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To the Graduate Council:

I am submitting herewith a dissertation written by Yvonne Hinson Stewart entitled "Who receives the benefit of credit unions' tax exemption? : an examination of net interest margins and agency costs." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Business Administration.

Kenneth E. Anderson, Major Professor

We have read this dissertation and recommend its acceptance:

Bruce K. Behn, Harold A. Black, M. Cary Collins

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

To the Graduate Council:

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Accepted for the Council:

Associate Vice Chancellor and
Dean of The Graduate School

Who Receives the Benefit of Credit Unions' Tax Exemption?:

An Examination of Net Interest Margins and Agency Costs

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University Of Tennessee, Knoxville

Yvonne Hinson Stewart

August 1997

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DEDICATION

To my husband,

David Bruce Stewart,

and our son,

Sean David Stewart

ACKNOWLEDGMENTS

I would like to gratefully acknowledge the assistance and guidance of those who have helped me in this academic achievement. First, I would like to thank my chairman, Dr. Kenneth E. Anderson. He has been helpful and supportive throughout my Ph.D. program and gave of his time generously during this dissertation project. In addition, my other committee members have each helped in countless ways. Dr. Harold A. Black shared his unique insight into credit unions and savings and loans and was especially helpful in addressing the form and content of this project. Drs. Bruce K. Behn and M. Cary Collins provided superb modeling and statistical counseling and were very helpful in strengthening my research proposal and final project. Additionally, I wish to express my sincere thanks to all of the faculty and doctoral students of the Department of Accounting and Business Law at the University of Tennessee, Knoxville. Their friendship, support, and comments have been helpful throughout this project and my program.

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ABSTRACT

Credit unions originally were granted tax-exempt status by the U.S. government to offer lower loan rates and higher deposit rates to low-income groups with an occupational, associational, or residential common bond. However, as credit unions increase in size and expand their range of services, and as the common bond weakens, other financial institutions increasingly see credit unions as a direct source of competition. These financial institutions argue that the government gives tax-exempt credit unions an unfair competitive advantage.

Credit unions must maintain a mutual ownership form for their tax-exempt status. Mutual ownership allows for greater separation of ownership and control than stock organizations. Agency theory contends that this separation of ownership and control can lead to an increase in management consumption of perquisites. If management is consuming more perquisites, the benefits gained from tax-exempt status are not accruing to the credit union members as the government originally intended. Increased perquisite consumption leads to higher costs than needed for an efficiently run organization.

This dissertation examines the net interest margin (the spread between loan and deposit rates divided by earning assets) between credit unions and mutual S&Ls for compliance with original government objectives. In addition, variables related to agency theory are assessed to determine possible areas of management perquisite consumption. OLS regression results indicate that credit unions are not passing along their tax subsidy to members through a lower net interest margin. In addition, credit unions have higher

total personnel and travel expenditures, higher other operating expenditures, and higher full-time equivalent employees per asset dollar than do mutual S&Ls, indicating that credit unions are subject to higher agency costs than mutual S&Ls.

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CHAPTER 1

INTRODUCTION

Banks and savings and loans (S&Ls) view credit unions as direct competitors. Unlike banks and S&Ls, however, credit unions are not subject to federal taxation. Banks and S&Ls consider this tax-exempt status unfair because it gives credit unions a competitive advantage. Specifically, credit unions can attract customers by offering lower loan rates and higher deposit rates than do banks and S&Ls. [1] In granting tax-exempt status to credit unions, the government intended that credit union members receive the benefit of this tax subsidy (Rose 1994). Thus, credit unions are achieving the government's objective if they have a lower spread between loan and deposit rates than do banks and S&Ls.[2]

On the other hand, credit union managers can divert all or some of the tax subsidy from members through increased perquisites or retained profits, such as high personnel and operating expenditures. This misallocated tax subsidy is an agency cost that both reduces the welfare of credit union members and frustrates the government's goal. Therefore, the empirical question is: who receives the benefit of credit unions' tax-exemption? In other words, how is this tax subsidy allocated between credit union members and credit union management?

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[1] Credit unions use the term dividends for interest paid on deposit accounts. In this study, the term deposit rates is used in place of dividends for consistency and clarity.

[2] The spread is the difference between loan interest revenue and deposit interest expense.

The answer to these questions has implications for credit union members, academic researchers, and tax policy makers.[3] If the spread between loan and deposit rates is not lower for credit unions than for other financial institutions with similar product mixes, credit union owner/members are not receiving the tax subsidy. From a personal wealth standpoint, credit union members should be concerned with how the tax subsidy is allocated.[4] If credit union management is consuming a portion of the tax subsidy through increased operating expenditures, current and future credit union members suffer a direct wealth loss.

This issue should be interesting to several groups of observers. Academic researchers are interested in organizations that involve possible agency problems. Credit unions are locked into a mutual organizational form with separation of ownership and control, providing researchers with an opportunity to study the impact of potential agency problems that arise from a mutual ownership structure. Tax policy makers should be concerned with the impact of tax laws and subsidies on competition, management cost allocations, and government objectives.

This dissertation compares credit unions with mutual S&Ls and empirically examines differences in loan rates, deposit rates, and operating expense allocations. Mutual S&Ls are used for comparison with credit unions because they have a customer base that closely resembles the customer base of credit unions and because mutual S&Ls have a similar ownership structure to credit unions.

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[3] See Overstreet and Rubin (1991) for a summary of the limited credit union research to date.
[4] Note that credit union members may not be concerned if they are receiving a better deal or at least as good a deal as they could get at other institutions.

The results indicate that no significant differences exist between the net interest margin, the loan and deposit rate spread divided by average earning assets, of credit unions and mutual S&Ls. An analysis of credit unions by charter type (federal and state) and member type (associational, occupational, and residential) provides evidence that only associational credit unions are passing along their tax subsidy to members through a lower net interest margin than that of mutual S&Ls. Therefore, most credit unions do not appear to pass along to their members the tax subsidy granted by the government.

Four variables are examined in separate OLS regression models to determine potential perquisite consumption by credit union management: total personnel and travel expenditures, other operating expenditures, full-time equivalent employees, and total fixed assets. Results indicate that the tax subsidy is consumed by management of credit unions, consistent with agency theory and perquisite consumption, through higher total personnel and travel expenditures per asset dollar, higher operating expenditures per asset dollar, and more employees per asset dollar than that of mutual S&Ls. Total fixed assets were insignificantly different or lower for credit unions than for mutual S&Ls. However, credit unions do total fixed assets per asset dollar increasing at a faster rate than do mutual S&Ls as total assets increase.

The remainder of the dissertation is as follows. Chapter 2 contains the relevant prior research and hypothesis development, Chapter 3 describes the research method, Chapter 4 discusses the results, and Chapter 5 describes the potential contributions and limitations.

CHAPTER 2

PRIOR LITERATURE AND HYPOTHESES DEVELOPMENT

This chapter surveys relevant prior literature and develops the research hypotheses. The discussion is divided into two sections. Section 2.1 discusses the government motives for tax exemption and develops the related hypothesis for testing credit unions' compliance with the original government intent. Section 2.2 describes potential agency costs related to the inherent separation of ownership and control in credit unions and sets forth hypotheses related to the agency costs.

Tax-Exempt Status

Government intervention usually is rationalized when markets fail to allocate resources efficiently and equitably (Boadway and Wildasin 1984). If market failure exists, the government can provide the service itself, offer subsidies, or allow the market failure to continue. The government may offer subsidies through tax exemptions to organizations that offer services the government does not want to provide directly. Credit unions originally were granted a tax subsidy for providing loan and deposit services to low-income individuals with a common bond. The common bond can be occupational, associational, or residential. Occupational common bonds are the most frequent, accounting for approximately 82% of all credit unions in 1990.[5]

[5] See Black and Schweitzer (1985) and Freid et al. (1993).

When credit unions first began in the United States in the early twentieth century, other financial institutions generally did not choose to offer services to low-income working class individuals and their families. The government allowed credit unions tax-exempt status as an incentive to provide services to this high-cost/low-revenue producing group. However, markets have changed. Consumer loans now generate high earnings and core deposits incur low costs. Moreover, in 1977 the U.S. government enacted the Community Reinvestment Act (CRA). CRA requires other financial institutions to provide deposit and loan services to low-income areas. Financial institution regulators closely monitor compliance with CRA, and banks and S&Ls found not complying face possible penalties and further monitoring.[6]

The CRA requirements force banks and S&Ls to target the same market that credit unions originally were granted tax-exempt status to serve. Other financial institutions, especially community banks and S&Ls, argue that they now serve the same markets as credit unions without the tax benefit.[7] These competitors contend that credit unions receive preferential treatment for providing the same services and that, given the current market, credit unions should no longer be afforded this favorable status.

Prior credit union research on taxation leads to contradictory conclusions. Taylor (1971), Flannery (1974), and Brockschmidt (1977) argue that credit unions should be

[6] The Financial Institutions Reform, Recovery, and Enforcement Act of 1989 requires public disclosure of a bank's CRA rating. The rating is based on how well a depository institution meets the needs of its local community. The FDIC Improvement Act of 1991 required further disclosure of CRA performance. This act requires disclosure of the reasons why a depository institution received a particular rating.

[7] Black and Dugger (1981) note that credit unions are more competitive with other financial institutions as a result of legislation passed in 1976, 1978, and 1980. This legislation authorized credit unions to offer longer loan maturities, 30-year mortgages, 15-year home improvement loans, and lines of credit.

taxed. They note the two most important reasons: (1) taxing credit unions will increase horizontal equity among financial institutions and (2) taxation will make other financial institutions more competitive by increasing the spread between credit union lending and deposit rates. The authors argue that credit unions should be taxed if their competitors are taxed. In the second argument, the authors imply that credit unions are passing along at least some of the tax subsidy to members through lower loan rates and higher deposit rates, an argument that this dissertation tests.

Alternatively, Cook and D'Antonio (1984) demonstrate mathematically that taxing credit unions would have two results. First, credit unions will have an incentive to eliminate tax payments by reducing loan rates and increasing deposit rates. The authors note that the favorable rates to members will reduce accounting profits; however, they do not address the effects of a reduced spread on other costs. Second, because of the reduced spread between loan and deposit rates, other financial institutions will become less competitive. This conclusion directly contradicts the arguments of Taylor (1971), Flannery (1974), and Brockschmidt (1977). Interestingly, Cook and D'Antonio's conclusions suggest that taxation of credit unions will result in credit unions complying with the original government intentions for tax-exempt status.

