the highest quality borrowers share to a lesser degree in the costs associated with default risk incurred by the overall organization. However, it is seemingly safe to

say that a large share of the default risk costs are still shared on a fairly equal basis among borrowers, even when differentiation occurs. This results from the fact that the largest share of the borrowers are of high credit quality, so differentiation becomes difficult except for the very largest loans, which may have marketable security alternatives that provide greater differentiation.

It is also important to note that the insurance fund requirement implies a very similar risk differentiation practice to what has been outlined here. Insurance premiums are to be assessed at a level of 15 basis points on all accrual loans, and at a level of 25 basis points for nonaccrual loans.[2] This assessment strategy requires a higher premium on loans with the greatest potential of being uncollectible, thus the most difficult to extract a premium from. As a result, the question becomes one of how these costs become allocated among the borrowers who can pay.

On large loans, risk differentiation has become a major issue. These borrowers have alternative sources of credit that differentiate among good quality borrowers to a much greater extent than most lenders have traditionally done. As a result, many banks practice closer competitive market monitoring and individually negotiated pricing on

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[2]Accrual loans are performing loans on which interest is accrued and credited to interest income based upon the principal balance outstanding. Loans are placed in a nonaccrual status when circumstances indicate that collection is in doubt. While interest may still be billed, it is no longer accrued for financial reporting purposes, and generally all payments received are applied first to principal, with interest recovered later.

large loans. In these cases, the differentiation process is driven externally.

For smaller loans, where market information on risk differentiation is much more difficult to acquire, internal cost allocation practices become a much bigger issue, since they drive pricing in a market where the BCs can be more of a leader. In these markets, most of the banks have been able to pursue practices with less risk differentiation, which results in a more equal sharing of cost among borrowers regardless of credit quality. However, in some districts, banks have further differentiated these borrowers in an attempt to create incentives for financial improvement, and to generate a higher return on those loan assets to compensate for additional risk.

CHAPTER 7

THE ALLOCATION OF NET SAVINGS

The prior three chapters focused primarily on the means by which costs are allocated among borrowers by the BCs. While these issues are important for any firm in determining the profitability of a financial relationship or group of relationships, they are particularly important in the cooperative since cost allocation ultimately affects patronage refunds paid to the borrower.

Net savings in the investor-owned firm is generally evaluated from a return on assets or return on equity standpoint. While such an evaluation is certainly important, it is beyond the scope of this study. Rather, this chapter will focus on the means by which net savings is allocated among the borrowers of the cooperative organization.

The first section of this chapter will expand the theoretical discussion of patronage refunds from Chapter 1 to include a number of behavioral issues that directly affect how the member views patronage refunds. This is followed by a discussion of the pooling practices used by the BCs in determining patronage refund allocations, and consideration for earnings that are not allocated to patrons but held in unallocated reserves. The financial impact of the Agricultural Credit Act of 1987 on net savings will also be discussed.

A Caveat Regarding Patronage Refunds

In the Chapter 3 discussion on theoretical perspectives, patronage refunds were viewed as an adjustment to the initial price set by the cooperative, which ties in conceptually with the widely supported service at cost principle. Staatz (1984) puts it in terms of a contingent contract where the initial price is subject to adjustment based on the net earnings of the firm (i.e. patronage refund). However, the degree to which cooperative members hold this belief is of critical importance to the pricing issue since it will affect the "cooperative price" the member uses in comparing strategic alternatives. In addition, stock purchase requirements also need to be factored in, as in the Farm Credit System.

In this section three factors that may affect the member's valuation of patronage refunds are discussed. These factors include the uncertain amount of the patronage refund, the need for temporal adjustments, and behavioral issues regarding the way that people treat gains and losses.

Unknown Return

The contingency pricing concept that Staatz describes provides the cooperative with added flexibility in pricing in an uncertain environment. However, it increases the uncertainty that the member faces in attempting to compare alternatives. Cooperatives sometimes attempt to deal with this problem by providing members with additional information that fosters a perception of what level of patronage refunds will be declared. This may be as simple as a relative measure such as "net margins are turning out about the same as last year", to more detailed financial reporting and forecasting information to members or an

announcement of anticipated returns. The BCs have attempted to maintain consistent earnings that provide the member with some anticipation of patronage refund levels from year to year. The member must have an expectation of earnings levels to include in estimating the impact of earnings on effective borrowing costs.

An extreme example of providing the member with an anticipated refund level is the cooperative that has historically declared no patronage refund. Most PCAs and FLBs are an example of this, where all earnings have been historically retained as an unallocated surplus.[1] As a result, the member does not have an adjustment to be made to their initial borrowing rate for anticipated patronage refunds.

Temporal Adjustments

As a practical matter, the earliest possible time that a patronage refund can be declared is at the close of the cooperative's fiscal year when all income and expenses are known. In addition, in most cases up to 80% of the patronage refund is issued as a non-cash (or deferred) patronage refund that will be redeemed in cash at some later date. Much

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[1] In the case of the FLBs this is partly the result of an incentive for them to retain earnings due to their tax-free status on income, which was expanded to include the Farm Credit Banks resulting from the merger of district FLBs and FICBs under the Agricultural Credit Act of 1987. This incentive arises since earnings allocated as patronage refunds to members would ultimately be taxable, while earnings retained would not. In the case of the PCAs there is not a similar incentive since thay are subject to income tax, but the predominant practice has been to retain all earnings. The presence of retained earnings implicitly reduces funding costs since no interest or debt servicing is required, but obviously if income taxes can be avoided the amount of earnings retained would be greater.

of the portion paid in cash may in turn be required to meet the member's income tax obligations on the entire patronage refund.[2] As a result, the net present value of the patronage refund may be reduced substantially as an adjustment to the initial price if the non-cash patronage refund is not retired for a substantial period of time.

Some cooperatives have attempted to address this by giving members information that would lead to an anticipated revolvement cycle from which to evaluate the non-cash returns. Here again the spectrum ranges from cooperatives that have not retired the non-cash patronage refund to those with very specific equity retirement plans (Cobia, et.al.). The most definite retirement plan would be to actually include a redemption date on the non-cash portion, although this may severely limit the financial flexibility of the cooperative. It may also bring into question the equity treatment of stock, since a maturity date is more characteristic of a debt instrument.

