BLURRED VISION:
CHALLENGES IN
CREDIT UNION
RESEARCH AND MODELING

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The Filene Research Institute is a non-profit organization dedicated to scientific and thoughtful analysis about the future of consumer financial services and credit unions. It supports academic and independent research efforts that will ultimately enhance the well being of consumers. The Institute believes that quality research is an invaluable aid in improving managerial and public policy decisions. Research can assist credit unions in adapting to rapidly changing economic, legal, and social environments. The name of the Institute honors Edward A. Filene, the "father of the U.S. credit union movement." He was an innovative leader who relied on insightful research and analysis when encouraging credit union development.

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Credit unions have been under-researched despite their growing role in the U.S. financial system. Now they face a rapidly-changing, highly-competitive environment, thus creating a compelling need for additional research about credit unions. Professor George Overstreet and Geoffrey Rubin's monograph has the broad goal of fostering better credit union operations. It explains how credit unions differ from other financial intermediaries, reviews previous academic studies and suggests opportunities for meaningful future research. As noted by the authors, "Decision makers tend to make more informed choices when they have a framework within which to ponder the consequences of their actions. A robust set of theories will provide such a framework."

This monograph serves as an introduction to academic work on credit unions, thus introducing credit union members to this form of research. It illustrates how academic research is an ongoing process of testing ideas and generating controversy which leads to new and refined perspectives on key issues. In addition, it also provides an overview for other researchers, hopefully encouraging them to become involved in this important research area.

The authors find that both theoretical and empirical work on credit unions is very limited, relative to the enormous body of research on other financial institutions. These not-for-profit, mutual organizations do not fit easily into standard models of the profit-maximizing, shareholder-owned firm. Consequently, problems are encountered in drawing practical conclusions from existing theory. The authors suggest that agency theory, which broadens the traditional "theory of the firm," offers one promising avenue for overcoming some of these difficulties.

Only a well-developed body of research, drawing from many disciplines, will lead to the practical results that credit unions need to survive and prosper in the coming decade. No single research project ever gives us the ultimate answer to any issue. At its best, a research study provides new insights into an issue and generates interest on the part of other researchers. Such open discussion, research, and sometimes controversy generates the type of synergism by which issues are better understood, resulting in better long-range planning decisions.

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Table Of Contents

Introduction ....................................................... 1

Chapter 1
Credit Union Characteristics ............................... 3

Chapter 2
Review of Credit Union Research ....................... 11
Section 1: Theoretical View of Credit Union Issues ..... 11
Section 2: Empirical Evidence on Credit Union Issues .. 18

Chapter 3
Avenues for Research ........................................ 25

Summary
More And Better Research Is Needed .................... 31

Tables .............................................................. 33
Table 1 Growth Of The Credit Union Movement 1930-1990 . 35
Table 2 Benefit Specifications And Objective Functions . 37
Table 3 Summary Of Credit Union Regulation Studies .... 41
Table 4 Summary Of Credit Union Production Studies .... 43
Table 5 Summary Of Credit Union Elasticity Studies .... 45

Bibliography ...................................................... 47
Introduction

Credit unions hold a unique place among financial intermediaries. Founded on the ideal that consumer credit for the fledgling industrial working class represented a major step toward social improvement, the movement has grown to occupy a prominent position in consumer financial markets. Presently, credit unions manage $222 billion in assets for 61.5 million owner-members representing one-third of our nation's adult population.

The credit union movement is unique because of its structure and special encouragement by employers, individuals and government. Differing dramatically from for-profit financial intermediaries, these "pure" cooperatives represent both borrower and saver interests. Credit unions are further distinguished in having restricted "fields" of potential membership based on a "common bond" among members. Within these "fields of membership" credit unions make loans, and apply interest income to share dividends, expenses, and reserves. Democratically controlled, credit unions are ultimately governed by the membership on a one-person, one-vote basis.

Like most social experiments, credit unions have generated considerable controversy over time, due primarily to unique regulatory treatment. The recent debate over their tax exempt status is the latest such episode. Despite these factors, credit unions remain a relatively neglected research topic.

Better solutions to managerial problems occur given a valid theoretical basis for considering such decisions. In surveying the evolution of financial theory, C.W. Smith notes that, "purposeful decisions cannot be made without the explicit or implicit use of positive theories. Managers cannot decide what action to take and expect to meet their objective if they have no idea about how alternative actions affect the desired outcome."

To date, credit union theory fails to present a tight frame of reference from which to conduct empirical research. Consequently, much empirical work lacks focus. Moreover, much of the empirical work is dated or analytically limited.

This paper seeks to stimulate focused, relevant research on credit unions, thus enhancing credit union practice by fostering better theory. The scope and direction of the industry's continuing evolution warrants ongoing observation and analysis. In particular, rigorous treatment of the movement's past performance would provide a missing vantage point from which to assess the industry's future. Given its unique and evolving structure, growing prominence, and timely challenges, enhanced study of the credit union industry is clearly warranted.

To acquaint those readers unfamiliar with the credit union phenomenon, Chapter 1 reviews the structure, history, and performance of the industry. Chapter 2 presents a review of the academic theoretical and empirical literature on credit unions. Chapter 3 discusses alternative models of credit unions and develops suggestions for future research.

\footnote{Smith (1990), p. 4.}
Chapter 1

Credit Union Characteristics

Early pioneers of the credit union movement, such as Filene and Bergengren, were driven by a conviction that credit unions were an asset to an imperfect society. The contributions of volunteers and their sponsoring organizations reflect a sense of esprit de corps in the credit union movement. Currently, an elaborate system supports the original vision of retail banking facilities for the common person. Components of this rather formidable structure include the national and state associations or leagues, insurance companies, corporate centrals and central liquidity facilities, and national service corporations. Credit unions have evolved into a cooperative social structure as unique as their philosophical and cultural heritage. Collectively, they represent a formidable, increasingly mature market force.

Credit Union Structure

Credit unions are cooperative financial intermediaries chartered under the Federal Credit Union Act or the similar laws of 47 states, the District of Columbia, and Puerto Rico.2 Federally chartered credit unions are supervised by the National Credit Union Administration (NCUA), while state-chartered credit unions are generally overseen by state financial regulation offices. Although state charters vary, most have requirements similar to those of the Federal Credit Union Act.3 The following discussion concerns federally chartered credit unions unless specified otherwise.

As few as seven people can petition the NCUA for a credit union charter provided the group is joined by a “common bond of occupation or association, or by a well-defined neighborhood, community, or rural district.”4 Credit unions are more frequently defined by an occupational bond (79.7 percent) than associational (14.4 percent) or residential (5.9 percent) bonds.5 The advantages of a strict common bond include low cost of member credit information and an esprit de corps among credit union members and volunteers. Historically, the common bond requirement limited the growth of individual credit unions. Presently, a liberalized NCUA common bond interpretation permits rapid membership growth through mixed occupation and association memberships.6 Credit unions may also admit family members of individuals who meet the common bond criteria.7 The common bond is an important determinant of risk, growth, and cost structure of the credit union.

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2 Delaware, South Dakota, and Wyoming do not offer state credit union charters. Comparative Digest of Credit Union Acts (1989).
3 The various issues of Comparative Digest of Credit Union Acts discuss specific state chartering laws.
4 Federal Credit Union Act, Sec. 109. The number of required potential members is higher. The NCUA requires a minimum of 200-300 individuals, depending upon the type of common bond.
5 Credit Union Reports, (1990).
6 For an analysis of the history and evolution of the concepts of “common bond” and “field of membership,” see Burger and Dacin (1991).
7 A 1982 NCUA ruling allows credit unions to define “family members” as they desire.
The credit union is a not-for-profit firm which intermediates between creditor and debtor members. An individual qualifying under the common bond can complete an application for membership and after making a base share deposit is entitled to full membership privileges, including the right to vote in elections, apply for loans, and participate in credit union activities. Each member has one vote in any credit union election. The "one-member, one-vote" rule reflects the cooperative nature of the credit union.\(^8\) Credit union members annually elect volunteers for the board of directors. One member of the board, usually the treasurer, is legally entitled to a salary. The board is responsible for determining interest and dividend rates, making investment decisions, and selecting management. Those in salaried management positions execute the board's long-range plans and make short-range decisions.

The primary function of the credit union is to "promote thrift among its members and create a source of credit for provident and productive purposes." Credit unions specialize in making consumer loans, but they have recently offered mortgages and other long-term credit instruments.\(^9\) Loans are usually granted on the basis of capacity for repayment and are repayable in installments. The interest income of credit unions is applied to operating costs, dividends, rebates on loans and shares, and equity reserves. As not-for-profit firms, federally chartered credit unions are exempt from federal and state income taxation. The real property of federal credit unions is typically subject to taxation.

Shares earn a periodic dividend and are somewhat analogous to deposits in other financial institutions. In this study, the term "deposits" describes all member-generated sources of financing including shares. Projected dividend rates guide members comparing shares with alternative savings instruments. Credit unions rarely change the dividend rate without prior notice, though legally entitled to do so. Although not a common practice, some credit unions periodically distribute excess income by declaring either bonus dividends on shares or interest rebates on loans. Share accounts of up to $100,000 in federal and most state credit unions are fully protected by the National Credit Union Share Insurance Fund (NCUSIF).

In addition to membership intermediation, the credit union can participate in financial markets. If deposit volume exceeds loan volume, the credit union can invest excess funds in outside securities. While credit unions can borrow from outside sources to finance extra loans or expenses, their external liabilities may not exceed 50 percent of shares and reserves.\(^10\) The Central Liquidity Fund and corporate central credit unions are important sources of funds. The borrowing and saving patterns of credit union members within the economic cycle influences credit union participation in securities markets.