Credit unions maintain their tax-exempt status by serving owners who also are members with a common bond. The basis for tax exemption is that, when dealing with its members, an organization cannot generate income because all profit belongs to the owner/members (Code of Federal Regulation). Credit unions contend they are unable to

serve the general public, only members with the common bond. However, the common bond argument still may not hold.

Hall (1989) notes that the common bond may no longer be a valid argument for credit unions. An American Bankers Association report noted that, in the three years prior to 1989, manufacturing employment declined while membership at manufacturing-related credit unions increased by more than seven percent. This report suggests that credit unions are growing while their potential member base decreases, weakening the credit union common bond argument and rationale for tax-exempt status. In addition, federally-chartered credit unions currently are under attack for not complying with common bond requirements. Their case will be heard before the U.S. Supreme Court in Fall 1997. This study assesses differences between federal and state chartered credit unions as a sensitivity test.

The above arguments for taxing credit unions indicate the need for additional research into the operating characteristics of credit unions. Specifically, the question that needs addressing is: are credit unions complying with the original government objective of providing lower loan rates and higher deposit rates? Ideally, researchers would like to know whether low-income groups are benefiting from the existence of credit unions. Unfortunately, current data limitations preclude addressing this issue directly because data are unavailable on member profiles. However, empirical research can address the issue of lower loan rates and higher deposit rates compared to other financial institutions.

Loan and deposit rates vary by categories, and overall loan and deposit rates may vary based on a financial institution's product mix. Therefore, rather than directly comparing loan and deposit rates by institution, this study uses the net interest margin to evaluate credit union compliance with government intentions. The net interest margin (NIM) for an institution is the difference between loan interest revenues and deposit interest expense divided by earning assets.[8] Earning assets are all assets with an interest yield. NIM for an institution can be calculated as follows:

$$\frac{\text{Total Loan Revenue} - \text{Total Deposit Interest Expense}}{\text{Average Earning Assets}}$$

NIM is similar to the gross profit margin of a business and is used to cover the operating expenses incurred by the institution. The amount not used for expenditures or paid out to the owners results in net income for the institution. NIMs for credit unions and mutual S&Ls can be evaluated to determine whether the two forms of institutions maintain similar gross profit margins.

Evaluating NIMs is more informative than evaluating only loan and deposit rates because a credit union can engage in borrower-oriented, saver-oriented, or neutral behavior.[9] A borrower-oriented credit union offers preferential rates to borrowers over savers. A saver-oriented credit union maintains preferential deposit rates over loan rates. Neutral credit unions favor neither depositors nor borrowers, but have both lower loan rates and higher deposit rates. NIMs capture the profit margin regardless of the credit

[8] Using NIM instead of individual loan income and deposit expense is common in financial institution research. See, for example, Ho and Saunders (1981), Flannery (1981), Allen (1988), and Zarruk and Madura (1992).

[9] Flannery (1974) discusses borrower vs. saver-oriented credit unions.

union's orientation. Therefore, NIM is used instead of dividing the credit union sample into borrower, saver, and neutral-oriented behavior samples. This profit margin, as with all businesses, should be large enough to cover operating costs.

Taylor (1971, 1977, 1979) develops models for credit unions that focus on cost minimization. He asserts that credit unions should minimize their internal spread while still covering expenses. Minimizing the internal spread is synonymous with minimizing NIM because a credit union with a low internal (interest) spread has a low NIM.[10] The various strategies that institutions can practice (borrower-oriented vs. saver-oriented vs. neutral) are reflected in NIMs. Thus, NIMs will be evaluated for credit unions and mutual S&Ls. If credit unions are passing along tax subsidies to their members, credit union NIMs should be lower than NIMs of mutual S&Ls, leading to the following hypothesis:

H1: *The net interest margin (NIM) of credit unions is lower than the net interest margin (NIM) of mutual S&Ls.*

Agency Costs

Williamson (1963, 1964) was the first to offer an alternative theory to the traditional profit maximization model. The profit maximization model asserts that managers seek to maximize profits as their main goal. Williamson posits that managers seek to maximize their own utility and that managerial utility maximization can conflict with the interests of owners. Jensen and Meckling (1976) discuss these owner-manager

[10] The NIM of an institution is the internal (interest) spread divided by average earning assets.

conflicts as agency costs (agency theory) and relate them to managerial utility maximization. Jensen and Meckling argue that the firm is comprised of a series of contracts where principals delegate authority to agents. The principals can be owners (stockholders), borrowers, or members of a mutual institution. Agents are the managers of the institution. The utility functions of the principals and agents can differ, and the agent does not always act in the best interests of the principals.

According to Jensen and Meckling, there are three types of agency costs: (1) costs of monitoring by the principal, (2) costs of bonding by the agent, and (3) residual loss. The principal bears a residual loss when the agent's decisions differ from the principal's utility maximization function. Agency theory hypothesizes that agency costs exist in all firms and that only the degree of agency costs vary. Jensen and Meckling (1976,1979) and Fama and Jensen (1983a, 1983b) note that agency costs can be reduced through rules set forth by the principal in contracts, a combining of utility functions, and competition in the managerial labor market.

Although both credit unions and mutual S&Ls can incur agency costs, credit union managers are in a position to deviate further from the utility maximization of their principals than are mutual S&L managers. Agency theory suggests that the tax-exempt status of credit unions, the protection from certain regulations, and the lack of incentive for members to closely monitor managers (Shleifer and Vishny 1986) could cause credit unions to operate less efficiently than their taxable competitors. The credit union tax subsidy, if not used for lower loan rates and/or higher deposit rates, could be used to

cushion inefficient management. Under this scenario, management would receive at least some of the tax subsidy through inefficient allocation of resources. Inefficient allocation is accomplished by management consuming some of the subsidy themselves, for example with increased travel expenses, salaries, fixed assets, or personnel costs (Williamson 1963; Jensen and Meckling 1976). Managers may consume perquisites directly by increasing salary and benefits. They also may consume perquisites indirectly with extravagant facilities and with additional personnel, thereby reducing their workload.

Agency theory also holds that inefficient allocation of resources by management is considered a prevalent problem with certain ownership structures (Shleifer and Vishny 1986). Credit unions are a mutual form of ownership rather than a stock form. With stock ownership structures, large stockholders have significant control over the operations of the company (Verbrugge and Jahera 1981). Management also may be an owner in the stock company. In contrast, mutual ownership structures, such as credit unions, generally follow a one-member, one-vote plan. Each member has only one vote, and no member has a controlling interest.[11] Management of a mutual organization, therefore, may have more control over the day-to-day operations of the company than management of a stock organization. This separation of ownership and control inherent in mutual organizations further encourages agency problems and may lead to more opportunity for inefficient allocation of resources than in stock organizations.[12]

[11] Generally, voting rights are signed over to management when a member joins the credit union.
[12] Mester (1989, 1991) and Cebenoyan et al. (1992) look at mutual versus stock S&Ls prior to deregulation and find that mutual S&Ls experience greater agency problems than do stock S&Ls.

However, the ability of the owners to convert the organization to stock form discourages agency problems within mutual organizations. For example, S&Ls and savings banks have this option if their owners believe the stock form to be beneficial. Credit unions, on the other hand, do not have the conversion option available to them. If credit unions wish to maintain their tax-exempt status and keep their credit union charter, they must remain mutual organizations. The inability to convert from mutual to stock form protects management from the conversion market force and increases potential agency costs.

Agency theory literature (Williamson 1963 and 1964; Jensen and Meckling 1976; Edwards 1977) posits that, when possible, managers will seek to maximize their own utility through increased expenditures on personnel and other operating expenditures. Managers may pay themselves high salaries and/or hire additional employees to reduce their own workload. In addition, management can consume perquisites through increasing operating expenditures. The mutual ownership structure of credit unions discussed above particularly allows for the possibility of increased expenditures by management. Higher expenditures on employees and other operating costs by credit union management compared with mutual S&Ls provides evidence that credit union management is allocating costs inefficiently and may be consuming some of the tax subsidy through higher cost allocations.[13] Cost allocations will be examined with the following three hypotheses.

[13] Other operating costs are defined in this proposal as total operating costs less interest on deposits and all employee and travel expenditures.

H2: *Credit unions have higher total personnel and travel expenditures costs as a percentage of total assets than do mutual S&Ls.*

H3: *Credit unions have higher other operating expenditures as a percentage of total assets than do mutual S&Ls.*

H4: *Credit unions have higher full-time equivalent employees as a percentage of total assets than do mutual S&Ls.*

Managers of credit unions also can consume perquisites by surrounding themselves with more lavish surroundings than do their competitors. Credit union managers can use the tax subsidy to increase net income and retained earnings each year, and then use the built-up surplus to purchase additional fixed assets. Total fixed assets as a percentage of total assets may indicate how these retained earnings are used. For example, if credit union managers are using the tax subsidy to surround themselves with office buildings that cost more per asset dollar than other institutions, total fixed assets as a percentage of total assets will be higher for credit unions than for mutual S&Ls, leading to the last hypothesis:

H5: *Credit unions have higher total fixed assets as a percentage of total assets than do mutual S&Ls.*

CHAPTER 3

RESEARCH METHOD

Empirical tests are performed using univariate statistical tests and ordinary least squares (OLS) regressions. After selecting the sample of credit unions and mutual S&Ls, income statement and balance sheet data for the sample firms are analyzed with univariate t-tests to determine the descriptive differences between the two groups. OLS regressions test the hypotheses developed in Chapter 2.

The first section addresses the data sources and sample selection criteria. The second section describes the univariate, or mean-difference, tests and OLS regression models that are used to evaluate the data, and the third section discusses sensitivity tests.