The BCs have made use of board policies that state a specific equity revolvement period, although the final retirement decision is at the discretion of the board of directors. The Agricultural Credit Act of 1987 explicitly prevents any automatic retirement of stock, although

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[2]Sexton and Iskow (p. 27) note that from a member relations standpoint the cash portion of the patronage refund should at least meet the member's marginal personal income tax rate (presently a maximum of 33%) to avoid a potential net negative after-tax cash patronage refund. However, it should not be construed that the patronage refund should be adjusted for income taxes prior to considering it as an adjustment to initial price since alternatives would typically be viewed on a pre-tax basis.

that does not preclude policies that create an expectation among members.

An example of how this information on return and temporal adjustment can be made is found in Table 7.1. This effective rate calculation sheet is provided to borrowers of the Springfield BC on an annual basis for the prior year. Such a notification was required by Congress for a number of recent years, but is no longer a legal requirement for the BCs.

Note that this calculation implicitly uses the vertical integration and contingent contract views of cooperation. The billed rate is the initial stated rate the borrower is charged. This is then adjusted to reflect the required stock investment (override) for the year, and its net present value upon retirement at a projected date. The billed rate is also adjusted for the NPV of earnings distributed to members (patronage refunds) at the end of the current year in cash and upon retirement of the remainder at a future date. The billed rate and stock investment are known, but the final effective rate is contingent upon the level of earnings shown and ultimate retirement date of the stock purchased and earned.

Behavioral Issues

Another issue is the extent to which the member actually ties the patronage refund to the initial price when evaluating alternatives. For example, on most cooperative financial statements the patronage refunds are shown as either other income or a final adjustment to income, rather than as an adjustment to the relevant income or expense category. BC patronage refunds represent an adjustment to interest expense in the

Table 7.1. Example of Effective Rate Calculation Using a Contingent Contract View.

EFFECTIVE RATE CALCULATIONS DETAIL

SEASONAL BILLED RATE	7.25%
PLUS:	
1. Present value of first quarter override @ 10% of billed rate (Override % x Billed Rate x Present Value Discount Factor) (.1 x 1.8125 x .9762)	.1769
2. Net present value of second quarter override requirement (.1 x 1.8125 x .9587)	.1738
3. Net present value of third quarter override requirement (.1 x 1.8125 x .9415)	.1706
4. Net present value of fourth quarter override requirement (.1 x 1.8125 x .9247)	.1676
LESS:	
1. Present value of 25% of 1987 earnings paid in cash fifth quarter. (Earnings = 9.636% interest billed.) (Earnings Rate x Billed Rate x Cash Distribution x P.V.D.F.) (.09636 x 7.25 x .25 x .9247)	.1615
2. Net present value of 75% of 1987 earnings projected to revolve at 6 years (Q29)*. Earnings rate x billed rate x revolved portion x P.V.D.F. (.09636 x 7.25 x .75 x .5993)	.3140
3. Net present value of override projected to be revolved at six years (Q29)* (Override % x Billed Rate x P.V.D.F. (.10 x 7.25 x .5993)	.4345
EFFECTIVE RATE	7.03%

*(Revolved at month 85)

Source: Springfield BC

contingent contract view, but are not reflected as such. The only time the adjustment might be directly made is in a specific comparison of alternative sources of financing.

An additional problem may be the way in which the member views the cash flows combined to arrive at the cooperative's effective price. Work done by Tverskey and Kahneman on the way that decisions are framed (prospect theory) indicates that the response to losses is more extreme than the response to gains. As a result, the framing of a decision as a gain or loss may very well have an impact on the final decision outcome.

When the cooperative's price is greater than their competitor, the member sees this price difference as a loss (i.e., a loss incurred from doing business with the cooperative rather than the alternative). The present value of a patronage refund would be considered as a gain. The member weights the loss based on a price difference greater than a gain resulting from a patronage refund. In addition, the gain is expected while the loss is known with certainty. As a result, posted current prices may play a more important role than traditional theory would suggest.

These factors affecting the member's evaluation of patronage refunds should make it clear that competitive alternatives may often be compared by the member directly to the initial stated price, rather than the cooperative's final adjusted price. Note that in the first two factors (uncertain return and temporal adjustments) credible information provided by the cooperative may play an important role in determining what price adjustment is actually made by the cooperative in evaluating alternatives.

The interpretation of patronage refunds with respect to interest rates set by the Farm Credit System is an important issue for the BCs. The 1986 and 1987 legislation refers to "interest rates" and "competitive interest rates" in a number of sections. Since most FLB and PCA institutions do not declare patronage refunds the language is unambiguous. However, for the BCs the question of exactly what factors (if any) the initial stated interest rate is adjusted for is very important from a regulatory standpoint.

Net Savings Distribution

Once the net savings has been determined, the cooperative must determine the manner in which they will be distributed. There are three main ways that the cooperative's board of directors can distribute net savings, as constrained by their bylaws. These include payment of stock dividends based on the member's equity holdings, retaining the earnings in the cooperative, or distributing them in the traditional cooperative manner based on patronage. In addition, depending on their choice of distribution between these categories, a portion of net savings may also go to pay State and Federal income taxes. Each of these areas will be discussed briefly below.

Dividends

Dividends on capital may be distributed to members based on the equity held in the cooperative. This method of earnings distribution has been used relatively little by cooperatives in general, and rarely if ever by the BCs. There exist two primary reasons for the minimal use of dividends by cooperatives.

First, dividends and interest on capital are generally subject to income tax at both the corporate and individual level. For the cooperative this is an especially important point since earnings declared as patronage refunds are subject to tax only at the individual recipient level. The negative tax consequences of this method of distribution are a major deterrent for the allocation of earnings in this manner.

The second issue is that in many states cooperatives are limited on the level of dividend that can be paid on equity capital if they are to retain their cooperative tax status. This legislation ties back to the original cooperative enabling legislation that provided for the distribution of earnings without taxation, provided that the required return on capital was also limited.

To the extent that a member's usage of the cooperative is highly correlated with their proportional level of equity in the cooperative, patronage refunds provide a method of avoiding the income tax and still providing a similar distribution of earnings. However, in the frequent case among many farmer cooperatives where current proportional equity holdings are incongruent with current member usage, stock dividends have been suggested as a means of equalizing the member's return on the capital invested in the organization.