\(^8\) Report of the Committee . . . (1988) details the various philosophical credit union ideals.


\(^10\) As of 1989, 70 percent of all credit union members had access to first mortgage loans, 60 percent to lines of credit, and 72 percent to credit cards. Credit Union Services Profile, (1989).

\(^11\) Federal Credit Union Act.
Any interest and investment income left after expenses, dividends, and rebates is allocated to capital accounts. Reserves provide a buffer for loan loss and unexpected contingencies. Federal law specifies the amount of required credit union reserves. Regular reserve requirements vary by credit union age, but the law generally calls for six percent of risk assets to be held in reserves. Credit union treatment of reserves differs from that of most other institutions. For example, the owners of for-profit firms have clearly defined claims on reserves. Regular reserves of credit unions are inaccessible until dissolution, at which time they are distributed to shareholders on a per-share basis. The board can reduce special (non-required) reserves, but distributions are based solely on average loan and savings volumes for the quarter. Varying membership tenures, and presumably contributions to reserves, are unaccounted for by this distribution mechanism. Other cooperatives (i.e., farmer, art, utility, and purchasing) offer revolving claims on reserve growth. The unclaimable nature of credit union reserves has an important impact on credit union decisions and the expected benefits of credit union membership.

Non-legislated differences between credit unions and other intermediaries also exist. Many credit unions receive subsidized labor, office space, and supplies from their sponsor institutions. Credit union members often receive work-related benefits including payroll deductions and worksite branches. Subsidized insurance, financial workshops, and social events are provided by some credit unions. Credit unions also participate extensively in industry associations and state credit union leagues. The prominence of credit union leagues and the Credit Union National Association (CUNA) is noteworthy. The unique structures of credit unions and of the industry have resulted in both legislated and non-legislated advantages throughout the industry's history.

Credit Union History

Many credit union observers have concluded that credit union uniqueness goes beyond distinctiveness in organizational form. Common reference within the industry to the "credit union movement" implies the social movement aspect embedded in credit unions' historic roots.

The impetus for cooperative banking has been attributed to the breakdown of European feudalism. The formation of a new class of agrarians and craftsmen created new financial needs. Many poor workers turned to cooperatives in an attempt to improve their position. The Rochdale Society of Equitable Pioneers, an English cooperative founded in 1844, supplied consumer merchandise to low-income workers. The store rules, later to be known as the Rochdale Cooperative Principles, entitled members to purchase goods at or near cost with the purchase of a small equity share. Interest was paid on shares, and each shareholder received a single vote in store elections. Members also received operating surplus in proportion to the number of shares they owned. Many cooperatives still operate with rules similar to the original Rochdale principles.

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12 Federal Credit Union Act Sec. 116(a) includes a timetable which allows credit unions to gradually meet their required reserve level. The NCUA presently defines "risk assets" as all loans. A recent proposal to include all assets in the risk category is discussed in Report of the Credit Union Reserves Study Commission, (1980).

13 As many as 46 percent of all credit unions receive free office space, Credit Union Services Profile, (1989), p. B11. Wolken and Navaratil (1984) found that six percent of credit union operating expense is covered by sponsor subsidies.

14 Unless stated otherwise, this section draws heavily from the work of Moody and Fite (1984) and Melvin, Davis, and Fischer (1971), the two most widely cited sources for credit union history.
Cooperative financial institutions were developed in Germany. Hermann Schulze-Delitzsch, a German judge and politician, is largely responsible for the implementation of urban credit unions. Schulze-Delitzsch worked with merchants and craftsmen to build organizations which provided reasonably priced credit and interest on small deposits. Between 1850 and 1859, he organized some 200 credit unions. These credit unions followed many of the Rochdale principles and set other standards which are still in use. An initial interest-bearing share was required for membership, and each member had one vote in elections. A general committee responsible for overseeing the credit union was elected by the membership, and this committee chose an executive committee to perform daily transactions. By 1870, Schulze-Delitzsch had created credit union leagues and secured legislation granting the organizations legal status.

German cooperatives were influential models for the rest of the world. In 1900, the first permanent North American credit union was established in Levis, Quebec. The Caisse Populaire de Levis was quite similar in structure to the Schulze-Delitzsch organizations. In November 1908, Alphonse Desjardins, the founder of the Levis credit union, helped organize a caisse populaire in Manchester, New Hampshire for a Franco-American parish. This organization was the first credit union in the United States. Soon after, Desjardins met with Pierre Jay, the commissioner of Banks in Massachusetts, and Edward Filene, a Boston merchant and philanthropist, and the American credit union movement was born.

Although Jay is credited with drafting the first general credit union statute in the United States, the Massachusetts Credit Union Act of 1909, Filene was largely responsible for promoting the credit union in Massachusetts and the United States. Filene's interest in credit unions began in 1907, when on a trip to India, he saw how the cooperative bank provided reliable financial services to poor workers. Soon after returning home, Filene became active in the American credit union movement, devoting 30 years and $1.5 million of his personal resources to the movement.

Filene focused on establishing a fertile environment within which credit unions could grow and propagate. Filene did not participate in actual credit union organization, but instead concentrated his efforts on instituting credit union associations and gaining legislation to popularize the movement. His first major effort was establishing the Massachusetts Credit Union (MCU) in 1914. Although the organization originally offered membership to individuals, the purpose of MCU was to provide business forms and supplies, operating advice, and general support for existing Massachusetts credit unions. MCU accepted deposits from and offered loans to other credit unions, thus acting as a central clearinghouse. MCU also worked to increase the number of credit unions in the state. MCU is regarded as the first state association or league, an organizational form that subsequently proved vital to credit union growth.

While MCU and its successor firm, the Massachusetts Credit Union Association, nurtured the Massachusetts credit union movement, Filene turned his attention toward the rest of the country. In 1921 Filene established the Credit Union National Extension Bureau (CUNEB) and hired Roy Bergengren, a Massachusetts lawyer, to head the firm. The goal of CUNEB was to promote credit union development in the United States. Throughout its 14-year life, CUNEB remained essentially a two-person operation. Filene provided financing and policy guidance, while Bergengren executed the established plans.

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15 Interestingly, the U.S. Treasury determined in 1966 that St. Mary's was not a credit union. After a long legal battle, the U.S. District Court ruled that St. Mary's was a credit union. See Thompson (1990), p. 12 for a discussion of this case.
Bergengren's first task was to obtain credit union laws in the various states. The 38 laws in force by 1934 are testimony to his success. Perhaps the most important accomplishment of CUNEB was the 1934 passage of the Federal Credit Union Act. This broad law gave all American citizens the right to form a federally chartered credit union. The Credit Union Bureau of the Farm Credit Association performed credit union chartering and regulation duties. CUNEB also aimed to establish state credit union leagues similar to the Massachusetts league, but by 1934 there were only five state leagues. Nevertheless, Bergengren felt that national coordination of the movement was necessary. In 1934, the Credit Union National Association (CUNA) was created, a national league open to all state credit union leagues and any individual credit unions unable to access a state league. CUNA retained the leadership of Filene and Bergengren and established itself as the primary national credit union trade group, a distinction it still carries.

From its headquarters in Madison, Wisconsin, CUNA actively guided the credit union movement. The organization's stated purpose is to "promote the organization of credit unions under state and federal laws." In conjunction with the Farm Credit Administration and state leagues, CUNA helped increase the number of credit unions from 2,450 to 6,219 between 1935 and 1938. Services for member credit unions and legislative support for the movement were also elements of the CUNA program. CUNA Mutual and CUNA Supply Cooperative were formed as quasi-independent corporations in the mid-1930s with the purpose of providing low-cost insurance and office supplies to member credit unions. CUNA Mutual originally offered only borrower protection for affiliated credit union members, but their product line soon expanded into saver insurance and life insurance. CUNA Supply provided bookkeeping and promotional forms at a savings over alternative suppliers. The services of both organizations became popular. CUNA's services also included credit union bonding, data accumulation and reporting, management education, and publication of trade journals. Dues and receipts covered the cost of these services, with any surplus refunded to members.

The Financial Institutions Regulatory Act of 1978 established the Central Liquidity Facility (CLF). Both federal and state credit unions are eligible for membership in the CLF, along with central organizations such as state centrals and U.S. Central Credit Union. An equity subscription of one-half of one percent of assets entitles a credit union to CLF membership. With the CLF, credit unions became part of a wide, complex financial community. In 1971, Congress instituted the National Credit Union Share Insurance Fund (NCUSIF), to be administered by the NCUA. All federally chartered and many state-chartered credit unions eventually joined the insurance program.

In the past two decades, credit unions have sought to maintain their competitive advantages in a climate of deregulation. Although credit unions lost the legislated advantage of being able to pay a higher rate on the equivalent of passbook savings, they gained the freedom to provide a full array of loans and deposits.

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16 Credit Union National Association, "Constitution and Bylaws," (1934).
17 CUNA Mutual and CUNA Supply were chartered under Wisconsin cooperative law as independent corporations, but the boards of these two organizations were comprised of CUNA management and directors.
Credit Union Performance

The structural evolution of the credit union movement has been accompanied by an equally impressive increase in the size of the movement. As illustrated in Table 1 (see page 31), credit unions have grown dramatically since the 1930s both absolutely and vis-a-vis competitor institutions. The credit union share of the massive household savings sector ($2.2 trillion) advanced steadily over the past six decades to 6.3 percent in 1990. Credit unions and banks prospered during the past decade at the expense of the savings institutions, which lost approximately 15 percent of the savings market.