Data and Sample Selection

Data from the years 1993 and 1994 are gathered and evaluated from the annual thrift and credit union tapes. The two years selected for evaluation represent a time period that did not include major legislative changes for credit unions or mutual S&Ls.[14]

Credit union data are gathered from the National Credit Union Association (NCUA) Yearend Call Reports for each year. To allow for greater geographic and competitive market control, only credit unions located in a metropolitan statistical area

[14] Several S&L legislative acts prior to 1992 contained ramifications that could affect the results of the study. The Financial Institutions Reform, Recovery, and Enforcement Act of 1989 (FIRREA) was designed to "restore public confidence in S&Ls" and limited S&L's ability to diversify their assets (Rose 1994). The Federal Deposit Insurance Corporation Improvement Act (FDICIA) in 1991 allowed regulators to more promptly evaluate and close institutions that were inadequately capitalized.

(MSA) are included in the study. Controlling for cost of living differences by using geographic location or the MSA is consistent with prior research.[15]

Some credit unions receive donated resources from an associated sponsoring entity.[16] Because credit unions receiving donated resources are not incurring comparable expenses with their non-sponsored credit union or S&L competitors, sponsorship of some expenses could affect the results and hypotheses in this study. Therefore, all credit unions receiving sponsor-donated services are identified and removed from the sample. Deleting sponsored credit unions is consistent with prior credit union research and results in removal of approximately 40% of the credit unions from the total credit union sample.[17]

Mutual S&L data are gathered from the yearly *Statements of Operations* and *Statements of Condition* on the S&L (thrift) tapes. Only mutual S&Ls are used in the analysis because they have the same ownership structure and similar customer base as credit unions.[18] Both credit unions and mutual S&Ls target the consumer market rather than the commercial market. Therefore, comparing credit unions with mutual S&Ls provides a means of testing the effect of taxation on similar financial institutions while holding the type of ownership structure constant. Like credit unions, mutual S&Ls also must have an assigned MSA for inclusion in the study.

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[15] Hourly wage rates are needed to control for the differing costs of labor across the country. Hourly wage rate data only are available for MSAs. See Nelson (1985), Verbrugge and Jahera (1981), and Edwards (1977) for examples.

[16] Sponsorship can take the form of donated personnel, travel expenses, office supplies, and/or office space from the sponsoring entity.

[17] Fried et al. (1993) find that approximately one-third of their sample received sponsorship.

[18] S&Ls (thrifts) have a mutual ownership structure if the sum of capital stock accounts is zero. Therefore, if the common stock, preferred stock, and additional paid-in-capital accounts are zero, the S&L is a mutual organization.

Financial institutions are required by regulators to maintain certain minimum levels of capital. Inadequate capitalization can directly affect the results of this study. Institutions with inadequate capitalization may have higher NIMs while building up their capital than they will have after an acceptable capital level is achieved. Prior researchers have used three years as an adequate time period for firms to build up needed levels of capital (Black and Dugger 1981). Therefore, all financial institutions included in the study must have been in existence for at least three years.

Data Analysis

Univariate Analysis

Univariate techniques are used to identify data characteristics, including any miscoded or anomalous entries. Mean, maximum, median, and minimum values for each variable are examined. The analysis of each variable is separated by type of institution to determine whether, a priori, differences potentially exist between credit unions and mutual S&Ls.

In addition, Pearson correlation coefficients are examined to determine any potential collinearity between variables. Correlation between variables in a model can increase the variances of the coefficients and may provide unstable results. Therefore, reduced-form models are evaluated in cases where collinearity among independent and control variables is a possibility. Stability of coefficients across the full and reduced

models mitigates the probability that collinearity among independent and control variables is inflating variances and affecting results.

Each variable also is evaluated separately with univariate t-tests by type of institution. Univariate t-tests assess differences between credit unions and mutual S&Ls by measuring the differences in means between the two groups for each variable. Differences found between the two groups further substantiate the need to control for sample differences in the OLS regression models. In addition, significant differences in the independent variables by type of institution (credit union versus mutual S&L) provide preliminary support for the hypotheses. However, further analysis with OLS regression models modifies results in some cases. OLS models incorporate other independent and control variables, leading to more reliable results than univariate statistics.

OLS Regression Models

The hypotheses set forth in Chapter 2 are tested using OLS regressions. The first hypothesis tests compliance with the requirement that credit unions pass along their tax subsidy to members through either lower loan rates, higher deposit rates, or some combination of lower loan rates and higher deposit rates. The remaining four hypotheses test for potential agency costs believed inherent in credit unions. The analysis in this chapter includes five separate OLS models, one for each of the five hypotheses set forth in Chapter Two. Five models are used to test the independent variable effects on each dependent variable separately. This study is the first research study comparing credit

unions with another organizational form. Therefore, models are analyzed separately to determine basic differences between credit unions and mutual S&Ls. However, net interest margins, total personnel and travel expenditures, and other operating expenditures may be determined simultaneously by institutions. Simultaneity of decisions is a topic for future research, as discussed in Chapter 5.

Model 1

Net Interest Margin (H1). Hypothesis 1 is tested using net interest margin (NIM) as the dependent variable, where NIM is the spread between loan interest revenue and deposit interest expense divided by average earning assets. NIM is a function of the type of institution, financial choices made by management, the environment in which the institution operates , and the size of the institution as follows:

NIM = f (institutional type, operating expenditures, product mix, risk, capital, operating environment competitiveness, size).

The independent dichotomous variable TYPE identifies institutional type and is coded 0 if the observation is a mutual S&L and 1 if the observation is a credit union. If credit union management is passing the benefits of a tax subsidy to depositors, borrowers, or both, TYPE should be negative and significant in the regression, indicating that credit unions have a lower NIM than do mutual S&Ls through a combination of lower loan rates and/or higher deposit rates.

In addition to TYPE, two variables assessing operating expenditures also may have a direct effect on the NIM of an institution. The amount management allocates to total personnel and travel expenditures (TPT) and other operating expenditures (OPERATING) can explain differences in NIMs.[19] If an institution has a high NIM, or a high profit margin, that institution has more money available from current operations to spend on personnel and operating expenditures than does an institution with a low NIM. TPT and OPERATING are evaluated as independent variables and as interactions with TYPE to determine whether differences between the dependent and independent variables are further explained by institutional type at changing levels of TPT and OPERATING.[20] As discussed above, the TYPE variable in the model tests H1, or credit union compliance with the original government objective of lower NIMs through lower deposit rates, higher loan rates, or some combination of lower loan rates and higher deposit rates than other financial institutions. In addition, the interaction terms in this model, TYPE*TPT and TYPE*OPERATING, may lend support to H2 and H3, which test the cost structure of credit unions as compared to mutual S&Ls.

Control variables are needed in the analysis to account for other differences in the dependent variable not captured by the independent variables. Both credit unions and mutual S&Ls target the consumer market. However, the product mix can vary somewhat

[19] TPT includes all employee and director compensation as well as all travel expenditures. Travel expenditures are included because S&Ls compensate their directors monetarily, while credit unions compensate their directors by paying expenses to meetings and conferences. The OPERATING variable does not include personnel wages and benefits, travel, and deposit expenses, which are tested in other variables.

[20] See Appendix G for an interpretation of interaction terms in the regression.

from institution to institution. Variations in product mix can cause differences in average loan and deposit rates, as well as differences in default risks. Therefore, product mix variations are evaluated and controlled for in the analysis. Product mix variables frequently are used in financial institution analyses because the products are seen as outputs of the financial institution.[21] For instance, mutual S&Ls engage in mortgage lending more than do credit unions. Therefore, mutual S&Ls are expected to have a higher percentage of mortgages, while credit unions are expected to have a higher percentage of consumer loans.[22] These differing product mixes can lead to differences in NIMs and, therefore, are needed as control variables when evaluating NIMs. Product mix control variables in this study include total mortgages divided by total loans (MORTGAGE), regular checking and savings deposits divided by total deposits (REGDEP), and total investments divided by total assets (INVEST).

Institutions may engage in different risk strategies when making loans and these different risk strategies can affect NIMs. Although the exact risk-taking behavior of an institution is not known, a proxy for risk behavior can be developed. Wahlen (1995) notes that bank consumer loan charge-offs (net of recoveries) provide a relatively nondiscretionary measure of default risk. Beatty et al. (1995) find that loan charge-offs and provisions reflect loan quality. Total loan charge-offs divided by total loans (RISK) is used as a proxy for risk behavior in this study.

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[21] See, for example, Wahlen (1995), Fried et al. (1993), Mester (1989, 1991, 1993), Blair and Placone (1988), and Verbrugge and Jahera (1981).

[22] Consumer loans include education, automobile, mobile home, credit card, and personal loans.

NIMs also can vary as a result of the amount an institution has accumulated in capital. Institutions that have large amounts of accumulated capital may rely on this capital for operating funds rather than generating all operating funds from the NIM. An institution with large amounts of accumulated capital may have built up this capital through increased NIMs in previous years. A capital ratio, total equity divided by total assets (K), controls for any differences in equity as a percentage of total assets.

A concentration ratio indicates the degree of competition a financial institution faces in a market or an MSA. A high concentration ratio signifies a high degree of monopoly in the MSA. In a monopolistic market, institutions can charge higher loan rates and lower deposit rates than in a more competitive market. As institutions battle for customers, high levels of competition can drive deposit rates higher and loan rates lower than in monopolistic markets.

The most common concentration ratio is the Herfindahl Index (HI). When reviewing mergers between banks in a market, the Department of Justice (DOJ) uses a variation of the HI, the Herfindahl-Hirschman Index (HHI). The HHI is calculated by summing the squares of the deposit market shares of banking organizations operating in the market.

A variation of the HHI is calculated for the current study. The deposits used in the index will include consumer deposit accounts from all banks, S&Ls, and credit unions in an MSA. Commercial accounts are not used because credit unions are not competing with other financial institutions in those market segments. Therefore, the index for this study

includes only the consumer deposits that credit unions have in common with banks. Bank data are gathered from the yearly FDIC Call and Income tapes.

The natural log of assets (SIZE) also is included as a control variable in the model. The log minimizes the effects of extreme observations. In addition, economies of scale may exist for larger institutions, leading to lower required NIMs for larger companies. An indication of possible economies of scale is a negative relationship between SIZE and NIM.