Base capital plans are an alternative method of equalizing returns on equity without using a dividend. Base capital plans have been implemented by cooperatives, including many of the BCs, in an effort to have member ownership of the cooperative distributed in a similar manner to member usage of the cooperative. In the base capital situation, dividends based on stock ownership are especially unappealing due to

their double taxation since a patronage-based distribution (discussed later) would provide a similar distribution with only single taxation.

Unallocated Reserves

Unallocated equity reserves represent earnings that the cooperative has chosen to retain and bear the income tax liability themselves in order to provide more permanent capital for the organization. The prevalence of this practice among cooperatives varies widely. Within the Farm Credit System, the FLBs have traditionally allocated most, if not all of their earnings to this category. This is partially a result of their exemption from income tax, which essentially makes the payment of patronage refunds or retention of earnings equal alternatives from a tax standpoint, but retained earnings a preferred alternative from a long term equity building orientation.

The Agricultural Credit Act of 1987 required the BCs, which had varying practices with regard to any unallocated reserves, to begin building their surplus and reserves. The recently updated Code of Federal Regulations, Title 12, Section 615.5330, requires that "each Bank for Cooperatives shall add to the unallocated surplus account annually in an amount not less than 10 percent of net earnings after taxes until such time as the unallocated surplus equals half of the minimum permanent capital requirements."

Earnings that result from nonpatron business are one source of net savings that is put into unallocated reserves. Significant examples within the BCs are third party leveraged leases written for the benefit of members, but required to be on a nonpatronage basis; and workout loans that may also be on a nonpatronage basis. Rural utilities that are eligible to borrow from the bank, but are not cooperatives, also do

business on a nonpatronage basis. Legislation does provide for the BCs to do business on a nonpatronage basis with members, but this is not currently being done. Only one district indicated that they had written some "partial patronage" loans where their margin was so thin that they did not feel it was equitable to provide full patronage on that business. Earnings generated from these nonpatronage transactions can be used to partially or completely fill the 10 percent requirement of the legislation. In addition, banks may choose to allocate a portion of their patronage sourced earnings to unallocated reserves, as well.

Patronage Refunds

Patronage refunds are paid to members based on some measure of the level of business that was done with the cooperative during the year. In the BCs, the prevailing measure is the amount of gross interest paid by the borrower, although two banks indicated using average gross loans outstanding for the year as the measure. One bank also indicated an interest in considering the use of net interest margin (gross interest less the cost of funds) as the measure since it would avoid weighting as a result of the absolute interest level of any given loan, although they have not implemented such a program.

A major issue is the basis on which members are to be grouped for patronage refund declaration purposes. The simplest and most common method is to use a single patronage pool, where the net savings from patronage-sourced revenue less patronage-sourced expenses is distributed on an equal basis among members based on their level of business (as determined in the prior paragraph). With this method, the only allocation issue is one of determining what level of expenses should be charged against nonpatronage-sourced income, and this is usually no

major problem since it represents a rather small portion of total business volume. Use of a single pool results in averaging the net savings generated on business among all patrons equally.

If Knutson's concept of equal net margin pricing is employed, it is implicitly a very fair method of distributing earnings. However, if returns on business with specific groups of borrowers vary consistently from returns from other groups of borrowers, the argument has been made that single pools do not result in a fair and equitable distribution of earnings.

In order to resolve this fairness problem, the concept of multiple patronage pools has been used by some cooperatives. While multiple pools help resolve the problem of differing rates of return among different groups of borrowers, it creates a problem of determining an equitable manner to allocate expenses between the pools, particularly overhead expenses that cannot be directly attributed to individual borrowers or groups of borrowers.

Recent regulatory revisions to implement the Agricultural Act of 1987 speak to this issue in the following manner: "(3) Any patronage refunds that are paid shall be paid in accordance with cooperative principles, on an equitable and nondiscriminatory basis determined by the board of directors in accordance with the capitalization bylaws, provided that any earnings pools that may be established for the payment of patronage shall be established on a rational and equitable basis that will ensure that each patron of the institution receives its fair share of the earnings of the institution and bears its fair share of the expenses of the institution." (12 CFR Section 615.5230B)

BC Pooling Practices

The predominant practice of the BCs is the use of a single pool, which ten of the twelve district banks indicated had been their practice. Among these ten, the only deviations were one district that indicated fully government guaranteed loans had been offered on a nonpatronage basis since the spreads are so thin; and another district that had offered a number of loans as "partial patronage" where only a portion of the patronage was paid on the transaction for the same reason. The two remaining districts, Columbia and Louisville, have made use of multiple patronage pools, and the Central Bank also uses this concept. Each of these will be considered individually.

Columbia has used multiple pools based on five or six product classes for the past six years. These pools were focused on differential patronage rates based on differences in the cost of funds only, since operating costs were allocated on a strictly pro-rata basis. Examples of the pools used would be fixed seasonal, fixed term, variable seasonal, variable term, participation loans, etc. As a practical matter, the variable rate pools have shown losses for five of the six years that multiple pools have been used, since the rate charged on loans in those pools is constrained by competitive market pressures, while the cost of funds within those pools was a result of prior funding decisions. These pools are also quite small, which makes them more difficult to manage, as well. As a result, those pools showing losses paid no patronage refunds, and losses in those pools had to be offset against profits in other pools prior to patronage being paid on them, as well. They will be dropping the multiple pooling practice when they join the National Bank for Cooperatives in 1989.

Louisville made use of nine patronage pools prior to 1988 based again on loan products. Operating expenses were allocated between pools on a pro-rata basis, but the actual cost of funds for each pool was used for funding allocations. Those variations are reflected in the patronage refunds paid on these pools specified in this manner. It was believed that this allocation method worked fine at the time, but once a differential pricing program was implemented the pools were deemed unnecessary. Differential pricing allowed for loans to be priced initially to compensate for differences in funding costs, so that the net savings was more equal across loan products than in the past. As a result, during 1988 they returned to a single pool.

The Central Bank for Cooperatives has made use of patronage pools for each of the twelve districts, as well as a separate pool for international lending transactions that are done on a nonpatronage basis. District pools reinforced the concept of the CBC as a true vertical integration of each of the district banks. This pooling practice serves as an effective means to make districts accountable for pricing decisions on participation loans. CBC allocates funding costs to the district pools based on the implied cost of funds in the market on the date the loan is booked. The cost of funds is generally well defined since nearly all of the CBC loans are priced on a fixed rate basis, for which there is easily available information on what the funding costs would be on a daily basis. Operating costs are allocated on a pro-rata basis, based on loan volume. From the data available in the exhibits for the consolidation proposal it appears that the CBC was allocating operating costs of between 32 and 33 basis points against the district pools.