Credit unions also captured a significant share of the consumer installment credit market. From inception, their market share grew steadily peaking in the mid-1970s. Since deregulation in 1980, their share of this key consumer market has dropped to 12.1 percent. Credit union market share for auto loans dropped from a high of 22.8 percent in 1975 to 16.6 percent in 1990. In contrast, banks maintained their share of consumer installment credit over the past decade despite losing approximately 9 percent of the auto market. Exercising their deregulated lending powers, savings institutions gained market share in both the consumer installment and auto credit markets. The shifting market shares were reflected in credit union balance sheets. The industry loan-to-deposit ratio fell to a low of 63.1 percent in 1986 but rebounded by the end of the decade to 70.4 percent, well below that of earlier decades.

Deregulation of financial services in 1981 provided an impetus for the movement to expand its offerings to a wider market. Credit unions have begun to overcome the "common bond" limitation. Even as the number of credit unions fell from 23,689 in 1970 to 14,549 in 1990, the ratio of credit union membership to the nation's population grew steadily from approximately 11 percent in 1970 to 25 percent in 1990. By 1986, 50 percent of all credit unions and 75 percent of credit unions with over $50 million in assets served multiple employer groups. Although dramatic differences remain in terms of services offered by size of credit unions, half of the nation's credit union members now receive seven of eight key financial services.19

Despite these trends toward serving a larger audience, the vast majority of credit unions remain extremely small by current standards, with 43 percent under $2 million and about 94 percent under $50 million in assets.20 Only about 6 percent of the nation's credit unions are over $50 million in assets, a level still small in comparison to commercial banks.

19 Credit Union Services Profile, (1989).
Conclusion

In summary, the eight-decade history of our nation’s credit union movement chronicles the evolution of this cooperative experiment from infancy to early maturity. The vision of its founders has given rise to an elaborate cooperative system supporting the individual credit union which includes the Credit Union National Association, state leagues or associations, and a central liquidity system. The vitality of these “pure cooperatives” was reflected in growing collective market shares throughout most of this period.

Deregulation of the financial services markets saw the first break in this trend. Although credit unions continued to gain market share in consumer savings during the last decade, their share of the consumer installment credit market has slipped somewhat. Importantly, this slippage occurred despite enrolling an increased portion of the population as credit union members during the same period. A series of strategic attacks by commercial banks on these unique and increasingly prominent competitors within the turbulence of deregulated markets provided a rich fabric for researchers. However, the research output, like many restaurant meals, failed to live up to its table setting. The courses themselves were numerous, indeed voluminous, but lacking in texture and theoretical focus. Let us now turn to a review of these studies.
Chapter 2

Review of Credit Union Research

This chapter focuses on academic studies of the credit union—primarily studies by economists—the wide practitioner literature is beyond the scope of this paper. In general, this empirical and theoretical research has progressed in the past twenty years. The strengths of the existing literature include thoughtful analysis of credit union objectives and cost structure. Theoretical attention has been largely devoted to the borrower/saver conflict, resulting in a number of relevant models. Credit union theory is still deficient, however, with much of the supporting empirical research either outdated or analytically limited. A failure to properly capture temporal effects in the theory and dated empirical results are among the primary weaknesses of the literature. Additionally, historical aspects of credit union evolution have not been rigorously treated. More accessible credit union databases would help facilitate future research. In the past, the industry’s small size and limited funding discouraged research. The growth of credit unions over the past two decades and the recent establishment of the Filene Research Institute should help alleviate these problems.

Section 1: Theoretical Views of Credit Union Issues

Effective analysis of credit union performance is facilitated by reliable theoretical models. The rationale for these models is their ability to reduce a complex organization into a manageable framework for analysis. The model building process, although filled with simplifying assumptions, often yields valuable insights into credit union operation. Models of credit union objectives, production, taxation, and regulation are the focus of this section.

Credit Union Objectives

Models that examine the objectives of a credit union must first determine whose interests are represented by the credit union operation. The credit union is a pure cooperative—both the suppliers (people who deposit their funds in the credit union) and the users (the people who borrow) own the firm. Since it is not clear which group deserves pricing and allocation priority, defining claims on the credit union’s resources is a commonly mentioned research challenge. Most authors model three distinct groups of credit union members: (1) current borrowers, (2) current savers, and (3) future borrowers and savers. Potential overlap between groups—current borrowers may be future savers—further complicates this issue. Determining allocations among these groups is the fundamental task faced by credit union management.


Benefit specification models. These models suggest quantifiable criteria that describe the benefits received by credit union members. Since there is no obvious credit union analog to profit maximization, researchers have had to develop performance criteria which account for the borrower-saver-equity conflict. Benefit denotes the gains each group receives from the credit union. The absence of a universal expression for member benefits is reflected in the diversity of benefit specifications summarized in Table 2 (see pages 32 and 33). Most authors use an index of internal and sometimes external rates to determine the amount of preference received by each group. Smith, Cargill, and Meyer (1981) specify borrower (saver) benefit as the difference between credit union and market rates on loans (shares) times the volume of those loans (shares).

Walker and Chandler (1977) define benefits as the difference between market and credit union rates alone. These specifications appeal to the economic principle of opportunity cost in defining the benefits of credit union participation. Taylor (1979a) takes the difference between the internal loan and share rate as a measure of member benefit. It is now conventional to refer to a credit union as borrower-oriented if borrowing members receive a majority of the benefits, and vice versa if members who are savers receive the majority of the benefits.

The Smith, Cargill, and Meyer specification seems most consistent with the credit union principles of providing low-cost loans and high-yield deposits to the membership. The index of internal and external rates captures the credit union's impact in the marketplace, while loan and deposit volume reveals how effectively the credit union reaches its membership. Although the Walker and Chandler index fails to account for volume, these authors defend this convention by asserting that "if volume is considered, benefits received by savers and borrowers on each dollar of savings/borrowing is unequal. Equal treatment of borrowers and savers is consistent with . . . the purposes of . . . the credit union." It would seem that the benefits of superior rates cannot be enjoyed unless loan and savings facilities are utilized. For example, Taylor (1979a) fails to recognize the economic benefits of using the credit union rather than other intermediaries. Still, the specifications have not adequately captured the need for credit unions to allocate resources for future members. The failure to resolve inter-generational equity issues leaves this area in need of additional work.

Objective Functions. The introduction of performance criteria is the first step toward a full credit union objective function. The "cooperative principles" of the credit union include providing low-cost credit and high-yielding deposits, building financial stability, and serving an open membership with financial services. Given such diversity, it is difficult to identify a single credit union goal. Therefore, specification of the "credit union objective function" is controversial. Most authors assume that credit unions should maximize preference to borrowers and savers.

23 Opportunity cost accounts for the benefits of alternative actions.
24 Flannery (1974) first coined this terminology.
27 Smith (1984) devotes an entire paper to the discussion of objective functions.
A group of authors, led by D.J. Smith (1981, 1984, 1988; Smith, Cargill, and Meyer 1981), reason that credit unions should maximize total distribution to borrowers and savers while maintaining neutrality between the two groups. In other words, under optimal conditions, benefits to borrowers and savers are equal. The credit union is assumed to maximize the total utility of all members, with the constraint that total utility of borrowers and savers is equal. The exact specifications of borrower and saver benefits vary among authors, but they are a function of internal and external rates of return and volume. Smith, Cargill, and Meyer (1981) use this specification and the additional requirement that reserves be kept at the required level. Smith (1984) basically duplicates these results but adds that utility should be maximized even if the borrower-saver neutrality constraint is violated. In economic parlance, these optimization structures call for efficient allocation of resources while maintaining equality between borrowers and savers. This specification seems quite relevant to present credit unions.28

Another group of models, exemplified by Taylor (1971a, 1977, 1979a), focuses on cost-minimization. Cost-minimization models differ in a number of ways from their benefit-maximizing counterparts. These studies assert the credit union should minimize internal spread between the credit union’s loan and share rate.29 Taylor (1977) concludes cost-minimizing credit unions are socially efficient producers in the long run, but Wolken and Navratil (1979) challenge the generality of this result. First of all, these models implicitly assume a given (exogenous) credit union size, making the problem of service rationing relevant. Benefit-maximizers assume that the credit union has control over its own size. Secondly, cost-minimizing models do not effectively address borrower/saver neutrality. The limitations of cost-minimization and the motivation behind its development make it a less favorable objective than benefit maximization.

**Other Objective Models.** Other objective functions have been proposed. Chateau (1980) asserts credit union managers should maximize the utility of reserves, a close approximation to maximizing asset size subject to capital restraints. Hempel and Yawitz (1977) assert the credit union should maximize profits. P.F. Smith (1971) calls for size maximization. Kohers and Mullis (1987a) conclude “it is not at all clear” what the goal of the credit union should be. Constrained benefit maximization is compatible with the general trend in economics away from ad hoc specifications and towards concrete criteria.

**Optimization Models.** The growing literature on credit union objectives is generating theoretical insight on credit union operation. Notable weaknesses exist, though. As Jenster and Overstreet (1990) found, credit union managers have not explicitly utilized results from this literature. Consequently, optimization models should be distilled into a practical form. Additionally, optimization research has thus far been confined to a single-period framework. Smith (1984), along with some other researchers in the field, believe optimization is, “. . . in essence a single-period problem.” This treatment may prevent researchers from getting to the heart of the

28 Overstreet and Rubin (1991) propose a modification of the Smith, Cargill, and Meyer specification. Instead of maximizing benefits each period, a weighted sum of benefits over time is maximized, subject to equality over time. This modification facilitates intertemporal modeling of the credit union.