The above variables are analyzed with an OLS regression model as follows:

$$\mathbf{NIM} = \beta_0 + \beta_1\,(\mathbf{TYPE}) + \beta_2\,(\mathbf{TPT}) + \beta_3\,(\mathbf{OPERATING}) + \beta_4\,(\mathbf{TYPE*TPT}) + \beta_5\,(\mathbf{TYPE*OPERATING}) + \beta_6\,(\mathbf{MORTGAGE}) + \beta_7\,(\mathbf{REGDEP}) + \beta_8\,(\mathbf{INVEST}) + \beta_9\,(\mathbf{RISK}) + \beta_{10}\,(\mathbf{K}) + \beta_{11}\,(\mathbf{HHI}) + \beta_{12}\,(\mathbf{SIZE}) + \varepsilon. \qquad (1)$$

Model 2

Total Personnel and Travel Expenditures (H2). If management chooses to retain the benefits from tax-exempt status, credit unions can offer employees higher wages and benefits per asset dollar than do mutual S&Ls. Management often consumes perquisites through increased expenditures on personnel and through excess travel expenditures.[23] Although mutual S&Ls provide compensation for their directors, credit unions do not pay their directors. Credit unions compensate the directors by paying their travel expenses to conferences and meetings. Total personnel wages and benefits, as well as travel

[23] See Jensen and Meckling (1976) and Edwards (1977).

expenditures, for the year divided by total assets (TPT) provides a measure of the total amount an institution spends on employees and directors as a percentage of total assets. TPT is a function of the following:

TPT = f (institutional type , net interest margin, other operating expenditures, fixed assets, number of employees, product mix, cost of labor, risk, operating environment competitiveness, size).

Total personnel expenditures include all expenses related to employee compensation and benefits for the year.[24] Travel expenditures are included with total personnel expenditures because credit unions compensate their directors by paying expenses to meetings and conferences. A significant positive sign on TYPE indicating that credit unions are compensating employees and directors significantly more as a percentage of assets, after controlling for the number of employees, than are mutual S&Ls provides support for hypothesis 2.

In addition, NIMs may affect the amount an institution can spend on personnel. A larger spread between loan rates and deposit rates gives an institution additional operating funds to spend that may be used on personnel expenses. However, any funds allocated to personnel are unavailable for other operating expenditures (OPERATING). Therefore, NIM and OPERATING are included as independent variables of interest. The interactions of NIM and OPERATING with TYPE will provide insight into allocations of funds by credit unions relative to mutual S&Ls.

[24] Personnel expenditures on the credit union financial statements are labeled "Employee Compensation and Benefits." On the financial statements of mutual S&Ls, personnel expenditures are labeled "All Personnel Compensation and Expense."

A larger institution relative to total assets may require additional employees, which will increase TPT. Therefore, total fixed assets divided by total assets (FIXED) is included as a control variable. FIXED is expected to be positively related to TPT.

The number of employees at an institution can affect the total amount spent on personnel. Full-time equivalent employees (FTE) is included as a control variable and equals full-time employees plus half of the number of part-time employees divided by the log of total assets.[25] The number of full-time equivalent employees is expected to be positively related to TPT.

The product mix of an institution may affect total expenditures on personnel and travel. MORTGAGE, REGDEP, and INVEST are included as control variables in the model. MORTGAGE and INVEST are expected to be negatively related to TPT because mortgages and investments require less employee service than do consumer loans. REGDEP is expected to be positively related to TPT because regular deposits require more employee service than do other deposits. Other deposits include IRA and Keogh accounts and large CD's (over $100,000).

The hourly manufacturing wage rate (WAGERATE) in an MSA controls for differing labor costs across markets. The hourly manufacturing wage rates are available from the Bureau of Labor Statistics for each year and are used because hourly data for other industries are not available.

RISK, HHI, and SIZE, described in the previous section, also are used as control variables in the TPT model. More employees may be needed to handle riskier portfolios;

[25] This calculation assumes all part-time employees work half-time.

therefore, RISK is expected to be positive. HHI is expected to be positive, indicating that more monopolistic institutions, or less competitive markets, have higher personnel expenses. SIZE should be negatively related to TPT as some economies of scale are expected.

The above variable relationships are evaluated through the following OLS regression model:

$$\mathbf{TPT} = \beta_0 + \beta_1\,(\mathbf{TYPE}) + \beta_2\,(\mathbf{NIM}) + \beta_3\,(\mathbf{OPERATING}) + \beta_4\,(\mathbf{TYPE*NIM}) + \beta_5\,(\mathbf{TYPE*OPERATING}) + \beta_6\,(\mathbf{FIXED}) + \beta_7\,(\mathbf{FTE}) + \beta_8\,(\mathbf{MORTGAGE}) + \beta_9\,(\mathbf{REGDEP}) + \beta_{10}\,(\mathbf{INVEST}) + \beta_{11}\,(\mathbf{WAGERATE}) + \beta_{12}\,(\mathbf{RISK}) + \beta_{13}\,(\mathbf{HHI}) + \beta_{14}\,(\mathbf{SIZE}) + \varepsilon. \quad \mathbf{(2)}$$

Model 3

Other Operating Expenditures (H3). Management may consume perquisites through outlays unrelated to employees. A common example is higher expenditures on office supplies per asset dollar.[26] To test hypothesis 3, total other operating expenditures divided by total assets (OPERATING) is examined as the dependent variable. OPERATING is defined in the following function:

OPERATING = f (institutional type, net interest margin, total personnel and travel expenditures, total fixed assets, number of employees, product mix, operating environment competitiveness, size).

[26] See Jensen and Meckling (1976).

A significant positive sign on TYPE indicates that credit unions spend more on other operating expenditures than do mutual S&Ls.

NIMs may affect OPERATING in much the same way as they affect TPT, as discussed above. Therefore, NIM is included as an independent variable in this model. In addition, TPT is included as an independent variable because the amount an institution spends on TPT may affect the amount it spends on OPERATING if a trade-off exists between the two expenditures. Alternatively, an institution that consumes perquisites may do so through both personnel and other operating expenditures. NIM and TPT interactions with TYPE also are assessed in this model to determine any differences by institutional type. These interaction terms lend support for hypotheses 1 and 2 by providing evidence on how credit union management, as opposed to mutual S&L management, allocate resources to OPERATING as NIM and TPT increase.

The amount an institution spends on other operating expenditures may be influenced by the size of the fixed assets. A larger facility may require more expenditures in terms of supplies, maintenance, depreciation, etc. Therefore, FIXED is included as a control variable and is expected to be positively related to OPERATING.

The product mix of an institution also may affect the amount of other operating expenditures. Certain products are more expensive to maintain than others. For example, consumer loans are more expensive to maintain than mortgages. Therefore, MORTGAGE, REGDEP, and INVEST are included as control variables in the analysis. Just as with the TPT model above, MORTGAGE and INVEST are expected to be

negatively related to OPERATING, while REGDEP is expected to be positively related to OPERATING.

FTE, HHI, and SIZE, described above, also are included in this model as control variables. FTE and HHI are expected to be positively related to OPERATING. Additional employees may require additional operating expenditures, and monopolistic companies are expected to spend increased amounts on operating expenditures. SIZE is expected to be negatively related to OPERATING due to economies of scale.

H3 is evaluated with the following OLS regression model:

$$\mathbf{OPERATING} = \beta_0 + \beta_1\,(\mathbf{TYPE}) + \beta_2\,(\mathbf{NIM}) + \beta_3\,(\mathbf{TPT}) + \beta_4\,(\mathbf{TYPE*NIM}) + \beta_5\,(\mathbf{TYPE*TPT}) + \beta_6\,(\mathbf{FIXED}) + \beta_7\,(\mathbf{FTE}) + \beta_8\,(\mathbf{MORTGAGE}) + \beta_9\,(\mathbf{REGDEP}) + \beta_{10}\,(\mathbf{INVEST}) + \beta_{11}\,(\mathbf{HHI}) + \beta_{12}\,(\mathbf{SIZE}) + \varepsilon. \quad \mathbf{(3)}$$

Model 4

Full-Time Equivalent Employees (H4). Management also can hire additional employees to decrease the workload. Hypothesis 4 is tested using full-time equivalent employees divided by the natural log of total assets (FTE) as the dependent variable. FTE is a function of the following:

FTE = f (institutional type, net interest margin, product mix, cost of labor, operating environment competitiveness, size).

A significant positive sign on TYPE indicates that credit union management hires more employees as a percentage of total assets than do mutual S&Ls, and provides support for H4.

The net interest margin of an institution will affect the amount available to spend on employees. An institution may use funds available to pay each employee a higher wage, or it may use funds to hire additional employees, thereby reducing workload per employee. NIM is included to assess whether high NIMs are associated with high FTEs.

The product mix of an institution will affect the number of employees needed to service accounts and investments. Therefore, MORTGAGE, REGDEP, and INVEST are included as control variables in the model. MORTGAGE and INVEST are expected to be negatively related to FTE because fewer employees are needed to service mortgage loans and investments than consumer loans. REGDEP is expected to be positively related to FTE because regular deposits require more employees than are needed to service other deposits.

WAGERATE, HHI, and SIZE also are used as control variables in the model. WAGERATE is expected to be negatively related to FTE. Both HHI and SIZE are expected to be positively related to FTE. In addition, an interaction between SIZE and TYPE is included in the model.

H4 is evaluated with the following OLS regression model:

$$\mathbf{FTE} = \beta_0 + \beta_1\,(\mathbf{TYPE}) + \beta_2\,(\mathbf{NIM}) + \beta_3\,(\mathbf{MORTGAGE}) + \beta_4\,(\mathbf{REGDEP}) + \beta_5\,(\mathbf{INVEST}) + \beta_6\,(\mathbf{WAGERATE}) + \beta_7\,(\mathbf{HHI}) + \beta_8\,(\mathbf{SIZE}) + \beta_9\,(\mathbf{TYPE*SIZE}) + \varepsilon \qquad \mathbf{(4)}$$

Model 5

Total Fixed Assets (H5). In addition to the above strategies, credit union management can capitalize on their tax advantage by increasing personal utility and related agency costs through increased expenditures on buildings and offices per asset dollar. These increases are measured by evaluating fixed assets relative to total assets (FIXED) as the dependent variable. FIXED is a function of the following:

FIXED = f (institutional type, capital, operating environment competitiveness, size).