The pricing structure of the CBC almost necessitates the use of district pools from a fairness perspective. Since each of the districts price participation loans themselves, CBC has only the choice to either accept or reject the loan based on that pricing. As a practical matter, the relationship is one of ongoing consultation where CBC is either satisfied or not with the manner in which districts price loans, although it was indicated that loans have been rejected based on the pricing proposed.

The district pools bring financial accountability for those pricing practices directly to bear on the level of patronage refunds that will be received on any given participation. Since loan characteristics, competitive pressures, and individual pricing practices differ between districts one would expect that the actual patronage refunds paid would vary as well between districts. Exact data was not available, but the patronage allocation levels are implied by the relationship between patronage refunds received by the district banks and their level of participation loans. Table 7.2 outlines these implied patronage refund levels that vary from a low of 81.5 basis points, to a high of 182.9 basis points. The differences in patronage refunds, which implies smaller spreads, may be somewhat correlated with competitive conditions since the Springfield, Sacremento and St. Paul districts have been considered to be under highly competitive market conditions. In addition, the average loan size of the largest commitments at St. Paul and Sacramento are also larger than some of the other districts.

Table 7.2. Implied CBC Patronage Allocation Levels for 1987 (Millions).

DISTRICT	Average Gross Loans	Participations %	Participations Volume	Patronage Refunds Received	Implied Patronage Refund Rate
Springfield	383	69%	264	2.15	0.81%
Baltimore	156	69%	108	0.93	0.86%
Columbia	506	62%	314	4.12	1.31%
Louisville	624	39%	243	2.85	1.17%
Jackson	886	64%	567	6.32	1.11%
St. Louis	382	22%	84	1.31	1.56%
St. Paul	1,464	42%	615	5.73	0.93%
Omaha	328	11%	36	0.47	1.29%
Wichita	541	31%	168	2.52	1.50%
Texas	231	36%	83	1.52	1.83%
Sacramento	742	40%	297	2.98	1.00%
Spokane	315	33%	104	1.25	1.20%

Source: Special Committee on BC Structure, 1988.

The use of patronage pools still does not deal with all equity issues since an arbitrary allocation still is necessary to allocate overhead costs between districts. This point was brought out clearly by Mark Soukup from the Springfield BC, who noted that CBC operating expense allocated to their bank for 1987 were $864,000, but that the actual costs incurred by CBC to service their loans was quite small. He noted that they had only five participation loans, all of which were in a strong financial position, and that CBC had very little direct involvement. In contrast, some of the other districts had participation loans with much higher servicing requirements by CBC, resulting partly from lower credit quality and loan administration. Essentially, his argument was that the allocation of operating expenses on a pro-rata basis based on loan volume was not a "fair" practice.

Another issue to note is that even in pooling situations, when an individual pool incurs some loss, it is a common practice to offset those losses on a pro-rata basis against profits in all other pools. As

a result, losses are shared on a pro rata basis, while gains accrue only to the specific pool.

The Agricultural Credit Act of 1987

The Agricultural Credit Act of 1987 will have a significant impact on the potential profitability of ongoing Farm Credit System (System) institutions. While the Act provided an immediate show of support in the bond markets, the ultimate cost of the assistance will fall on all Farm Credit institutions. The Act simply provided a funding mechanism during the interim until the system could repay the cost.

The explicit costs that each bank will incur as a result of the Agricultural Credit Act of 1987 will be outlined below. The primary costs will be discussed within two major categories - financial assistance and insurance assessments. A discussion will then consider how the costs are ultimately distributed to the borrowers of the System.

Financial Assistance Corporation (FAC)

The FAC was established in early 1988 as mandated by the 1987 Act to administer financial assistance as directed by the Farm Credit System Assistance Board. The Assistance Board consists of the Secretary of The Treasury, the Secretary of Agriculture and an appointed agricultural producer. The Assistance Board is charged with certifying institutions that will receive financial assistance through the purchase of preferred stock. However, these decisions are put into action through FAC. There are three primary components to the costs that FAC will impose.

First, the 1987 Act provided for a one-time stock purchase assessment. District banks with unallocated retained earnings in excess of five percent of their total assets, and associations with unallocated

reserves in excess of thirteen percent of their assets, were required to purchase an amount of stock in FAC equal to the excess. For financial reporting purposes those assessments were expensed during 1988. Unallocated reserves were high enough in some BCs to result in an assessment; however, the total amount was not substantial.

The second form of assessment from FAC is related to financial assistance accrued through the third quarter of 1986 under Capital Preservation Agreements, and subsequently assumed by FAC. These assessments totalling $415.4 million were never actually collected due to ongoing litigation. FAC was required by the 1987 Act to assume these assessments. Subsequent to this, FAC directly funded these assessments through debt issuance. The interest cost on this debt issuance will be assessed back to System institutions based on their proportionate share of System loan volume. If loan volume of $50 billion and a debt cost of nine percent are assumed, the cost of these assessments will be approximately seven basis points per year on all accruing loan volume. In addition, when the bonds used to fund these transactions mature in fifteen years, the System will be responsible for principal repayment as well, a one time cost of approximately 83 basis points (based on the $50 billion loan volume assumption).

The third form of assessment is related to preferred stock purchases that FAC would make after the Assistance Board had certified the necessity of this capital infusion to keep a system institution solvent. FAC can issue up to $4 billion in debt to fund these preferred stock purchases. This debt is uncollateralized, but the payment of principal and interest is guaranteed by the Secretary of the Treasury. These obligations have maturities of fifteen years and can be issued

through September 30, 1992. Interest is funded for the first five years by the Secretary of the Treasury; allocated between the Secretary of the Treasury and the System during the second five years; and paid entirely by the System during the final five years of each obligation's term. However, the system is ultimately responsible to repay any interest funded by the Treasury. In addition, the principal may be assessed to all system institutions, based on the purpose for which the funds were used and the ability of FAC to liquidate their preferred stock investments. It will be some period of time before the magnitude of this potential liability will be known since FAC has made few actual stock purchases up to this point. In addition, since the Secretary of the Treasury is meeting the interest payments for the first five years of those obligations, the ultimate cost is deferred for some period of time. It is the general sentiment that the total amount of the assistance that will be required will be substantially less than was anticipated originally. In the final evaluation, there will no doubt be some cost with respect to these obligations, but the actual amount is impossible to determine at this point in time (see Bullock and Dodson for additional systemwide issues).