29 This research may be misleading because cost-minimization is often used as a basis for empirical tests of economies of scale. Thus, cost-minimization may be more convenient than realistic.
allocation problem for an ongoing concern. Another problem is no attempt has been made to integrate undivided earnings with other allocation decisions. Quoting Smith again, "It can be assumed ... that this surplus retention parameter is set optimally through some more general intertemporal maximization process" (1984, p. 1161). It is time to bring surplus retention into the maximization equations. Refinement of these studies using intertemporal techniques developed in the economic literature could be a valuable next step toward defining credit union purpose.

**Production Models**

Production models are often used to analyze credit union productivity. These models relate loan and deposit volume, cost structures, and equity retention to various parameters pertinent to credit union operation. Production models also explain credit union intermediation and benefit production. Much has been written about the effect of pricing on member benefits, but expanded explanation of how pricing affects production is warranted.  

A number of descriptive studies illustrate the actual operations of a credit union – the mechanisms used in pricing, advertising, and labor decisions. Black and Dugger (1981) provide such an account of credit union function and Heaton and Dunham (1985) describe credit union operations within statutory guidelines. These descriptive pieces are informative, but fail to offer the reader a fresh theoretical perspective of the credit union.

**Allocation of Benefits.** Treatment of the issue of allocation to reserves or undivided earnings in the credit union literature parallels similar discussion in the cooperative literature. Additions to reserves are valued as a transfer of benefits from present to future owners. Croteau (1956), Taylor (1977, 1979a), Walker and Chandler (1977, 1978), and Smith (1984) show that each additional dollar of credit union equity requires an increase in the loan rate, drop in the share rate, or cut in expense. The benefits of equity additions are the future distributions that can be drawn down from reserves. Some form of this simple sources-and-uses model has been utilized in every production model to date.

Modeling a closed borrower, saver, and equity system is useful for examining a static credit union. Such a model is inadequate for multi-period analysis because it assumes demand for loans and deposits is exogenous. It is possible, however, that an increase in reserves may change loan and deposit demand because of the associated change in perceived risk. Will increased borrower benefits in one period raise credit union income – and benefits to all – in the future? How do

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30 Taylor (1979a) makes some telling points about optimal credit union size and reserves allocation, but bases his argument on size restrictions, not long-term benefit maximization. He also runs into the problem of intertemporal reserves distribution encountered by all credit union writers.

31 We do not review optimal risk portfolio. Presumably, the concepts from for-profit risk analysis, e.g. Chambers and Charnes (1961), are also relevant to the credit union, since both institutions have roughly the same access to financial markets.

32 Black and Schwetzer (1985), Broekschmidt (1977), and Walker, Chandler, and White (1976) treat topics such as loan rebates, reserve use, and deposit instruments.

33 See Tiemann and McGuire (1983), Reed and Engelen (1984), and Vannarickle and Ladd (1983) for discussions of intertemporal wealth distribution in cooperatives.
present allocations affect the future loan and deposit rates? Can the credit union accommodate changing demographics within the credit union? Smith (1988) recently addressed the lack of intertemporality in credit union models, but his model only considers minimum required reserves.

Credit union liquidation theory deals with resource allocation at the time of credit union dissolution or membership flux. Only two authors have rigorously addressed this issue. Wood (1967) identifies the problem of member flux and the distribution of undivided earnings. Since members have no direct control over reserves, those who leave the credit union do not receive forgone benefits. Wood proposes a system of entry and exit premiums whereby each member of the credit union pays a fee when buying shares and receives a refund when selling those shares. The size of the premium depends on the reserve/share ratio at the time of the transaction. Taylor (1979a) proposes allocating undivided earnings through the traditional method of revolving funds used by many cooperatives. This method provides a vehicle for borrower participation in equity, a characteristic absent in the Wood plan. The Wood and Taylor plans, though creative, will remain speculative until credit union bylaws are changed.

Credit union production models have improved in the past decade as the mechanics of credit union decisions in these models have been standardized. The credit union is assumed to make an allocational decision based on its preference to borrowers, savers, or equity. The single-period implications of making these allocations have also been examined in detail. With the exception of the authors [Overstreet and Rubin (1991)], only Peterson (1981) and an anonymous referee to Smith (1984) have suggested allocation in one period affects net income in the next. What the literature now lacks is a thorough discussion of the intertemporal effect of distribution decisions. Walker and Chandler (1978) claim "the allocation of net revenue is the second phase of the financial management of a credit union; it is undertaken only after net revenue has been determined." Intertemporal optimization techniques should prove fruitful for researchers combining distribution and revenue in a multi-period framework.

Models of Taxation

Credit unions presently enjoy a tax exemption on retained earnings. The rationale for this exemption has been that credit union "profits" are generated from interactions among association members. Recently, Congress has taken a close look at the exemption. Researchers have examined the government's ability to raise revenues with a tax. The most thorough studies indicate that credit unions can avoid an income tax by manipulating rates and minimizing retained earnings.

34 Caves and Peterson (1986) outline the revolving funds method in the cooperative.
36 Recent issues of Capitol Viewpoint discuss challenges to credit union tax exemption.
Cook and D'Antonio (1981) use a basic optimization model to determine the impact of an income tax. The equations

\[ W_a = (1 - T_p) \times r_d + (1 - T_d) \times m \]
\[ W_b = (1 - T_d) \times m - (1 - T_p) \times r_l \]

describe saver and borrower wealth, respectively, where

- \( W_a \) = saver wealth
- \( W_b \) = borrower wealth
- \( T_p \) = tax rate on personal earnings
- \( T_c \) = tax rate on credit union retained earnings
- \( r_d \) = average dividend rate
- \( r_l \) = average loan rate
- \( m \) = average credit union margin (\( r_l - \text{operating cost} - r_d \)).

Saver wealth is the after-tax dividend rate plus a portion of after-tax credit union equity. Borrower wealth is a portion of after-tax credit union equity less after-tax loan payments. First-order statics indicate deposits and loans increase with an income tax because the credit union will raise the share rate and lower the loan rate. Accounting profits are reduced and members receive more favorable rates. A consequence of this pricing practice is deterioration of the equity position. Taylor (1971b), Smith, Cargill, and Meyer (1981), and Smith (1988) come to similar conclusions.\(^{37}\)

Although an income tax on credit union accounting profits is theoretically deficient, some researchers favor the tax. Flannery (1974) appeals to the "horizontal equity" argument in recommending taxation. He reasons the growing similarity of credit unions and mutual savings banks demands equal taxation, a conclusion similar to that of Wood (1967).\(^{38}\) Brockschmidt (1977) believes taxation will induce more equitable market conditions, but she assumes "taxation would have caused no change in (credit union) behavior." This is an untenable position in light of models such as those devised by Cook and D'Antonio and Smith. The introduction of a credit union tax system would have a profound effect on their condition. Further research will help project the consequences of taxation.

\(^{37}\) Researchers have not attempted to identify alternative tax structures which may be more appropriate than income taxes for credit unions.

\(^{38}\) For an alternative viewpoint in the taxation argument, see Melvin (1981), which presents a favorable review of tax exemption.
Regulation

The extent of intermediary regulation has varied dramatically in recent years and expanded research on its effects is essential since new regulation is under consideration. Refinement in this field will enable regulators to predict more accurately the effects of their decisions. Present studies of credit union regulation are summarized in Table 3 (see page 34).

Wolken and Navratil (1979) construct a model of the firm with regulation and find "economic efficiency will be achieved only if the regulatory process is flexible enough to distinguish among different types of credit unions." The implications of taxation and regulation are found to depend upon the competitive nature of the loan and share markets, as well as long-run cost structure. Flannery (1974) provides a descriptive application of general economic regulation-efficiency theory to the credit union industry. He recommends deregulation of the credit union industry, supports growth in scope, and accurately depicts the social costs of providing the credit union tax exemption. Smith (1988) shows that member benefits are cut as the cost of failing to meet required reserve levels increases. Smith specifies random variable distributions, the precise level of risk the credit union is willing to assume, and a simplified two-tier cost function. The ensuing chance-constraint optimization is a simple device for introducing stochastic conditions. Rather than requiring a specific reserve level, a certain probability of obtaining that reserve level is required. His use of risk is innovative and could serve as a template for future stochastic modeling.

These studies effectively explain the effects of certain forms of regulation. One form of regulation not rigorously considered by the current literature is control of the common bond. Liberalization of common bond requirements has been the source of considerable controversy within the financial services industry, but little research has been done to determine potential effects. If the liberalization trend continues, how will credit unions be affected? Credit union needs for diversification and growth must be considered within this context.

41 Taylor (1971) describes some problems with common bond requirements and Burger and Dactn (1991) thoroughly review common bond history.
42 See e.g., Hall (1989).
Section 2: Empirical Evidence on Credit Union Issues

This section examines empirical credit union research, which has concentrated on six topics: credit union objective functions, production, subsidies, elasticity, regulation, and growth. Where applicable, empirical tests are critically reviewed. In addition, appropriate methods are suggested for credit union topics which have not been studied empirically.