A significant positive sign on the TYPE variable supports hypothesis 5, indicating that credit unions spend more on fixed assets as a percentage of total assets than do mutual S&Ls.

K, HHI, and SIZE are included as control variables in the model. In addition, a TYPE by SIZE interaction term is included to assess differences by institutional type as size changes.

H5 is evaluated with the following OLS regression model:

$$\mathbf{FIXED} = \beta_0 + \beta_1\,(\mathbf{TYPE}) + \beta_2\,(\mathbf{K}) + \beta_3\,(\mathbf{HHI}) + \beta_4\,(\mathbf{SIZE}) + \beta_5\,(\mathbf{TYPE*SIZE}) + \varepsilon. \quad \mathbf{(5)}$$

Sensitivity Tests

Data analysis includes a credit union breakout by organizational structure. The credit unions are divided into occupational, associational, and residential common bond

categories. The OLS regression models are analyzed with the full sample of mutual S&Ls and the breakout sample of credit unions.[27]

Credit unions are examined by charter status as well. State-chartered credit unions, which comprise approximately 40% of the total credit unions sample, have weaker common bond restrictions for membership than do federally-chartered credit unions (Black and Dugger 1981).[28] The weaker common bond restrictions enhance state-chartered credit unions' ability to compete more directly with other financial institutions for consumers than the federally-chartered credit unions.

[27] Occupational credit unions are the most common and will be analyzed. They account for approximate 82% of all credit unions (Fried et al., 1993). Analysis of the remaining organizational structures is dependent on sample size.

[28] State-chartered credit unions comprise approximately 61% of the Black and Dugger (1981) study.

CHAPTER 4

EMPIRICAL RESULTS

This chapter presents the empirical results of the data analysis. The first section discusses sample selection, the second section describes univariate results, the third section discusses OLS regression results, and the chapter concludes with an overall summary of the results.

Sample Selection

Table 1 below summarizes final sample sizes for the full samples. This study attempts to find credit unions and mutual S&Ls with similar customer bases and business opportunities to eliminate differences other than tax-exempt status. Therefore, the following credit unions and mutual S&Ls have been deleted from the total population for several reasons. First, credit unions are assessed for sponsorship. If a credit union is sponsored, its employee compensation and travel, operating expenditures, or fixed assets may be zero. These sponsored credit unions are deleted from the sample. Second, all institutions outside an MSA are deleted. This screen is critical for collection and matching of reliable environmental control variables. Third, institutions in MSAs for which wage rate data are not available are deleted. Fourth, each MSA included in the study is required to include at least one credit union and one mutual S&L. Thus, any institutions in an MSA without this joint requirement are deleted. Fifth, institutions with missing data on

Table 1: Sample Sizes for 1993 and 1994 Full Samples

	1993		1994	
Reason for Deletion	Credit Unions	Mutual S&Ls	Credit Unions	Mutual S&Ls
Total Population	12,625	837	12,235	676
Sponsored	(5,204)	N/A	(5,070)	N/A
No MSA Indicated	(22)	(304)	(33)	(232)
No MSA Data Available	(2,327)	(54)	(2,203)	(33)
No Joint TYPE in MSA	(745)	(40)	(125)	(32)
Missing Data	(186)	(0)	(255)	(4)
Data Specification	(2,424)	(54)	(2,922)	(3)
Final Sample Size	**1,717**	**385**	**1,627**	**372**

any variables included in the model also are deleted.

Lastly, certain data specifications are included to arrive at a sample of credit unions and mutual S&Ls that closely resemble each other. Institutions with the MORTGAGE variable equal to zero or one are deleted because an institution with MORTGAGE equal to zero is a credit union without mortgage lending powers, and an institution with MORTGAGE equal to one is a mutual S&L with no consumer loans.

Many credit unions in the population are small institutions without comparable mutual S&Ls in the sample. In addition, one credit union is much larger than any comparable mutual S&L. Therefore, credit unions with total assets below $5.9 million and above $4.2 billion in 1993, and below $5.2 million and above $4.2 billion on 1994, are deleted. Deletion of these credit unions removes extreme observations and provides a sample with both credit unions and mutual S&Ls in the ranges described for each year.

Institutions that have not been in existence for at least three years are deleted. Institutions need three years to build up capital reserves that meet regulatory

requirements. In addition, institutions with capital accounts less than zero are deleted. These institutions may have a going concern problem, and this study attempts to assess relationships in stable institutions.

After all deletions, the final sample includes 1,717 credit unions and 385 mutual S&Ls in 1993, and 1,627 credit unions and 372 mutual S&Ls in 1994. Of the 1993 credit unions, 1,025 were federally-chartered and 692 were state-chartered. Federally-chartered credit unions totaled 995 in 1994, while state-chartered credit unions numbered 632. Associational, occupational, and residential credit unions totaled 147, 1,447, and 123, respectively, in 1993 and 161, 1,358, and 108, respectively, in 1994.

Univariate Tests

Univariate Statistics

Tables A2 and A3 in Appendix A present 1993 and 1994 descriptive information for each of the variables used in the analysis. The descriptive results are presented by institutional type to reflect fundamental differences between credit unions and mutual S&Ls for each variable.

For purposes of this study, univariate t-test results are included to develop a general understanding of the differences between credit unions and mutual S&Ls. However, univariate results do not control for the correlation among independent variables or control for the level of impact across firms. Table A4 provides the univariate t-test results comparing credit unions with mutual S&Ls. All variables, with the exception

of RISK and WAGERATE have t-values significant at the $p<.01$ level. Therefore, fundamental differences do exist between credit unions and mutual S&Ls based on univariate t-tests. However, further testing using the OLS regression approach is necessary to control for the differences.

Univariate results for the dependent variables by type of institution provide preliminary assessments for the hypotheses discussed in Chapter 3. NIM is significantly higher for credit unions than for mutual S&Ls, leading to a rejection of H1. Therefore, prima facie evidence suggests credit unions are not passing their tax subsidy to members through lower interest spreads. In addition, TPT, OPERATING, and FIXED are all higher for credit unions than for mutual S&Ls, indicating that credit unions may have higher expenditures per asset dollar than do mutual S&Ls. These results support hypotheses H2, H3, and H5. FTE is significantly lower for credit unions than for mutual S&Ls, leading to a rejection of H4. Thus, credit unions may employ fewer full-time equivalent employees per asset dollar than do mutual S&Ls.

Pearson Correlation Coefficients

Table A5 reports the Pearson correlation coefficients among the analyzed variables. Correlation exists ranging between .001 and .856 in 1993 and between .001 and .846 in 1994. Table 2 below contains the correlation coefficients among the dependent variables in the five models. NIM, TPT, and OPERATING have a high positive correlation with each other. This correlation suggests that an institution with a high

Table 2: Correlation Coefficients Among Dependent Variables

Panel A: 1993

Variable[1]	TYPE	NIM	TPT	FTE	OPERATING	FIXED
TYPE	1.000					
NIM	.431	1.000				
TPT	.728	.717	1.000			
FTE	-.163	-.057	-.109	1.000		
OPERATING	.699	.702	.856	-.135	1.000	
FIXED	.138	.359	.315	.065	.331	1.000

Panel B: 1994

Variable[1]	TYPE	NIM	TPT	FTE	OPERATING	FIXED
TYPE	1.000					
NIM	.421	1.000				
TPT	.731	.715	1.000			
FTE	-.127	-.019	-.084	1.000		
OPERATING	.708	.703	.846	-.097	1.000	
FIXED	.131	.355	.286	.084	.302	1.000

[1] See Table A1 for variable definitions.

spread is likely to have higher expenditures on personnel and travel and other operating expenses than does an institution with a low spread. It also suggests that additional spending on personnel and travel is associated with additional spending on other operating expenses. In addition, NIM, TPT, and OPERATING are moderately or highly positively correlated with TYPE, indicating that higher spreads, total personnel and travel expenditures, and other operating expenditures more often are associated with credit unions than with mutual S&Ls. As with the univariate statistics, however, further testing with the OLS regression approach is necessary to control for other variables that may affect variable relationships.

High correlation among independent and control variables in the same model increases the variances of the correlated variable coefficients. The increased variances

suggest an unstable empirical model of behavior and make the behavioral results difficult to interpret. Therefore, reduced-form models, the OLS regression models with correlated variables systematically removed, are evaluated for changes in signs and stability of coefficients. Results from these reduced-form models are compared with the full model results for stability. No signficant differences exist between the full-form models and reduced-form models.

OLS Regression Results

This section discusses the OLS regression results by hypothesis. Results are assessed for heteroscedasticity. Heteroscedasticity is corrected for in the models using White's estimator (White 1980). This correction produces a new variance matrix with corrected standard errors and uses a Wald test for significance.

Net Interest Margin (H1)

H1 assesses whether credit unions have lower NIMs than do mutual S&Ls. Table 3 provides a summary of the OLS results for H1 by year.[29] TYPE is insignificant for both 1993 and 1994, indicating that no fundamental difference exists between NIM and TYPE in the model. In other words, credit unions do not have a significantly lower NIM than do mutual S&Ls in either year. These results suggest that credit unions are not passing along the tax subsidy to members through a lower interest margin as intended by the government when granting them tax-exempt status, leading to a rejection of H1.

[29] See Appendix B, Table B1, for detailed results.

Table 3: Summary of Net Interest Margin (H1) Results by Year: Full Sample[1]

Variable[2]	1993	1994
Intercept	.0303***	.0156***
TYPE	.0002	.0006
TPT	-.3602	-.2246
OPERATING	-.2737	.4662***
TYPE*TPT	1.0952***	.9504***
TYPE*OPERATING	.8096***	.1043
MORTGAGE	-.0050***	-.0033***
REGDEP	.0033	.0035*
INVEST	-.0568***	-.0538***
RISK	.2510***	.3297**
K	.0370***	.0444***
HHI	.0049***	.0033***
SIZE	-.0005***	-.0001
Adj. R^2	.7814	.8110
Credit Unions	1,717	1,627
Mutual S&Ls	385	372

[1] The figures provided are parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

Both TPT and OPERATING are insignificant in 1993, indicating that high total personnel and travel expenditures and high other operating expenditures are not associated with high NIMs. In 1994, TPT is insignificant and OPERATING is significant at the $p<.01$ level. These results indicate that, in 1994, high other operating expenditures are associated with high NIMs. However, the interaction terms show that for both years NIM increases as TPT increases and that this increase occurs faster for credit unions than for mutual S&Ls. In addition, NIM increases as OPERATING increases faster for credit unions than for mutual S&Ls in 1993 only. This result suggests that high NIMs may be needed to cover high personnel costs per asset dollar and, possibly, other operating expenditures per asset dollar for credit unions. Therefore, some evidence exists that credit unions are using their net interest margin spreads to cover high expenses as a percentage of assets instead of passing along their tax savings to members.