In summary, the on-going FAC cost to System borrowers will be a minimum of seven basis points per year for the next fifteen years, as well as an estimated assessment of 83 basis points in the final year for principal repayment. Additional potential liabilities may exist for FAC assistance provided to institutions in the coming years, but the actual cost would be impossible to estimate at this point in time.

Farm Credit System Insurance Corporation

The second major cost will be related to the Farm Credit System Insurance Corporation, established as a part of the 1987 Act as well. The purpose of this insurance fund is to ensure the timely payment of principal and interest on consolidated systemwide obligations (see Chapter 4). Annual premiums are mandated in the 1987 Act at a level of fifteen basis points on accruing loan volume, and twenty-five basis points on nonaccruing volume. The first assessment will be based on the average volumes for 1989, with payment to be made in 1990.

The insurance fund will become available to meet these obligations beginning January 1993, essentially after FAC can no longer issue new debt for direct financial assistance to accomplish the same purpose.

Implication for the BCs

These provisions in the 1987 Act will result in a minimum additional cost of twenty-two basis points (seven basis points from FAC related to 1986 Capital Preservation Agreements, and fifteen basis points of insurance) on all accruing loan volume. One of the most notable things in these assessments is that they are to be done on a pro rata basis. In other words, a strict average cost pricing rule is being used with respect to assessments. This may be of significant concern to the BCs that have been very sound financially.

This assessment process is of particular interest in light of the discussion of differentiation based on credit risk in Chapter 6. While individual firms in the market are seen to be increasingly sensitive to risk differentiation, the assessment process invokes quite the opposite incentives on System institutions. A key factor of concern for strong

institutions in the future will be their ability to be competitive given the additional assessments all will be subject to.

Conclusion

Pricing, cost allocation practices, and pooling practices are integrally related issues for the cooperative. Each has little meaning individually since the others influence the cash flows related to any patronage-based transaction with the organization.

The pricing objective of the organization is required to be at competitive market rates. If multiple pools are used, cost allocation practices determine what type of return the member will receive on their investment in the cooperative in a firm-oriented method of analysis and the effective rate the member pays in a vertical integration orientation of analysis. If a single patronage pool is used, then cost allocation rules are important only to the extent that they influence the overall pricing structure, which may affect the market rate offered, since net savings is implicitly distributed on an averaging basis with a single pool. This has been the approach predominantly used by the BCs.

This approach is simplest from an accounting perspective and is conceptually easy to understand. However, it relies on market prices being a very good indicator of costs, which may be reasonable over the long run in competitive markets. Yet, highly competitive situations for short term loan volume may not be the best indicator since costs may not actually be covered, as interviews confirmed. Making a loan under these circumstances results in a very clear case of other members subsidizing the given member.

Market-oriented pricing with the use of a single patronage pool also closely aligns with a firm-oriented return on member investment orientation for evaluating cooperative investments. Given the fact that most districts have used base capital plans or are moving in that direction, this analysis may be appropriate for the borrower since capital levels are more closely aligned with actual usage of the cooperative.

The use of multiple patronage pools with a product orientation would appear to have little merit given changes in the way in which the cost of funds is reflected in pricing. Patronage pooling in this manner represented an ex post adjustment to price since funding costs were not as well matched with the assets being priced. However, with the current practices that price off of marginal funding cost, price adjustment is made in an ex ante fashion so that ex post adjustments are minimized.

Given the high levels of overhead costs in banking that would ultimately need to be allocated for multiple pooling based on other criteria, it does not appear to be a reasonable alternative. The advantages of being able to declare differing patronage levels are gained, while the problems surrounding cost allocation decisions for overhead then become the issue. In addition, for borrowers that are very rate sensitive, it provides preferable incentives to price to market initially, and then reflect the benefits of cooperation in an ex post fashion through patronage refunds.

CHAPTER 8

SUMMARY AND CONCLUSIONS

The BCs have undergone many changes in business practices since their inception over fifty years ago. Change has been necessary to meet the needs of cooperatives that have grown dramatically in size, and to survive in a changing market with a growing number of competitors interested in serving the financial needs of agricultural cooperatives. The challenge to the BCs has been to adapt to this changing environment while maintaining their continuing commitment to cooperatives, and functioning as a cooperative themselves.

The purpose of this chapter is to summarize the conclusions that have been reached in this work. The first section will summarize some of the general transitions that have taken place in the BCs that have an impact on their pricing policies. The next section summarizes conclusions reached regarding the individual components that eventually lead to an overall price (i.e., interest rate). The final section raises areas for future research.

Transitions

The history of the BCs has reflected a great degree of refinement in pricing practices. Initially a very limited number of administered loan rates were set with virtually no differentiation among BC borrowers. Eventually rates began to reflect differences in loan

purpose, and individual district costs. In recent years these differences have been brought all the way down to reflecting differences in costs at the individual loan level. In addition, the loan products offered have increased dramatically, necessitating a more complex approach to pricing. These changes are also a reflection of the system moving from a regulator with very heavy involvement in its management, to what is now envisioned as an arms-length regulator.

This greater differentiation in the pricing of loans is paralleled by a reassessment and redefinition of some basic cooperative philosophies. In the simplest analysis, it represents a movement to assessing added costs to the user rather than averaging costs across users. Philosophically it is a movement from an equal treatment approach to one of equitable treatment. The original equal treatment approach necessarily involves a redistribution of wealth since the cost to the cooperative of any given transaction can vary greatly, depending on many factors. Current pricing practices attempt to more closely reflect some of these differences in cost. In addition, by more closely reflecting these differences in cost, the pricing of the BCs tends to reflect market rates more closely as well.

Increasing development of the financial system has forced the BCs to become more market driven. For many years the agency status of the Farm Credit System provided the advantages of virtually unlimited access to funds in the capital markets, at very favorable interest rates. This positioned the system to have some distinct advantages over other lenders in the past. However, the current environment provides relatively open access to the financial markets to a much broader group of constituents, including some of the BC's own customers. In addition,

the system has lost some of its advantage from agency status due to the financial difficulties of some institutions within the System and the resulting financial assistance required and insurance fund assessments. These additional costs and the broader direct access to financial markets places the BCs in the midst of a very competitive market. In addition, it is a market that differentiates a great deal between rates offered to participants.