Credit Union Model Objectives

Limited empirical work has been done to determine whether credit unions are borrower-dominated, neutral, or saver-dominated. Flannery (1974) found a 40-35-25 percent distribution of credit unions into saver, neutral, and borrower categories. He distinguishes credit unions on the basis of rather crude proxies (membership participation, borrower to saver ratio, and the somewhat better internal spread) and, therefore, his results must be carefully interpreted. Smith (1981) sorts credit unions by loan and deposit rates finding the following distribution: 20 percent borrower-dominated, 50 percent neutral, and 30 percent saver-dominated. Credit unions with both low loan and deposit interest rates are considered borrower-oriented, while credit unions with high loan and deposit interest rates are saver-oriented. Smith concludes that credit unions are generally neutral. In a study of stable and unstable credit unions, Kohers and Mullis (1987a) and Kohers (1986) find that benefit allocation depends on the business risk of the credit union. Credit unions within a volatile operating environment are found to allocate more resources to equity than stable institutions.

Production

The economies of scale issue is important to managers and public policymakers because optimal credit union size depends upon cost structure. Economies of scale estimates provide information on the credit union production function. Positive economies of scale (increasing returns to scale) indicate a decrease in per-unit cost as production expands. Kohers and Mullis (1988) argue that scale economy research is especially important to credit unions because of their unique membership structure and history of rapid growth. Results vary, but research generally indicates increasing returns to scale as summarized in Table 4 (see page 35).

Estimation of a Cobb-Douglas production function is a commonly used technique in scale economies research. Total cost is presumed to be a log-linear function of output measures (assets, liabilities, loans, etc.) adjusted for factor prices and organizational idiosyncrasies. Wolken and Navratil (1980) adopt the Benston-Bell-Murphy approach which assumes that credit unions minimize the cost of some fixed output level. They estimate the following regression equation, which is typical of most empirical cost structure work:

43 Navratil (1981) found that credit unions generally maintain a constant internal spread. This supports the Smith preference test because rate changes occur as either an upward or downward shift in both the deposit and loan rates.

\[ \ln(E) = a + b \ln(Q) + c \ln(S) + d \ln(L) + e \ln(R) + f \ln(C) + g \ln(W) + \epsilon \]

where
- \( E \) = operating expenses, including the economic value of subsidies,
- \( Q \) = output (either loans granted, loans outstanding, or the number of share accounts),
- \( S \) = average size of share accounts,
- \( L \) = average size of loans,
- \( R \) = loan-to-asset ratio,
- \( C \) = ratio of number of loans not delinquent more than two months to the number of outstanding loans,
- \( W \) = average hourly wage paid to employees,
- \( \epsilon \) = error term.

Wolken and Navratil refine the earlier work of Flannery (1974) and Koot (1978) by explicitly accounting for subsidies and differences in payroll. Their investigation of 1972-1975 CUNA and NCUA data on 372 credit unions generally reveals significant economies of scale, but this result depends on the output measure used. Economies of scale were not found when "loans granted" was used as the output proxy.

This sensitivity to output measure calls the robustness of Cobb-Douglas specification into question. The Cobb-Douglas form utilized is restrictive with its functional form unable to accommodate U-shaped cost curves. The cost-minimization objective function posted also seems unrealistic given more recent theoretical work. When these studies were completed, regulation may have limited credit union output. Moreover, since deregulation, it would be erroneous to assume credit union output is externally determined.

Murray and White (1983) point out the failings of Cobb-Douglas estimation and propose a system of translog cost equations. They assume cost is a function of many output measures. The output measures they use are mortgage lending, non-mortgage loans, and investment exceeding minimum liquidity requirements. Murray and White conclude from their examination of data on 61 credit unions operating in British Columbia, that statistically significant returns to scale exist over all credit union sizes. One implication of these results is that (over their sample range of up to $15 million in assets) there is no minimum efficiency size. In addition to insight on scale economies, the translog specification revealed significant levels of cross-elasticity and economies of scope for some accounts. Youn (1986) expands the breadth of the Murray and White study and finds British Columbian credit unions have economies of scale in some products (mortgage loans) but diseconomies in others (non-mortgage loans).

\[ \text{Their criticism is especially telling because they earlier adhered to the Benston-Bell-Murphy technique of credit union cost study. See Murray and White (1980).} \]
Taylor (1979b) empirically estimates the credit union demand for labor by examining data on 258 credit unions. He asserts that labor quantity is a function of wage, credit union size, and technology. Results show that a 10 percent increase in credit union output (as proxied by a host of factors) is accompanied by a 9.07 percent increase in labor, implying slight economies of scale.

In what might be considered a methodological retrogression, Kohers and Mullis (1988) replicate the Croteau (1956) study and bypass production function estimation entirely in their search for scale economies. They update the work of Cox and Whigham (1984) by comparing expense/asset and expense/income ratios of large and small credit unions. They conclude that credit unions experience significant economies of scale.

Support from Sponsors and Leagues

Many credit unions benefit from sponsor support including free office space, labor, and supplies, and from payroll deduction and internal mail services. Research studies support the prevailing industry notion that such support decreases as the credit union grows.

Wolken and Navratil (1984) conclude sponsor support accounts for six percent of total credit union operating expense. They find credit unions take full advantage of capital subsidies but do not efficiently utilize labor subsidies. The authors hypothesize labor subsidies are squandered because of implicit salaries (perquisites for volunteers) or inferior volunteer work output. Wolken and Navratil also find sponsor subsidies are inversely related to credit union size. Subsidies cover 21 percent of expenses in credit unions with less than $1 million in assets. Flannery (1974) similarly finds that smaller credit unions receive greater sponsor support, thus offsetting possible scale economy disadvantages. A number of other authors approach the issue of sponsor subsidization indirectly, assuming credit unions receive positive but decreasing support as they grow.46

Leagues and other credit union associations provide member credit unions with operating advice, credit card and other operating services, lobbying support, education, research and development programs, conferences, and general credit union publicity. The implications of league and association activity have not been adequately explored.

Pearce (1984) and Moody and Fite (1981) describe the growth of credit union league activity but make no attempt to quantify the benefits of associations. Associational cross-subsidies exist, but the extent of those cross-subsidies over time and scale remains an open empirical question. Are the costs of credit union associations and leagues borne primarily by larger member institutions, thus increasing the subsidy of small credit unions? Modifying the subsidy specification to include leagues and other associations will improve knowledge of the credit union cost function.

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46 Koot (1979), Fry, Harper, and Stasell (1982), and other studies of economies of scale usually account for subsidies.
Share and Loan Elasticity

These studies investigate credit union market conditions by relating the price (yield) and quantity demanded of a good. The quantity demanded of a financial instrument is elastic if a small percentage change in price induces a large percentage change in volume. Low price elasticity, or inelasticity, denotes insensitivity of quantity to price. In the case of deposits and loans, the relevant interest rate is the “price.” Price elasticity is referred to in this case as “interest elasticity.” Although empirical work on loan and deposit interest elasticity is relatively sparse, it appears that the elasticity of credit union instruments is rising, implying that credit unions are part of a more competitive, diverse market. 47 Table 5 (see page 36) outlines the basic methodology and conclusions of previous studies.

Opinion on share and loan interest elasticity seems to have been guided as much by qualitative observation as by empirical estimation. Croteau (1956) concludes from a survey of credit union members that factors such as convenience, safety, and courtesy are more important than yield in determining share and loan volume. Numerous trade journals stress the importance of non-price factors on share and loan volume. 48 The prevailing wisdom until the early 1970s held that loan demand was relatively insensitive to the interest rate. For example, Flannery (1974) notes that demand for credit union loans is “notoriously inelastic.” 49

Flannery examines a sample of 952 credit unions from 1972 NCUA data. To determine the interest elasticity of shares, he estimates the regression equation

\[ S = a + bR + cL + dI + eP + Fa + gY + Ho + iB + \varepsilon \]

where

- \( S \) = average size of share accounts,
- \( R \) = dividend rate,
- \( L \) = average size of loans,
- \( I \) = interest rate on loans,
- \( P \) = payroll deduction (yes/no),
- \( A \) = total assets,
- \( Y \) = age of the credit union,
- \( O \) = occupational bond of association (yes/no),
- \( B \) = residential bond of association (yes/no),
- \( \varepsilon \) = error term.

47 Rhodes (1987) is representative of a class of studies which determine the boundaries of the credit union “market.” He finds that non-bank financial intermediaries have mixed effects on banks, implying that credit unions and banks are not in a completely unified market. Goopu and Lomba (1987) conclude that credit union data differs significantly from that of other intermediaries. Data analyses like these, plus member surveys (to gauge perceived credit union competition), should help determine the extent of credit union exposure to bank competition.

48 For examples, see Shafcroth (1987) and Weidman (1989). Furthermore, from 1980 to 1989 Overstreet and Davis conducted over 20 separate determinant attribute analyses of Alabama credit union memberships empirically confirming the relative importance of convenience and service factors in membership utilization patterns.

Examining an analogous equation to determine loan elasticity, he uses loan rate, association bond type, credit union age, asset size, average share size, and percentage of share accounts under $500 as the independent variables. He finds low interest elasticities of 0.35 and -0.11 for shares and loans, respectively.\(^50\) Thus, the Flannery study gave statistical substance to the prevailing notions about elasticity.

Navratil (1981), in an analysis quite similar to Flannery's, finds deposit and share elasticities are rising. Navratil's data set (up to 1978) is slightly more recent than Flannery's (1972) but is still rather dated. Much has been said about the growing competitiveness in financial intermediation, but little empirical evidence has been presented. Updated empirical studies of elasticity should help gauge the effects of environmental change.