Two of the product mix variables, MORTGAGE and INVEST, are negative and significant in both years at the $p<.01$ level, as expected. The lower the amount an institution has in mortgages and investments, as opposed to consumer loans, the higher the expected NIM because consumer loans generally have higher associated interest rates than do mortgages and investments. REGDEP was expected to be positive because regular deposits are associated with lower interest rates than are longer-term deposits. The sign is in the hypothesized direction for REGDEP, but the coefficient is marginally significant in 1994 and insignificant in 1993.

Both RISK and K have a positive and significant effect on NIM in 1993 and 1994. These results indicate that institutions with risky loans and high capital ratios have high NIMs. Increased risk by some institutions may be reflected in a high spread, or NIM, and these institutions may need high capital to offset the increased risk of their loan portfolio.

Market concentration plays a significant role in the determination of NIMs. HHI is significant and positive at $p<.01$, indicating that monopolistic markets have high NIMs. As hypothesized, monopolistic markets lead to a larger spread between loan and deposit rates than do more competitive markets.

SIZE is significant and negative at the $p<.01$ level for 1993 and insignificant for 1994. Therefore, in 1993, a negative association exists between the size of an institution and its NIM. As total assets increase, NIMs decrease.

Credit unions also are analyzed by federal versus state charter because state charters may not be as strict on common bond requirements as are federal charters. Thus, the different charter types may lead to differences in behavior between the groups. Table 4 presents a summary of results by full sample, federally-chartered credit unions, and state-chartered credit unions.[30] Panel A contains 1993 results, and Panel B contains 1994 results. In 1993 and 1994, TYPE is insignificant for federally-chartered and state-chartered credit unions, indicating that neither charter type passes along their tax savings to members. The interaction terms remain significant and positive in 1993 with the exception of TYPE*OPERATING for state-chartered credit unions, which becomes insignificant. That is, in 1993, federally-chartered credit unions have NIMs that increase

[30] See Appendix B, Tables B2 and B3 for detailed results.

Table 4: Summary of Net Interest Margin Results: Full Sample vs. Federally-Chartered vs. State-Chartered Credit Unions[1]

Panel A: 1993

Variable[2]	Full Sample	Federally-Chartered Credit Unions	State-Chartered Credit Unions
Intercept	+ ***	+ ***	+ **
TYPE	+	-	+
TPT	-	-	+
OPERATING	-	-	+
TYPE*TPT	+ ***	+ ***	+ **
TYPE*OPERATING	+ ***	+ **	+
MORTGAGE	- ***	- ***	-
REGDEP	+	+ ***	-
INVEST	- ***	- ***	- ***
RISK	+ ***	+ ***	+
K	+ ***	+ ***	+ ***
HHI	+ ***	+	+ ***
SIZE	- ***	- ***	+
Adj. R^2	.7814	.8308	.7590
Credit Unions	1,717	1,025	692
Mutual S&Ls	385	364	353

Panel B: 1994

Variable[2]	Full Sample	Federally-Chartered Credit Unions	State-Chartered Credit Unions
Intercept	+ ***	+ ***	+
TYPE	+	-	-
TPT	-	-	+
OPERATING	+ ***	+ ***	+
TYPE*TPT	+ ***	+ ***	+ **
TYPE*OPERATING	+	+	+
MORTGAGE	- ***	-	-
REGDEP	+ *	+ ***	-
INVEST	- ***	- ***	- ***
RISK	+ **	+ *	+
K	+ ***	+ ***	+ ***
HHI	+ ***	- *	+ ***
SIZE	-	- ***	+ *
Adj. R^2	.8110	.8471	.7853
Credit Unions	1,627	995	632
Mutual S&Ls	372	352	339

[1] The + and - represent signs on parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

faster than those of mutual S&Ls as OPERATING increases. Therefore, federally-chartered credit unions are driving the 1993 TYPE*OPERATING results. TYPE*TPT remains significant and positive in 1994. These results indicate that NIM increases as TPT increases faster for credit unions than for mutual S&Ls for both charter types. Thus, with the exception of the 1993 TYPE*OPERATING results, the analysis by charter type does not appear to differ significantly from the full sample results.

Table 5 presents results by membership type.[31] Credit unions can be formed with an associational, occupational, or residential common bond. Analysis by membership type can provide insight into differences that may exist among the common bond types. The TYPE variable provides the most interesting difference in membership type results as compared to the full sample results. In both 1993 and 1994, TYPE is significant and negative at the $p < .01$ level for associational credit unions. This result indicates that associational credit unions may be passing along at least a portion of their tax savings to their members through a lower NIM. Occupational and residential credit unions remain insignificantly different from mutual S&Ls on TYPE. Therefore, even though associational credit unions produce the hypothesized results, overall results are driven by the occupational and residential credit unions samples because occupational credit unions comprise most of the full sample.

TPT remains insignificant for occupational and residential credit unions in both years and for associational credit unions in 1993. However, TPT is positive and significant at the $p<.05$ level for associational credit unions in 1994, indicating that NIM

[31] See Appendix B, Tables B4, B5, and B6 for detailed results.

Table 5: Summary of Net Interest Margin Results: Full Sample vs. Type of Membership Credit Unions[1]

Panel A: 1993

Variable[2]	Full Sample	Associational Credit Unions	Occupational Credit Unions	Residential Credit Unions
Intercept	+ ***	+	+ ***	+
TYPE	+	- ***	+	+
TPT	-	+	-	-
OPERATING	-	+ **	-	+
TYPE*TPT	+ ***	+ ***	+ ***	+ **
TYPE*OPERATING	+ ***	+	+ **	+
MORTGAGE	- ***	+	- **	-
REGDEP	+	+	+	+
INVEST	- ***	- ***	- ***	- ***
RISK	+ ***	+ **	+ **	+ *
K	+ ***	+ ***	+ ***	+ **
HHI	+ ***	+ **	+ ***	+
SIZE	- ***	-	- **	-
Adj. R^2	.7814	.8347	.7727	.7969
Credit Unions	1,717	147	1,447	123
Mutual S&Ls	385	279	381	186

Panel B: 1994

Variable[2]	Full Sample	Associational Credit Unions	Occupational Credit Unions	Residential Credit Unions
Intercept	+ ***	+	+ ***	+
TYPE	+	- ***	+	-
TPT	-	+ **	-	+
OPERATING	+ ***	+ ***	+ ***	+ *
TYPE*TPT	+ ***	+ ***	+ ***	+ **
TYPE*OPERATING	+	+ ***	+	-
MORTGAGE	- ***	+	- ***	-
REGDEP	+ *	+	+ *	+
INVEST	- ***	- ***	- ***	- ***
RISK	+ **	+ **	+	+
K	+ ***	+ ***	+ ***	+ ***
HHI	+ ***	-	+ ***	-
SIZE	-	-	+	-
Adj. R^2	.8110	.8611	.7988	.8274
Credit Unions	1,627	161	1,358	108
Mutual S&Ls	372	269	372	191

[1] The + and - represent signs on parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

increases as TPT increases for this group only. OPERATING is positive and significant for all samples in 1994 but only for associational credit unions in 1993. This result suggests that increases in OPERATING are associated with increases in NIM for all samples in 1994, but only for associational credit unions in 1993. The interaction of TYPE*TPT is positive and significant for all samples in both years. Thus, the results indicate that NIM increases faster for credit unions than for mutual S&Ls as TPT increases. Results for TYPE*OPERATING are mixed, with significance in the full and occupational samples in 1993 and the associational sample only in 1994. Occupational credit unions are driving these results in 1993. Interestingly, although associational credit unions have lower average NIMs than do mutual S&Ls, they also have results indicating that NIM increases faster for them than for mutual S&Ls as TPT increases in both years and that NIM increases faster for them than for mutual S&Ls as OPERATING increases in 1994. Thus, the pass through of tax benefits seems to decrease as the associational credit unions increase their expenditures on personnel and operations.

Total Personnel and Travel Expenditures (H2)

Total personnel and travel expenditures (TPT) is the dependent variable used in H2. This hypothesis tests whether credit unions have higher TPT than do mutual S&Ls, with results summarized in Table 6.[32] TYPE is significant and positive at the $p<.01$ level for both 1993 and 1994. These results support H2 and indicate that credit union management consumes more perquisites through paying higher wages and travel

[32] See Appendix C, Table C1, for detailed results

Table 6: Summary of Total Personnel and Travel Expenditures (H2) Results by Year: Full Sample[1]

Variable[2]	1993	1994
Intercept	.0133***	.0157***
TYPE	.0043***	.0047***
NIM	.1251***	.3196***
OPERATING	.2475***	.0014
TYPE*NIM	.0022	-.1557***
TYPE*OPERATING	.1596*	.3739***
FIXED	.0218***	.0179***
FTE	.0002***	.0002***
MORTGAGE	-.0006	-.0010*
REGDEP	-.0023**	-.0028**
INVEST	.0014*	.0036***
WAGERATE	-.0007	-.0009*
RISK	-.0872*	-.0380
HHI	-.0030***	-.0028***
SIZE	-.0005***	-.0006***
Adj. R^2	.8043	.8011
Credit Unions	1,717	1,627
Mutual S&Ls	385	372

[1] The figures provided are parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

expenditures per asset dollar than does mutual S&L management.