This summarizes the general environment in which pricing decisions must be made. The following section will summarize the conclusions with respect to individual cost components that are reflected in the pricing practices of the BCs.

Pricing Components

Cost of Funds

The manner in which the cost of funds for any given loan is defined has a substantial impact on the ultimate rate of interest required to cover the cost of the transaction. The traditional approach used was to employ a very strict average cost pricing rule, through the use of funding pools. Loan rates were adjusted based on the average cost of funding a particular type of loan (i.e., seasonal or term) and the borrower faced an immediate reflection of the cost of participating in the pool through their interest rate. From a practical standpoint, in stable markets this approach did not differ greatly with respect to the final rate charged to the borrower from what a marginal cost rule would provide. In fact, it provided some stability to rates that was immediately passed on to borrowers.

The problem that arose with this pricing rule was most evident in the volatile financial markets in the early 1980s. In this type of a market the pool price tends to lag the market on both increases and decreases. As a result, the borrower has an incentive to join the pool on an upward trending market and leave the pool on a downward trending market. This tends to dilute any stabilizing effect the pool might have for its ongoing participants. In addition, it may create some perverse incentives for the borrower who may either invest or disinvest based on the differential between their interest rate and current market rates.

Two solutions to this problem have evolved. First, there has been a substantial increase in the use of fixed rate loans that are funded either directly or indirectly by like maturity debt instruments, and generally priced directly off the instrument as well (i.e. marginally priced). This provides the bank and the borrower with greater certainty with respect to pricing and interest costs, and has been of particular interest to the largest borrowers for quite some period of time. There has been increasing use of asset liability management techniques that make it easier to provide fixed rates for smaller transactions with greater choice among possible maturities. At the present time the vast majority of the BC portfolio is on a fixed rate basis.

The second funding solution has been to price the variable rate products in a marginal cost manner off of current market rates. Various BCs continue to make some allowance for average pool cost, but most focus on some relationship to prime, which is easily understood by most borrowers. A positive impact of this approach is that it removes any perverse incentive that the borrower may face due to an average pool cost varying significantly from current market rates. The borrower

still ultimately feels the effects of these differences through the patronage refund received, since the bank should be either more or less profitable based on how closely the funding costs follow the current market. Since any benefits gained through funding are uncertain and received on a delayed basis, the possibility of their having a major impact on investment or disinvestment decisions is reduced. However, since most banks operate on a single pool with respect to earnings allocations, these benefits are distributed over all borrowers - both the fixed and variable rate users.

Movement to marginal cost pricing off of current market rates may also encourage more direct comparison by BC borrowers with alternative sources of credit. The direct rate comparison becomes more transparent as BC rates move with other lenders' rates, rather than being averaged over time by BC pool funding practices. This places more pressure on the BCs to generate strong profitability that must then be the source of their competitive advantage offered to borrowers through patronage refunds. In addition, other advantages the BCs may offer through more tailored products, specialization within financing agricultural cooperatives, representation in management through the board, and so on, will need to be communicated well to borrowers. The more stable rate that lagged the market through average cost pricing no longer provides an immediate advantage to the borrower.

The borrower is ultimately forced to make a decision on moving to fixed rate products as an alternative. For smaller borrowers this may pose a problem since it will be difficult for them to diversify their funding costs very effectively. An alternative approach may be to provide a pooling option, but strategically include entry and exit

limits with adequate penalties in place to avoid problems related to incongruence between pool and market costs. This would provide the opportunity for smaller borrowers to make use of the bank's funding expertise and to diversify debt costs better than they could individually.

It is imperative that the best asset liability management techniques currently available be employed in managing the funding of the BCs. The threatened viability of the FLBs, and savings and loan associations are vivid examples of the potential magnitude resulting from inattention to this area. While the problem has not been nearly as severe in the BCs, the financial information shows that it exists in some banks. In addition, commercial banks that are direct competitors have dedicated a great deal of resources to developing improved ALM techniques in order to reduce their exposure to interest rate risk, and to improve profitability. Given the competitive financial market of today this must be an area of emphasis.

Operating Expenses

One of the most significant issues of interest in looking at operating expenses is the fact that banking exhibits economies of scale with respect to loan volume. There is a great deal of fixed cost involved from an organizational standpoint, and even from an individual borrower standpoint. In a very real sense, operating costs provide the borrower access to credit and some level of financial expertise, since the marginal operating cost of borrowing an additional dollar is extremely small once the lending relationship has been formally established.

There seems to be a fairly clear distinction within the BCs between what are considered large and small borrowers in allocating operating costs. The direct costs of servicing lending relationships to the largest borrowers are substantially smaller on a per dollar borrowed basis than those associated with the smallest borrowers. The distribution of loan sizes is such that there is a rather extreme difference between large and small borrowers, which makes differentiation on this basis much easier. Some cost accounting work has been done within various districts that confirms this notion as well. However, allocating direct costs at some point also becomes a very arbitrary process since there are such great economies available once the lending relationship is arranged.

The theory would suggest that as a cooperative it would make sense to use a fee structure that attempted to cover overhead costs (or fixed costs) based on some measure of anticipated usage, which would allow for marginal cost pricing of actual loan usage. As a result, the borrower would make a decision based on true marginal cost. In practice, very few fees are used by the BCs, which means that the vast majority of the overhead costs are assessed through interest charges (i.e., on a per unit borrowed basis). It is also worthy of investigation since the banking industry in general has moved increasingly to the use of fees, which would make the transition for the BCs somewhat easier. The difficult question becomes one of choosing an allocation rule that is considered fair, since any overhead cost allocation rule is necessarily arbitrary.

Recognition must also be given to the fact that pro-rata sharing rules are not the only arbitrary overhead allocation rule possible.

Such a strict rule may preclude the bank from transactions that contribute to overhead coverage, but not at a pro-rata level. This may be particularly true of large, high quality loans priced under very competitive conditions. Other lenders are unlikely to be bound by a pro-rata sharing rule, ultimately giving them the pricing advantage in these transaction.