Regulation

Credit union response to regulation is a special area of concern for managers and boards of directors. Research in this area includes comparisons of operating characteristics before and after regulatory change. Profit margin, reserve level, services, and product rates may all be impacted by regulation. Bundt and Keating (1988) provide such an analysis for large credit unions. Comparing 1979 to 1985 operating characteristics of the top 100 credit unions, they found the average cost and operating margin of these credit unions did not significantly change. They conclude large credit unions adapted well to the more competitive environment. Importantly, they acknowledge their results do not pertain to smaller credit unions. In light of the decrease in their numbers, a study of smaller credit unions is essential.

Wolken and Navratil (1985) examine the differences in state and federal charters. A study of 462 recently formed credit unions found organizers opt for state charters when state laws allow more unrestricted operations. Statutes which weigh heavily in the charter decision include limits on investment outlets and branching. Rate ceilings are not important factors in the chartering decision.

Concentrated industries are natural targets for monopoly regulation. The classic argument holds that a few large institutions have the power to raise prices above efficient levels. In the past two decades, a counter-argument has been presented which claims large firms do not collude, but instead have efficiency advantages enabling them to grow large.\(^51\) The two hypotheses have radically different policy implications—the concentration/profitability argument advocates market intervention, while the efficiency/profitability hypothesis discourages it. The massive empirical literature surrounding this debate in banking was reviewed by Gilbert (1984). He concludes studies of concentration must consider the effect of individual firm size. He also feels existing empirical studies are analytically stagnant. A study which includes a sample of credit unions is warranted because the merit of regulatory interference hangs in the balance.\(^52\)

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\(^{50}\) Elasticity figures generally represent percent change in quantity divided by percent change in price.

\(^{51}\) See, e.g., Demsetz (1973).

\(^{52}\) Prescott, Kohli, and Venkatraman (1986) show that the collusion-efficiency argument often varies by specific market. If true, the locale of credit unions in the efficiency-oligopoly spectrum will have to be established for each market, timeframe, and competitive situation.
Credit Union Growth

The rapid growth of credit unions versus other depository institutions has attracted considerable attention from economists over the last three decades. For the most part, this work has been qualitative in nature. The performance of credit unions in the deregulated environment of the 1980s has been the focus of papers by Pearce (1984) and Heaton and Dunham (1989). These studies are confined to the early part of this decade and, like their earlier counterparts, are qualitative in technique and conclusions. In what might be considered a more rigorous analysis of recent credit union performance, Bundt and Keating (1988) found the 100 largest credit unions experienced neither increasing costs nor declining revenues during deregulation (1979 to 1985). The study is limited because it excludes the vast majority of credit unions and fails to control for the effects of interest rate behavior on the cost of funds.

Like the seminal history by Moody and Fite (1984), economists have tended to discuss the credit union industry's historical performance descriptively. A more rigorous analysis of credit union evolution should provide a more realistic vantage point from which to view the future of these unique institutions. In addition, comparative studies across national boundaries are needed to provide insights beyond those possible from a single economy. In this same vein, study of comparative performance levels for credit unions across states and regions might provide useful perspectives for viewing the future.

Conclusion

In conclusion, the credit union phenomenon has generated considerable academic interest within the last two decades. However, theoretical research into how these unique institutions should optimally operate, including the delineation of equitable objectives for disparate member groupings, lagged well behind the evolutionary pace of the industry's structural and market development. Topics of equally broad concern such as the casual factors underlying the movement's exuberant growth failed to attract rigorous attention.

Other issues equally germane to viewing the operation and, hence, future of these firms have been studied more intensely. Unfortunately, results tend to be both vague and dated. For instance, it is now widely conceded that economies of scale are present in credit union operations. Yet, from a regulation and practitioner standpoint, it is not clear what size and type of credit union is the most efficient, or what role the industry's cooperative structure has in offsetting scale inefficiencies, particularly for the large number of small (under $5 million in assets) credit unions. Are large credit unions and, hence, their memberships subsidizing the vast number of small credit unions through their support of the cooperative structure? Are stockholders of sponsoring firms


54 Other studies could be considered in this genre but are limited in scope and purpose. An analysis of black-controlled credit unions by Black and Schweitzer (1985) provides comparative performance data for this interesting industry subset. Kohers (1986) and Kohers and Mullis (1987) present comparative operating statistics for occupational credit unions segregated on the basis of parent company or sponsor cyclicity.
continuing to subsidize credit unions well beyond adolescence? Are taxpayers further subsidizing credit unions and maintaining otherwise inefficient operations without offsetting societal benefits?

Past studies concerning economies of scale in credit unions simply failed to capture the full reality of the movement's cooperative structure. Regulatory-oriented studies of market efficiency were never formulated to include the nation's "pure cooperatives." Clearly, a great deal of the industry's empirical foundation needs either updating or reformulation. Greater availability of databases and the creation of the Filene Research Institute's Center for Credit Union Research should ensure more rigorous attention to these and other industry issues in the future.

A more subjective deficiency in the empirical work to date is its lack of continuity and focus. Credit unions have outpaced their theoretical frame of reference. Within the last decade, major strides have been made in terms of identifying objectives, but these models have been formulated within a single period timeframe. Credit union theory needs to be refined within an intertemporal frame of reference considering the implications of resource allocations not only to current member groupings but future ones as well. In addition, more recent theoretical advances, particularly agency theory, need to be applied to credit union operations. In the following section, we explore the potential of this research tract.
Chapter 3

Avenues for Research

A basic tenet of this monograph is effective credit union practice requires a reliable theoretical model. Studies of production, regulation, and objectives have generally incorporated an ad hoc neoclassical framework. This framework, designed to analyze the operation of for-profit firms, limits the accuracy of both empirical and theoretical research on credit unions and ultimately limits progress toward better practice. This chapter draws from recent advances in the theory of the firm to suggest a foundation for future credit union study. The major facets of neoclassical and agency theory are surveyed and possible applications of agency theory to the credit union are proposed. It appears a number of relevant agency problems exist in the credit union.

Neoclassical Models of the Firm

In the neoclassical profit-maximizing model, the "firm" is assumed to have a single goal—profit maximization. The neoclassical model assumes complete entrepreneur control of the firm and its resources. Highly refined examples of these models appear in modern price theory textbooks such as Friedman (1986) and Varian (1984).

Production and objective functions characterize the neoclassical model firm. The production function specifies the amount of output created by certain amounts of labor and capital. A corresponding cost function can be added after specifying an input factor market. The objective of the firm is usually profit. General modifications to the production function, such as taxation, are easily assimilated. A product market completes the model. Maximization of the objective function with respect to various operating constraints and market conditions yields conditions for optimal operating structure.

Neoclassical models effectively characterize the ideal operation of the firm. They determine optimal pricing and production strategies of the firm and provide responses to market and economy constraints. In general, they form a theoretical window through which managers may view the consequences of their decisions. Neoclassical models even suggest optimal firm structure (amounts and types of labor and capital). These models are valuable guides to how a firm should be operated. The main limitation of the neoclassical model is extreme simplification of organizational form. The firm is considered a single individual with a clearly defined goal. Composite theorists have contended this assumption and significantly modified the results from ideal operation.

55 Zukin and DiMaggio (1990) cite three separate criticisms of the neoclassical theory of the firm. First, simple models cannot capture the complexity of the firm. Second, neoclassical models do not account for diverse employee motivations. Third, these models do not treat different organizational forms with the same rigor.
Composite Models of the Firm

With their antecedents in Berle and Means (1932) and Coase (1937), such models were developed by Jensen and Meckling (1976) and Fama and Jensen (1983a, 1983b), and are now quite popular in economics. Composite models assume the firm is a "legal fiction which serves as a nexus for a set of contracting relationships among individuals." In this context, the firm is an ensemble of heterogeneous individuals, each attempting to maximize personal utility within the limits of written and unwritten contracts. Firm performance is coincidental to the aggregate outcome of many individuals working for self-fulfillment. The structure and enforcement of internal contracts is paramount to firm efficiency. The owner of the composite firm must provide optimal incentives for employees and providers of capital in addition to determining optimal input and output quantities.

In their seminal agency theory paper, Jensen and Meckling (1976) examine the relationship between the owners and top management of a firm. They assume principals (owners) hire agents (managers) to achieve the goals dictated by neoclassical models. Principals expend resources to draft and enforce contracts with agents. Likewise, agents may incur bonding costs to prove their behavior is benign. Monitoring and bonding will reduce, but not eliminate, self-serving agent decisions. Agency costs are defined as the sum of monitoring and contracting expenditures by the principal, bonding expenditures by the agent, and the cost to the parties of any remaining aberrant decisions by the agents. Note that self-serving agent decisions are those which deviate from the optimal operation prescribed by a neoclassical model. In this way, composite models are refinements of neoclassical models. Agency theorists assert that agency costs largely determine the success of the firm.

Agency problems between managers and owners are primarily due to salary structure and risk bearing. Once a manager signs a contract providing only salaried compensation, the agent's primary interest is job maintenance. Work effort may decline and the firm's resources may be structured to minimize the chance of a takeover or failure. It is likely these arrangements are contrary to the designs of the owner. Even if the manager is compensated with equity shares, management's risk aversion will differ from remaining owners, resulting in investments structured for the manager, not owner. Additionally, owners equally bear the cost of profit-reducing managerial emoluments and embezzlement even though the manager receives all of the benefit. In a world of costly information and contracts, agency problems arise regardless of contract structure.