NIM is significant and positive at the $p<.01$ level for both years in this model. High NIMs are associated with high TPT. However, the interaction of TYPE*NIM is insignificant in 1993 and negative and significant at the $p<.01$ level for 1994. This result indicates that for 1994 TPT increases at a slower rate for credit unions than for mutual S&Ls as NIM increases. This outcome is interesting when compared to the TYPE*TPT results in the previous model with NIM as the dependent variable. In this previous model, TYPE*TPT was positive and significant, indicating that NIM increases faster for credit unions than for mutual S&Ls as TPT increases. These two results are reconciled if the slopes of the lines by type are considered. In the NIM model, credit unions have a moderately steep, positive slope (approximately 45°) on the TPT-NIM line, while mutual S&Ls have a slightly positive slope (approximately 10°). When the two axes are rotated for the TPT model, credit unions still have a moderately steep, positive slope (approximately 45°) on the NIM-TPT line, while mutual S&Ls now have a steep, positive slope (approximately 80°).

OPERATING alone explains some of the variation in TPT for 1993, but combining OPERATING with TYPE shows that credit unions have TPT increasing with OPERATING faster than do mutual S&Ls. These results indicate that institutions with high other operating expenditures per asset dollar also have high personnel and travel expenditures per asset dollar and that credit unions exhibit more of this behavior than do mutual S&Ls.

As expected, a significant and positive relationship exists between TPT and the control variables FIXED and FTE. Institutions with high fixed assets and high full-time equivalent employees have high total personnel and travel expenditures per asset dollar.

MORTGAGE is negative and significant at the $p<.10$ level in 1994. Mortgage loans are less expensive for an institution to service than are consumer loans. However, REGDEP also is negative and significant at the $p<.10$ level. This result is opposite of the expected direction because regular deposits usually are more expensive to service than are long-term deposits. In addition, the sign of INVEST is opposite the hypothesized direction. INVEST is significant and positive in both 1993 and 1994, indicating that increases in investments are related to high TPT.

WAGERATE and RISK appear to have little effect on TPT. However, both HHI and SIZE are negative and significant at the $p<.01$ level. Concentrated markets lead to low total personnel and travel expenditures, indicating that managers may be able to engage in perquisite consumption behavior easier in a less concentrated market than in a competitive market. In addition, a negative association exists between total assets and TPT, indicating that TPT increases as total assets decrease.

Table 7 presents a summary of the TPT results delineated by full, federally-chartered, and state-chartered samples.[33] Few differences exist among the sub-samples for the hypotheses variables. TYPE remains positive and significant at the $p<.01$ level for both years. Therefore, no significant differences relating to TPT and H2 appear to exist by charter status.

[33] See Appendix C, Tables C2 and C3 for detailed results.

Table 7: Summary of Total Personnel and Travel Expenditures Results: Full Sample vs. Federally-Chartered vs. State-Chartered Credit Unions[1]

Panel A: 1993

Variable[2]	Full Sample	Federally-Chartered Credit Unions	State-Chartered Credit Unions
Intercept	+ ***	+ ***	+ ***
TYPE	+ ***	+ ***	+ ***
NIM	+ ***	+ ***	+
OPERATING	+ ***	+ ***	+ ***
TYPE*NIM	+	-	+
TYPE*OPERATING	+ *	+	+ *
FIXED	+ ***	+	+ ***
FTE	+ ***	+ **	+ **
MORTGAGE	-	-	-
REGDEP	- **	- ***	+
INVEST	+ *	+ ***	-
WAGERATE	-	-	-
RISK	- *	- *	-
HHI	- ***	- ***	-
SIZE	- ***	- **	- ***
Adj. R^2	.8043	.8326	.8759
Credit Unions	1,717	1,025	692
Mutual S&Ls	385	364	353

Panel B:1994

Variable[2]	Full Sample	Federally-Chartered Credit Unions	State-Chartered Credit Unions
Intercept	+ ***	+ ***	+ ***
TYPE	+ ***	+ ***	+ ***
NIM	+ ***	+ ***	+ ***
OPERATING	+	+	+
TYPE*NIM	- ***	- ***	- **
TYPE*OPERATING	+ ***	+ ***	+ ***
FIXED	+ ***	+	+ ***
FTE	+ ***	+ **	+ ***
MORTGAGE	- *	- **	-
REGDEP	- **	- ***	+
INVEST	+ ***	+ ***	+
WAGERATE	- *	-	-
RISK	-	-	+
HHI	- ***	- **	- ***
SIZE	- ***	- ***	- ***
Adj. R^2	.8011	.8207	.8895
Credit Unions	1,627	995	632
Mutual S&Ls	372	352	339

[1] The + and - represent signs on parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

TYPE*NIM remains unchanged from the full sample results. TYPE*NIM is insignificant in 1993 and negative and significant for both charter types in 1994. In 1994, TPT increases at a slower rate for credit unions than for mutual S&Ls as NIM increases.

TYPE*OPERATING becomes insignificant for the federally-chartered credit union sample in 1993, but remains significant and positive for all samples in 1994. Therefore, the state-chartered credit union samples appear to be driving the positive effects between TYPE*OPERATING and TPT in 1993.

Table 8 presents results for H2 delineated by credit union membership type.[34] TYPE remains significant and positive at the $p<.01$ level for all sub-samples in 1993 and 1994. Credit unions have higher total personnel and travel expenditures per asset dollar than do mutual S&Ls in all break-out samples, lending support to H2.

NIM is positive and significant in all samples with the exception of the 1993 residential credit union sample. Therefore, NIM continues to be positively associated with TPT for all but this 1993 residential credit union sample. The interaction of TYPE*NIM is positive and weakly significant in 1993 for the residential credit union sample only. However, the residential credit union sample is too small to have a significant effect on the full sample results. The interaction is negative and significant for all but the residential credit union sample in 1994. Therefore, results are mixed as to the relation of TPT as NIM increases for credit unions.

TYPE*OPERATING is significant and positive for all samples in 1993 and 1994 with the exception of the 1993 associational credit union sample. With the exception of

[34] See Appendix C, Tables C4, C5, and C6 for detailed results.

Table 8: Summary of Total Personnel and Travel Expenditures Results: Full Sample vs. Type of Membership Credit Unions[1]

Panel A: 1993

Variable[2]	Full Sample	Associational Credit Unions	Occupational Credit Unions	Residential Credit Unions
Intercept	+ ***	+	+ ***	+
TYPE	+ ***	+ ***	+ ***	+ ***
NIM	+ ***	+ **	+ ***	+
OPERATING	+ ***	+ ***	+ ***	+ **
TYPE*NIM	+	+	+	+ *
TYPE*OPERATING	+ *	+	+ *	+ **
FIXED	+ ***	+ **	+ **	+
FTE	+ ***	+	+ ***	+ **
MORTGAGE	-	- *	- *	+
REGDEP	- **	+	-	+
INVEST	+ *	+	+	-
WAGERATE	-	+ *	-	-
RISK	- *	-	-	-
HHI	- ***	- ***	- ***	-
SIZE	- ***	-	- ***	-
Adj. R^2	.8043	.9029	.8252	.9210
Credit Unions	1,717	147	1,447	123
Mutual S&Ls	385	279	381	186

Panel B: 1994

Variable[2]	Full Sample	Associational Credit Unions	Occupational Credit Unions	Residential Credit Unions
Intercept	+ ***	+ *	+ ***	+
TYPE	+ ***	+ ***	+ ***	+ ***
NIM	+ ***	+ ***	+ ***	+ ***
OPERATING	+	+	+	+
TYPE*NIM	- ***	- **	- ***	-
TYPE*OPERATING	+ ***	+ **	+ ***	+ **
FIXED	+ ***	+ **	+	+ **
FTE	+ ***	+	+ ***	+ **
MORTGAGE	- *	- **	- *	+
REGDEP	- **	-	-	+
INVEST	+ ***	+ ***	+ ***	-
WAGERATE	- *	+	-	+
RISK	-	- **	+ **	+ *
HHI	- ***	-	- ***	- ***
SIZE	- ***	- *	- ***	- ***
Adj. R^2	.8011	.8982	.8248	.9469
Credit Unions	1,627	161	1,358	108
Mutual S&Ls	372	269	372	191

[1] The + and - represent signs on parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

the 1993 associational credit union sample, as OPERATING increases, TPT increases faster for credit unions than for mutual S&Ls. Thus, given the results for TYPE and the interactions with TYPE, breaking out the full sample by member type does not provide significant differences from the full sample results for H2.

Other Operating Expenditures (H3)

Table 9 summarizes the results for other operating expenditures (H3).[35] H3 tests whether OPERATING is higher for credit unions than for mutual S&Ls. TYPE is significant in the model at the $p<.10$ level for 1993 and $p<.01$ level for 1994. These results indicate that credit unions spend more on other operating expenditures per asset dollar than do mutual S&Ls, in support of H3.

NIM also is positive and significant in the model for both years. Other operating expenditures per asset dollar increase as the net interest margin of an institution increases. However, the interaction of TYPE*NIM is insignificant in 1993 and marginally significant and negative in 1994, indicating that increases in NIM may be linked with increases in OPERATING at a slower rate for credit unions than for mutual S&Ls in 1994.

TPT and OPERATING have a significant and positive relationship at the $p<.05$ level for 1993 and no significant relationship in 1994, indicating that TPT increases as OPERATING increases in 1993 only. The interaction of TYPE*TPT leads to a positive and significant coefficient at the $p<.01$ level for both 1993 and 1994. This result indicates that other operating expenditures per asset dollar increase at a faster rate for credit unions

[35] See Appendix D, Table D1 for detailed results.

Table 9: Summary of Other Operating Expenditure (H3) Results by Year: Full Sample[1]

Variable[2]	1993	1994
Intercept	.0113***	.0055**
TYPE	.0011*	.0017***
NIM	.1453***	.2328***
TPT	.1563**	.0726
TYPE*NIM	-.0336	-.0781*
TYPE*TPT	.3674***	.3770***
FIXED	.0431***	.0347***
FTE	.0001**	.0001
MORTGAGE	-.0034***	-.0036***
REGDEP	.0018	.0034***
INVEST	.0017*	.0039***
HHI	-.0018*	-.0012*
SIZE	-.0005***	-.0003***
Adj. R^2	.7811	.7768
Credit Unions	1,717	1,627
Mutual S&Ls	385	372

[1] The figures provided are parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

than for mutual S&Ls as total personnel and travel expenditures per asset dollar increase.