Pricing for Credit Risk

There are two primary costs associated with credit risk. The most easily defined and attributed is the additional staff time required to monitor loan performance on riskier credits and to potentially liquidate those assets. The more difficult cost to anticipate and assess is the actual loan losses incurred by the institution. These losses are uncertain as to their amount, and carry a temporal dimension. In addition, the ultimate party to which the loss can be attributed cannot be assessed once the cost is known. Some of this problem may also be relevant for even recovering additional direct costs. As such, these costs carry some of the same attributes as overhead costs discussed earlier.

Practices followed in the competitive market are particularly important with respect to this component. Specifically, the largest borrowers who have access to commercial paper are subject to much greater differentiation with respect to credit risk so that the very best borrowers may be able to get better funding rates, while others may pay lower rates than in the competitive market. In addition, competition for short term loan volume in some markets also makes it difficult to assess premiums for credit risk since the market tends to

show less risk differentiation for short term issues because they are rapidly liquidated.

With smaller borrowers there appears to be greater latitude in assessing for default risk, since the BCs tend to be more of a leader in this market. As a practical matter most of the BCs have actually pursued the opposite philosophy and opted for more equal sharing of the default risk cost among these borrowers, regardless of credit quality. However, some BCs have made use of their ability to pursue greater risk differentiation where possible in order to provide incentives for the borrower to improve financial performance.

Another issue in assessing credit risk is the measure actually used in evaluating loan quality. The Uniform Classification System used by the FCA examiners is asset based, and as such simply evaluates the asset value of the loan at the present time. Such an approach does not necessarily anticipate future financial problems since it is focused only at the loan asset, not the borrower's overall financial position. As such, some of the banks have implemented a second borrower classification system that provides a better temporal assessment of the potential for future loan losses on a given borrower. As a result, this system serves as a better coordinating mechanism in that it anticipates problems and provides incentives to the borrower to correct those problems without actually incurring a loan loss.

Generally, the financial markets have become increasingly sensitive to the potential for default risk and assessed premiums where necessary. The BCs have tended, partially due to their high credit quality, to use much more of an averaging approach to dealing with credit risk, since most base any differentiation on this point on the UCS classification.

If interest rates are to serve as a better coordinating mechanism for member debt usage decisions, it would be prudent to consider greater differentiation for credit risk, particularly if a good forward-looking risk assessment tool is available. Such an approach would not only generate additional revenue to cover the costs of potential default, but would provide an incentive to the borrower to improve their financial position.

Net Savings Allocation

As a cooperative, any net savings of the BCs remaining after all other costs are covered is distributed to the stockholders, the same parties who have patronized the organization. Prior to distributing earnings directly to the stockholders based on their patronage of the cooperative, the board of directors can declare a stock dividend and/or earnings to be retained in an unallocated reserve after any income tax liability is covered. As a practical matter the BCs have made little to no use of stock dividends as a means of distributing earnings, opting in favor of allocating most earnings on a patronage basis.

The BCs have been moving towards retaining and paying income taxes on a greater share of earnings in order to build unallocated reserves. The Farm Credit Act of 1987 requires that institutions begin building unallocated reserves as a part of meeting permanent capital requirements. Over time the building of unallocated reserves should reduce the reliance on required borrower stock purchases, and to some degree non-cash distributions of earnings.

The vast majority of BC earnings are allocated to the current borrowers based on their patronage in the prior year. The most common

measure of use is the amount of interest and fees paid during the prior year.

Cooperatives can make use of separate patronage pools that allow for differing levels of patronage refunds to be declared to the membership, based on the profitability of that particular pool. Two districts make use of multiple pools, as well as the CBC. Under the new structure with the National Bank, that organization will continue to use patronage pools tied to the former district lines for at least a transitional period as well. One of the problems that always arises with multiple pools is developing an overhead allocation rule that is considered fair by all. Any rule is necessarily arbitrary. The most common rule used is basing an allocation on a pro-rata share of volume.

From the borrower's perspective, their total relationship with the BC includes not only funds borrowed and interest paid, but also a stock investment and patronage refunds. A traditional vertical integration analysis would relate all these cash flows together to come up with some effective rate, considering the patronage refund as a form of contingent contract. However, from a behavioral standpoint the borrower has some difficulty accepting this analysis. In order to encourage this analytic approach, the BC has typically provided some very direct communication to explain the effective rate calculation to the borrower.

The alternative analysis would be to consider the lending relationship as a simple market-oriented approach to financing, where the borrower is only considering the stated rate. Cash flows related to stock investment and patronage refunds is evaluated separately in a return on investment analysis.

The National Bank and the St. Paul BC are both moving fairly rapidly towards base capital plans that readily facilitate this type of analysis. Under a base capital plan the borrower's investment is related directly to their level of borrowing, generally based on some average of prior funds usage. Since patronage refund levels are related to current funds usage, the stock investment and patronage refund are matched well enough to make a return on investment calculation a reasonable approach.

The latter approach is also fairly congruent with the management practices that many BCs have moved towards. Their practice is to price as close to the market as possible, and to operate as efficiently as possible. Essentially they are maximizing profits similar to an investor owned firm, only with a slightly different equity and earnings distribution structure. If this is an approach the borrower is willing to accept, with the base capital program it may be reasonable. The concern raised in the theory is that the organization may not be able to do as good of a job optimizing the potential benefits available to members by approaching operations in this manner. By operating with a simple profit maximization objective, the organization may miss opportunities to meet more specific needs of its cooperative owners. A broader optimization objective may include offering some services of particular need to cooperatives that may only cover marginal costs, resulting in a "loss" if pro-rata overhead coverage was required.

The cooperative board structure of the BCs provides the potential for improved information flow between management and the members. As an example, by being a cooperative itself the BC may be able to provide more useful programs to its members and better financial advice for

them. This may ultimately lead to stronger profitability and a better return on investment than might be possible for other potential opportunities. In addition, if the cooperative has fewer problems with moral hazard due to its borrowers also being owners, some benefits may be gained that would eventually accrue to the membership through greater patronage refunds.

The Current Environment

Reorganization of the BCs

Much of the information for this study and the analysis that followed was based on the BCs as they have traditionally been structured, as 12 district banks and the CBC. The structure changed substantially on January 1, 1989, when the National Bank for Cooperatives was formed from 10 of the existing districts and the CBC. In addition, all have national charters.