What can be done to reduce agency costs? For starters, markets often limit aberrant manager behavior. If the market for the firm's output is highly competitive, deviation from profit maximization may jeopardize the survival of the firm. A thick market for managers will expedite replacement of insubordinate management. Under-achieving firms may also be the target of takeover and consequent management change. Additionally, ownership may set up internal rules

56 Tinbergen (1988), in a unique review of both agency and transaction cost theory, presents them as intellectual vehicles materialistically grounded in social conflict.

to limit agent deviations, such as constraints on office expense, travel, and personnel. More effective monitoring and auditing will reduce manager deviations, but monitoring costs are part of agency costs. Owners will increase monitoring until the dollar reduction in manager deviation equals marginal monitoring expense.\textsuperscript{58}

Much of the subsequent work on composite models is an extension of agency theory. Alchian and Woodward (1987) propose conditions under which agency problems are likely to occur. They assert managers of "plastic" resources, i.e., resources with many legitimate uses, are more likely to deviate from the course desired by the owners. They also conclude mutuals will generally accumulate more equity than stock corporations. Fama and Jensen (1983a) hypothesize that firms with distinct owners and managers survive despite agency costs because different groups execute and monitor decisions. If one group both executes and monitors the major operating decisions, that group also generally owns the firm. Fama (1980) does away with the concept of corporate ownership and assumes all individuals involved with the firm, even equity holders, are simply resource suppliers. He uses thick managerial markets to demonstrate deviations can be controlled.\textsuperscript{59}

\textbf{Theoretical Composite Models of the Credit Union}

In contrast to the wide range of neoclassical credit union models discussed in Chapter 2, not a single composite model of the credit union exists.\textsuperscript{60} Jensen and Meckling (1976) note, "the problem of inducing an agent to behave as if he were maximizing the principal's welfare is quite general. It exists in all organizations and in all cooperative efforts." They further claim the application of agency theory to specific firm types will "lead to a rich theory of organizations which is now lacking."\textsuperscript{61} Since there is essentially no credit union research to review, this section suggests ideas for researchers interested in applying agency theory to credit unions. Conditions which foster agency problems include division of ownership and control, monitoring difficulties, unclear goals, and a complex contract structure.

The credit union has a unique ownership/control relationship because of the vagueness of ownership. The one-member, one-vote rule ensures no single individual owns the firm. Members elect a volunteer board of directors, who in turn select salaried managers.\textsuperscript{62} A conceptual barrier exists between the three groups, setting up a potentially costly situation. Sponsor firms add

\textsuperscript{58}This point illustrates the role of marginal analysis in behavioral modeling. It would be a mistake to presume that composite theories incorporate non-economic axioms. In fact, composite models apply micro-economic analysis more stringently than ad hoc entity models. The difference between the two models is not analytical technique, but specification of the fundamental particle of economics. Entity models assume that both firm and individual are primitive, while behavioral models start with the individual. Differing simplicity and preciseness needs make both models valuable.

\textsuperscript{59}Moe (1984) provides a useful summary of these and other behavioral issues.

\textsuperscript{60}The Keating (1975, 1976) model assumes that managers maximize "profits" (the specification is complex) and surrender a fixed amount to the members. Managers then consume any remaining profits. While this model has composite elements, it is based upon the Williamson (1964) model, a precursor to the Jensen and Meckling (1976) agency model. As such, the Keating model is not particularly relevant to our discussion of agency theory.

\textsuperscript{61}Garven (1987), for example, applies agency theory to the insurance firm.

\textsuperscript{62}Weidman (1988) describes credit union political structure with anecdotal evidence of board objectives.
another dimension to the agency situation. Although sponsors have no explicit control of the credit union, their ability to "punish" the credit union by reducing subsidies may play an important role in agency analysis.

There are some peculiar monitoring situations within the credit union. Members who regularly use the credit union can inspect performance. Rates on loans and deposits are published, service quality is relatively apparent; and the expense of office furnishings and personnel can be estimated. In this respect, monitoring costs are low. Directors can closely monitor managers because credit unions are subject to audits for regulatory and insurance purposes. These reports are generally unbiased accounts of credit union operation. However, the credit union exemption from SEC requirements is a barrier to effective monitoring. Also, credit union annual reports are usually less informative than those of publicly traded firms. Hancock (1988) found the disclosure practices of Australian credit unions were deficient and similar research on U.S. credit unions is warranted.

The problem of defining an objective for the credit union as an entity was discussed at length in Chapter 2. The goals of individuals within the credit union are perhaps more complex. Credit union members have sharply contrasting goals – borrowers want low loan rates and savers want high deposit rates. The credit union is unique in having such distinctly aligned voting groups. The goals of the directors are not clear. They are generally forbidden from accepting monetary compensation, although they can be reimbursed for "legitimate business expense." Their operational preferences are also unknown. Older board members with large savings balances may align themselves with other savers. Young board members may prefer increases in equity insuring future growth of services, more lenient underwriting standards for loans, and/or lower interest rates. There is a definite need for research examining board members' objectives. The credit union manager is in much the same situation as the for-profit firm manager. The manager's objectives will depend upon compensation structure, staff quality, the market for managers, short-term financial needs, etc.

Agency costs also depend on contract structure, which includes all written and unwritten pacts among credit union participants. For example, credit union bylaws are a collection of contracts suited to agency analysis. The board member nomination process, as well as the length of term, dictates member control of the board. Management compensation is an important determinant of agency cost. The share rate "contract" is conspicuous because announced rates are not binding. The uniqueness of credit union contract structure seems ideally suited to agency study.

Overall, it appears agency theory has much to say about credit union operation. Contract structure and disposition of individuals lends itself to potentially deviant behavior. Presently, there is no reliable model of member, participant relationships. Analytical tools as simple as utility functions and budget constraints might produce major operational breakthroughs.

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63 As noted earlier, treasurers may receive direct remuneration.

64 We should emphasize that the question of "deviating from what?" has not been fully resolved. Continued innovation of the credit union objective function will have implications for composite theories.

65 See Jensen and Meckling (1976).
Empirical Composite Models

Empirical agency theory research gauges managerial deviation from ownership goals. The lack of such research in the credit union field is not surprising since there are not yet significant theoretical developments. We turn to the banking literature for agency research precedent and analytical technique. Researcher frustration demonstrates the difficulty of preparing agency theory for empirical testing.

Edwards (1977) first tested for agency problems in banks. He hypothesized managerial deviation is reflected in excessive personnel expense. He regressed bank data on personnel expense against measures of market concentration, bank size, and bank complexity and concluded that expense-preference behavior by managers, a proxy for agency deviation, exists.

The Blair and Placone (1988) study of savings and loan data is a more recent example of agency research. Their technique is only a slight modification of Edwards', illustrating how little basic research has progressed. They expand Edwards' independent variable list to include the influence of mutual form on agency costs and find little support for expense preference. In the course of their study, Blair and Placone consider various theories and must often juggle differing implications. Opposing theories are found on the relationships between concentration and monopoly power, monopoly power and managerial deviation, and mutual form and owner control. The theoretical disarray of agency theory presently limits the power of empirical modeling, but these initial empirical studies should help focus theory. Boone (1990) performs a similar analysis on mutual life insurers. Mayers and Smith (1986) examine the profitability record of insurance companies that change their ownership/control structure (go public or private). This avenue of composite research may yield insight into the effect of ownership form on agency problems.

Empirical studies of agency costs in banks may not be directly applicable to credit unions. Researchers should scrutinize the main assumptions of these models before modifying them for credit unions. Personnel expenditures may not be a complete proxy for deviant behavior. Studies might consider other components of a manager's utility function, such as charitable donations, managerial stress, and nepotism. Additionally, size, complexity, and organizational form seem to be crude proxies for the extent of monitoring. Jenster and Overstreet (1990) contains the partial results of a credit union management and board survey. Only 35 percent of the credit unions in the sample formally plan operations. Large, professionally-managed credit unions are more likely to have a monitored plan than smaller board-operated credit unions. Creative modelers might find more suitable measures of managerial leeway. Credit unions need empirical estimates of agency cost, but such studies should be carefully considered to avoid bias.

Conclusion

Neoclassical theories treat the credit union as a homogeneous institution striving towards a well-defined goal. Nearly all existing credit union studies have implicitly accepted this model. A potentially more useful approach is to use a composite model view of the firm as a nexus for contracts among self-interested individuals. Despite an amenable organizational structure, credit unions have not yet been studied with composite models. The lack of composite model prevents accurate application of existing neoclassical models because composite models help prepare theoretical research for practical implementation. Methodologies already in use on other organizations have the potential to be fruitfully applied to credit unions.
Summary

More And Better Research Is Needed

The broad goal of fostering better credit union practice underlies this monograph's objective to stimulate focused, relevant research on these firms. Decision makers tend to make more informed choices when they have a framework within which to ponder the consequences of their actions. A robust set of positive theories will provide such a framework.

This monograph examined the factors making credit union research attractive. Credit unions offer researchers structural and cultural uniqueness, growing market position, and often controversial status. Prior to 1980, credit union research, hampered by an inadequate and inconsistent theoretical base, produced largely descriptive results. Although there has been significant progress in the last decade, academic research has yet to produce theory easily translated into enhanced credit union practice.

For example, no sound theoretical basis has been provided for analyzing what constitutes an optimal allocation of surplus to equitably serve credit unions' diverse member-owner segments. Treating the family of diverse individuals—current borrowers and savers as well as future members—in an optimal yet neutral fashion constitutes a challenging task for a credit union's volunteer board of directors. To further complicate matters, the deregulated world of the 1980s has produced what many practitioners consider to be a separate member segment—service users who neither borrow nor save. Clearly, existing theoretical models need further refinements.

Credit unions do not fit neatly into the standard neoclassical model of the profit-maximizing, shareholder-owned "firm." This partly accounts for the problems encountered in drawing practical conclusions from existing theory. Agency theory, which broadens the traditional "theory of the firm," offers great promise for amplifying credit union theory. Agency theory is especially pertinent to analyzing conflicts of interest arising among different segments of a credit union's membership—current borrowers, current savers, future borrowers and savers, management, and board members. These issues are inherent in many key credit union decisions such as building capital vs. offering new services, higher dividend rates or lower interest rates on loans. Given the current state of research, it is not clear how changing the benefits of one group affects the benefits of other groups. Positive analysis of such inherent conflicts using agency theory should be high on the research agenda.

Prior to deregulation, the world in which credit unions operated was relatively simple. It could be argued that research insights were unnecessary to insure the credit union movement's survival. However, today credit unions face an increasingly chaotic and hostile competitive environment. These "alternative" suppliers of financial services must better understand their inner workings and the environment in which they operate. The shortage of focused research presents an opportunity for researchers from diverse disciplines to make meaningful analytical and practical contributions towards meeting these needs.
In our experience members, managers, boards of directors and regulators welcome fresh insights into how they can resolve the many difficult issues their credit unions face. These practitioners also offer an acid test for research output. The most meaningful research results will be realized when researchers and practitioners freely communicate in developing relevant hypotheses and evaluating research results.
<table>
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<tr>
<th>Date</th>
<th>Number of Credit Unions</th>
<th>Members (millions)</th>
<th>Assets (billions)</th>
<th>Consumer Installment Credit</th>
<th>Auto Loans</th>
<th>Household Savings</th>
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<th>OBJECTIVES</th>
<th>CONSTRAINTS</th>
<th>IMPLICATIONS</th>
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<tr>
<td>Smith, Cargill, &amp; Meyer (1981)</td>
<td>Max $B_1 + S_1$</td>
<td>$B_1 = S_1$</td>
<td>Benefit maximization</td>
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<tr>
<td>Smith (1984)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smith (1988)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goopu &amp; Lombra (1987)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overstreet &amp; Rubin (1990)</td>
<td>Max $\sum b^t (B_1 + S_1)_t$</td>
<td>$0 &lt; b &lt; 1$</td>
<td>Max net present value of benefits;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$\sum b^t (B_1)_t = \sum b_t (S_1)_t$</td>
<td>Net present value equality.</td>
</tr>
<tr>
<td>Flannery (1974)</td>
<td>Max $B_2 + S_2$</td>
<td>$B_2 = S_2$</td>
<td>Benefit maximization</td>
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<td>Kohers &amp; Mullis (1987a)</td>
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<tr>
<td>Taylor (1971a)</td>
<td>Min $B_3 - S_3$</td>
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<td>Cost minimization</td>
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<tr>
<td>Taylor (1977)</td>
<td></td>
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<td>Sales maximization</td>
</tr>
<tr>
<td>Taylor (1979a)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Koot (1976)</td>
<td></td>
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<td></td>
</tr>
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<td>Murray &amp; White (1980)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Murray &amp; White (1983)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Navratil (1981)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hempel &amp; Yawitz (1977)</td>
<td>Maximize profits</td>
<td></td>
<td>Profit maximize</td>
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<tr>
<td>Chateau (1980)</td>
<td>Maximize Assets</td>
<td></td>
<td>Asset maximize</td>
</tr>
<tr>
<td>P.F. Smith (1971)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Keating (1975)</td>
<td>Maximize $M_1$</td>
<td>$S_4 = S_4'$</td>
<td>Profit maximize;</td>
</tr>
<tr>
<td>Keating (1979)</td>
<td></td>
<td></td>
<td>Fixed saver benefit</td>
</tr>
</tbody>
</table>

37
Table 2 (Continued)

Benefit Specifications And Objective Functions

**Borrower Benefit**

- \( B_1 \) = Best alternative loan rate less credit union loan rate \( \times \) credit union loan volume.
- \( B_2 \) = Best alternative loan rate less credit union loan rate.
- \( B_3 \) = Credit union loan rate.

**Saver Benefit**

- \( S_1 \) = Credit union deposit rate less best alternative deposit rate \( \times \) credit union deposit volume.
- \( S_2 \) = Credit union deposit rate less best alternative deposit rate.
- \( S_3 \) = Credit union deposit rate.
- \( S_4 \) = Composite measure of saver benefits (deposit rates, insurance, service, etc.)

**Other Variables**

- \( \Sigma (t) = \) The sum of \( () \) from \( t = 0 \) to \( oo \).
- \( b = \) Rate of time preference (discount rate).
- \( t = \) Time period label.
- \( \pi = \) Profit (operating income less operating expense).
- \( M_1 = \) Managerial emoluments.
- \( S_4' = \) Minimum level of \( S_4 \) required by savers.
<table>
<thead>
<tr>
<th>AUTHORS</th>
<th>SCOPE OF STUDY</th>
<th>CONCLUSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flannery (1974)</td>
<td>Usury ceilings and share rate limits</td>
<td>Credit unions should be subject to banking rules</td>
</tr>
<tr>
<td>Brockschmidt (1977)</td>
<td>Description of regulation</td>
<td>Credit union growth resulted from share insurance and superior pricing</td>
</tr>
<tr>
<td>Smith, Cargill, Meyer (1981)</td>
<td>Usury ceilings and share rate limits induce non-pecuniary benefits</td>
<td>Binding statutory</td>
</tr>
<tr>
<td>Black &amp; Dugger (1981)</td>
<td>Description of regulatory change</td>
<td>Regulatory changes made credit unions more competitive, balancing problems of complexity</td>
</tr>
<tr>
<td>Wolken &amp; Navratil (1981)</td>
<td>Usury ceilings</td>
<td>Binding ceilings reduce credit availability</td>
</tr>
<tr>
<td>Smith (1988)</td>
<td>Required reserves under uncertainty</td>
<td>Benefits decrease as cost of required reserves increases</td>
</tr>
<tr>
<td>AUTHOR</td>
<td>METHOD</td>
<td>CONCLUSIONS</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------------------</td>
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</tr>
<tr>
<td>Croteau (1956)</td>
<td>Expense/Income vs. Assets</td>
<td>Increasing returns to scale</td>
</tr>
<tr>
<td>Dran (1970)</td>
<td>Expense/Loan vs. Assets</td>
<td>Increasing returns to scale</td>
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<tr>
<td>Taylor (1972a)</td>
<td>Expense vs. Assets</td>
<td>Increasing returns to scale</td>
</tr>
<tr>
<td>Flannery (1974)</td>
<td>Expense vs. # of Accounts</td>
<td>Constant returns to scale</td>
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<td>Koot (1978)</td>
<td>Expense vs. # and Size of Accounts</td>
<td>Decreasing returns to scale</td>
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<tr>
<td>Taylor (1979b)</td>
<td>Factor Demand vs. Volume</td>
<td>Increasing returns to scale</td>
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<tr>
<td>Wolken &amp; Navratil (1980)</td>
<td>Expense vs. # and Size of Accounts and Wages</td>
<td>Increasing returns to scale</td>
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<td>Murray &amp; White (1980)</td>
<td>Expense vs. Assets</td>
<td>Increasing returns to scale</td>
</tr>
<tr>
<td>Fry, Harper, &amp; Stansell (1982)</td>
<td>Loan Processing Cost vs. Loan Volume</td>
<td>Increasing returns to scale</td>
</tr>
<tr>
<td>Murray &amp; White (1983)</td>
<td>Expense vs. Composite Output</td>
<td>Increasing returns to scale</td>
</tr>
<tr>
<td>Youn (1984)</td>
<td>Expense vs. Composite Output</td>
<td>Constant returns to scale</td>
</tr>
<tr>
<td>Kohers &amp; Mullis (1987b)</td>
<td>Various Transaction Costs vs. Assets</td>
<td>Increasing returns to scale</td>
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</table>
### Table 5

**Summary Of Credit Union Elasticity Studies**

<table>
<thead>
<tr>
<th>AUTHOR</th>
<th>METHOD</th>
<th>CONCLUSIONS</th>
</tr>
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<tr>
<td>Taylor (1972b)</td>
<td>Shares vs. Rate; Shares vs. Income</td>
<td>Modest income elasticity; modest interest elasticity</td>
</tr>
<tr>
<td>Flannery (1974)</td>
<td>Shares vs. Rate; Loans vs. Rate</td>
<td>Low interest elasticity for both</td>
</tr>
<tr>
<td>Koot (1976)</td>
<td>Shares vs. Rate; Shares vs. Income</td>
<td>Low income elasticity; modest interest elasticity</td>
</tr>
<tr>
<td>Chateau (1980)</td>
<td>Composite Deposits vs. Composite Rates; Income</td>
<td>High income elasticity; Modest rate elasticity</td>
</tr>
<tr>
<td>Chateau (1983)</td>
<td>Composite Rates; Income</td>
<td>Modest rate elasticity</td>
</tr>
<tr>
<td>Smith (1983)</td>
<td>Auto Loans vs. Loan Rate</td>
<td>High loan elasticity</td>
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<tr>
<td>Navratil (1981)</td>
<td>Shares vs. Rate; Shares vs. Income</td>
<td>Modest income elasticity; Modest rate elasticity</td>
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</table>
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48


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