The remaining Springfield, St. Paul, and the National BCs are individually different in their size, both in loan volume and borrower numbers. Respective average gross loans outstanding during 1987 were $383 million, $1,464 million, and $5,766 million (individual entities combined). Likewise, borrower numbers as of December 31, 1987 were 100, 674, and 2441. There exists a great deal of potential for differences in the way that each may operate when viewed in the context of the theoretical views of cooperation and the realities of the cost characteristics presented in this study.

The National BC is in part the result of earlier studies initiated by the BCs to examine the potential scale economies gained from a larger organization. The Hopkin, et.al. study outlined in detail in Chapter 5

was completed prior to the merger vote mandated by the Agricultural Credit Act of1987. The biggest single factor driving the formation of a National BC was the belief that an organization of this size was necessary to gain the economies needed to compete in the current environment. Given its shear size in customer numbers and geographic scope, it becomes difficult to visualize it conceptually as a vertical integration of its members. While the 33 member board of directors will provide a broad representation of the diverse membership, the resulting entity will more closely match the conceptual model of the investor owned firm. Given its size, competitive interest rates are likely to be the major element of comparison, with return on investment being a measure of performance as well.

The Springfield BC represents the opposite end of the theoretical spectrum. It is small in relative terms, but very efficiently run. During 1987 it was seventh largest in gross loan volume, but only fourth in operating expense per unit volume, well below the fifth ranked bank. Their small borrower numbers makes them very sensitive to member needs, and also the impact of the bank's costs and policies. As such, Springfield much more closely represents the vertical integration view of cooperatives. The early implementation of differential pricing to more closely reflect actual costs incurred as an extension of the cooperative member serves as an example of this. The costs attributed to each borrower's share of the business are more accurately identified and covered. Springfield's long term success may be very dependent on their ability to efficiently fill this role. Holding the coalition together may be easier due to their smaller size, but their opportunities may be more limited as well.

The St. Paul BC falls somewhere in the middle of this spectrum. Its greater sized should provide for scale economies, as already evidenced by their low operating costs per $100 of loan volume. The operating costs relative to the National BC will be dependent on the actual shape of the cost curve over substantially larger volumes, since the available cost data on the BCs obviously does not include an institution the size of the National BC. If the curve is relatively flat the costs may not be substantially different. In addition, its much smaller size and management structure may provide more efficient decision-making ability and response to customer needs. Keeping the coalition together will be an important issue here as well with a more diverse membership, and the necessity of maintaining adequate loan volume to assure scale economies.

Long Term Survival

If the BCs are to be a long term survivor, particularly in light of the added costs of the Agricultural Credit Act of 1987, they must provide something that makes a difference to the membership in addition to being competitive.

A key issue is the equity structure and resulting accountability it provides to the membership. Not only is the member's stock at risk, but the effective interest rate (alternatively the return on member investment) is at risk since earnings are distributed to the borrowers. This provides more accountability than alternative equity structures that place their emphasis on retained earnings. For borrowers of much of the rest of the Farm Credit System, savings and loan associations, credit unions, and many other cooperatively organized lenders that do not allocate earnings, this discipline does not exist. There is no

secondary market to create this discipline in cooperative stock, implicitly valuing retained earnings. Without this accountability the political aspects of decision-making begin to overshadow the economic impact of the organization on its membership. It is imperative that accountability be maintained.

The BCs also provide both expertise and financial products tailored to the unique needs of agricultural cooperatives. Their ability to understand and deal with extreme seasonality in asset levels and cooperative marketing pools are examples of these unique needs. In addition, they may be able to serve a coordinating function in situations where cooperative borrowers comprise a large share of a market, particularly within a specific geographic area. For example, an important coordination function with respect to fixed asset investments could be served to prevent overbuilding and the resulting financial distress. However, their success is highly dependent on strong working relationships, a high penetration in the given area, and the lack of other lenders willing to fund excess projects.

Tailored products that make use of pooling techniques that cooperatives understand may be another opportunity for the BCs. Cooperatives understand pooling concepts that reduce the extreme fluctuations the individual member may be subject to, and the BCs may be the unique lender that could provide this opportunity to its borrowers.

An investment in the BC can also provide a means of diversification for the cooperative. The BC stock represents a diversification into banking, with the return on investment considered from a firm-oriented earnings optimization perspective. There is also the added benefit of

acquiring products and services that are more tailored to their needs, as in a vertical integration analytic approach.

However, these unique features must be served while maintaining competitive pricing to avoid member defection. Given the presence of scale economies, it is imperative that adequate volume be maintained. In addition, any new activities and business volume that can contribute to covering overhead costs will benefit all members. Legislation in recent years has provided additional opportunities for business volume in rural America, including some non-cooperatives. These opportunities need to be seriously pursued where they can contribute to overhead costs.

Future Research

The last area of discussion regarding capitalization and overall return on equity is an area where further investigation would be especially useful. In the current very competitive environment, it is an important question as to what additional benefits the BCs provide as a unique source of credit for cooperatives. This is particularly true given the additional costs imposed by the Agricultural Credit Act of 1987. Future research specifically focused on these costs would also be of value to the system and its cooperative members.

Another area for future research would be to focus on the potential value of offering specific controlled pools for smaller borrowers wishing to diversify their funding. It would appear that the BC could provide these borrowers some valuable financial advice by managing their debt needs in a pooling format that would directly return the benefits of pooling to those members, rather than to the organization as a whole.

Other possibilities might include pools based off of specific indexes that provide a market basis for pricing and give the BC a structured pricing goal to achieve. Index examples might include LIBOR, one year rolling average debt, etc. However, the control of entry and exit would have to be strong enough to ensure that the pool members would remain with their commitment.

APPENDIX

APPENDIX

LIST OF BC EXECUTIVES CONTACTED

Mark Soukup, Springfield Bank for Cooperatives

Porter Little, Baltimore Bank for Cooperatives

W. Dan Groscost, Columbia Bank for Cooperatives

Keith Applegeet, Louisville Bank for Cooperatives

Gary Dorminey, Jackson Bank for Cooperatives

Roland Rexroth, St. Louis Bank for Cooperatives

Stuart Peterson, St. Paul Bank for Cooperatives

Ken Hide, Omaha Bank for Cooperatives

Greg Somerhalder, Wichita Bank for Cooperatives

Don Thornton, Texas Bank for Cooperatives

Edward Nishio, Sacramento Bank for Cooperatives

Gary Jurgensen, Spokane Bank for Cooperatives

Bob Satrom, Central Bank for Cooperatives

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