FIXED is positive and significant at the $p<.01$ level for 1993 and 1994, while FTE is positive and significant at the $p<.05$ level in 1993 and insignificant in 1994. Increased amounts of total fixed assets and high full-time equivalent employees per asset dollar lead to high operating expenditures per asset dollar in 1993, as expected. Total fixed assets are associated with high operating expenditures, and additional employees require additional resources.

Of the product mix control variables, MORTGAGE is negative and significant at the $p<.01$ level in both years, REGDEP is positive and significant at $p<.01$ for 1994 only, and INVEST is positive and significant in both 1993 and 1994. Mortgages are less expensive to service than consumer loans, and regular deposits are more expensive to service than other deposits, leading to expected results. The sign on INVEST is opposite of the hypothesized direction, indicating that high other operating expenditures are associated with high percentages of investments.

HHI is negative and marginally significant, while SIZE is negative and significant at the $p<.01$ level. These results weakly support that competitive markets have higher other operating expenditures per asset dollar than do monopolistic markets. SIZE is negatively associated with OPERATING, indicating that OPERATING decreases as total assets increase.

Several significant differences exist between the full sample results and the results of federally-chartered and state-chartered credit unions, as indicated in Table 10.[36] The

[36] See Appendix D, Tables D2 and D3 for detailed results.

Table 10: Summary of Other Operating Expenditure Results: Full Sample vs. Federally-Chartered vs. State-Chartered Credit Unions[1]

Panel A: 1993

Variable[2]	Full Sample	Federally-Chartered Credit Unions	State-Chartered Credit Unions
Intercept	+ ***	+ ***	+ ***
TYPE	+ *	+ ***	-
NIM	+ ***	+ ***	+ ***
TPT	+ **	+ ***	+
TYPE*NIM	-	-	-
TYPE*TPT	+ ***	+ ***	+ ***
FIXED	+ ***	+ ***	+ ***
FTE	+ **	+ **	+ **
MORTGAGE	- ***	- ***	- ***
REGDEP	+	+	+
INVEST	+ *	+ **	+
HHI	- *	-	- ***
SIZE	- ***	- ***	- ***
Adj. R^2	.7811	.8130	.8499
Credit Unions	1,717	1,025	692
Mutual S&Ls	385	364	353

Panel B:1994

Variable[2]	Full Sample	Federally-Chartered Credit Unions	State-Chartered Credit Unions
Intercept	+ **	+	+ ***
TYPE	+ ***	+ ***	-
NIM	+ ***	+ ***	+ ***
TPT	+	+	+
TYPE*NIM	- *	-	- **
TYPE*TPT	+ ***	+ ***	+ ***
FIXED	+ ***	+ ***	+
FTE	+	+	+ *
MORTGAGE	- ***	- ***	- ***
REGDEP	+ ***	+ *	+
INVEST	+ ***	+ ***	+
HHI	- *	-	-
SIZE	- ***	- *	- ***
Adj. R^2	.7768	.8062	.8589
Credit Unions	1,627	995	632
Mutual S&Ls	372	352	339

[1] The + and - represent signs on parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

most significant difference exists with TYPE for the state-chartered credit union sample. TYPE becomes insignificant for this sample in both years, indicating that state-chartered credit unions do not have significantly higher operating expenditures than do mutual S&Ls. Therefore, H3 is supported only for federally-chartered credit unions.

NIM remains positive and significant for all samples, indicating a positive association between NIM and OPERATING. TYPE*NIM is negative for all samples, but is only significant for the full sample and state-chartered credit union sample in 1994, indicating that state-chartered credit unions are driving the 1994 result. In 1994, OPERATING increases at a slower rate for state-chartered credit unions than for mutual S&Ls as NIM increases.

TPT remains significant only for federally-chartered credit unions in 1993, while TYPE*TPT is significant and positive for all samples. Therefore, federally-chartered credit unions are driving the 1993 TPT results, as well as the TYPE results for both years, while OPERATING increases at a faster rate for credit unions than for mutual S&Ls as TPT increases for all samples.

Table 11 presents results for H3 delineated by credit union membership type.[37] Type remains significant for all but the residential credit union sample. These results indicate that associational and occupational credit unions incur significantly higher other operating expenditures per asset dollar than do mutual S&Ls, supporting H3. However, no significant difference exists between the operating expenditures of residential credit unions and mutual S&Ls.

[37] See Appendix D, Tables D4, D5, and D6 for detailed results.

Table 11: Summary of Other Operating Expenditure Results: Full Sample vs. Type of Membership Credit Unions[1]

Panel A: 1993

Variable[2]	Full Sample	Associational Credit Unions	Occupational Credit Unions	Residential Credit Unions
Intercept	+ ***	+ **	+ ***	+ ***
TYPE	+ *	+ **	+ *	+
NIM	+ ***	+ **	+ ***	+ ***
TPT	+ **	+ **	+ ***	+
TYPE*NIM	-	+	-	- ***
TYPE*TPT	+ ***	+	+ ***	+ ***
FIXED	+ ***	+ **	+ ***	+ **
FTE	+ **	+ *	+ **	+ ***
MORTGAGE	- ***	- ***	- ***	- **
REGDEP	+	+	+	-
INVEST	+ *	-	+	+ **
HHI	- *	-	- *	-
SIZE	- ***	-	- ***	- ***
Adj. R^2	.7811	.8993	.7949	.9079
Credit Unions	1,717	147	1,447	123
Mutual S&Ls	385	279	381	186

Panel B: 1994

Variable[2]	Full Sample	Associational Credit Unions	Occupational Credit Unions	Residential Credit Unions
Intercept	+ **	+	+ **	+
TYPE	+ ***	+ ***	+ ***	+
NIM	+ ***	+ ***	+ ***	+ ***
TPT	+	+	+	+ *
TYPE*NIM	- *	-	- **	- **
TYPE*TPT	+ ***	+	+ ***	+ ***
FIXED	+ ***	+	+ ***	+ *
FTE	+	+	+	+
MORTGAGE	- ***	- ***	- ***	- **
REGDEP	+ ***	+ *	+	+
INVEST	+ ***	+	+ **	+ **
HHI	- *	-	- *	- *
SIZE	- ***	-	- **	-
Adj. R^2	.7768	.8643	.7974	.9249
Credit Unions	1,627	161	1,358	108
Mutual S&Ls	372	269	372	191

[1] The + and - represent signs on parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

NIM remains significant and positively related to OPERATING for all samples, indicating that high NIMs are associated with high OPERATING for all samples. TYPE*NIM remains either insignificant or negative and significant for the samples. Therefore, as seen above with the 1994 state chartered credit union sample, some evidence exists that as NIM increases, OPERATING increases at a slower rate for credit unions than for mutual S&Ls. This evidence exists for residential credit unions in both years and occupational credit unions in 1994.

Associational and occupational credit unions are driving the significant, positive results on TPT in 1993. In addition, TYPE*TPT is positive and significant for all but the associational credit union samples in both years. This result indicates that for the occupational and residential credit union samples, as TPT increases, OPERATING increases at a faster rate for credit unions than for mutual S&Ls.

Full-Time Equivalent Employees (H4)

H4 tests whether credit unions have higher full-time equivalent employees per asset dollar than do mutual S&Ls. As shown in Table 12, TYPE is positive and significant at the $p<.05$ level.[38] This result indicates that credit unions employ more full-time equivalents per asset dollar than do mutual S&Ls, supporting H4. NIM is positive and significant at the $p<.01$ level in 1994. Therefore, in 1994, high NIMs are associated with high FTEs.

MORTGAGE and INVEST are negative and significant in 1993 and

[38] See Appendix E, Table E1 for detailed results.

Table 12: Summary of Full-Time Equivalent Employee (H4) Results by Year: Full Sample[1]

Variable[2]	1993	1994
Intercept	-42.0187***	-41.6344***
TYPE	13.9011**	14.3079**
NIM	5.6601	15.1082***
MORTGAGE	-1.3150***	-1.1206***
REGDEP	.8035*	.8171**
INVEST	-1.7187***	-.5781
WAGERATE	-.1918	-.1670
HHI	.0889	.1043
SIZE	2.5126***	2.4469***
TYPE*SIZE	-.7429**	-.7742**
Adj. R^2	.5587	.5720
Credit Unions	1,717	1,627
Mutual S&Ls	385	372

[1] The figures provided are parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

MORTGAGE remains significant in 1994. Mortgages and investments require fewer employees than do consumer loans, leading to the hypothesized results. REGDEP is positive and significant for both years, indicating that, as expected, regular deposits require more employees per asset dollar than do other deposits.

SIZE is significant and positive, which indicates that FTE increases with size. However, the TYPE*SIZE interaction term is negative and significant at the $p<.05$ level. As SIZE increases, FTE increases at a slower rate for credit unions than for mutual S&Ls. Therefore, although credit unions have higher average FTEs than mutual S&Ls, and FTEs increase for all institutions as SIZE increases, the results suggest that mutual S&Ls engage in more of this agency behavior as total assets increase than do credit unions.

The breakout of credit unions by charter status is compared to the full sample in Table 13.[39] TYPE remains significant and positive for both. Therefore, H4 results are supported by both charter types. No significant differences exist between the full sample and the charter type results.

Table 14 presents results for the sub-samples of credit unions by membership type.[40] TYPE is positive and significant for all groups, indicating that the three membership types for credit unions all employ more FTEs than do mutual S&Ls. In addition, SIZE and TYPE*SIZE remain significantly positive and significantly negative, respectively. Therefore, the larger the institution, whether credit union or mutual S&L,

[39] See Appendix E, Tables E2 and E3 for detailed results.
[40] See Appendix E, Tables E4, E5, and E6 for detailed results.

Table 13: Summary of Full-Time Equivalent Employee Results: Full Sample vs. Federally-Chartered vs. State-Chartered Credit Unions[1]

Panel A: 1993

Variable[2]	Full Sample	Federally-Chartered Credit Unions	State-Chartered Credit Unions
Intercept	- ***	- ***	- ***
TYPE	+ **	+ *	+ **
NIM	+	+	-
MORTGAGE	- ***	- ***	- ***
REGDEP	+ *	+	+ ***
INVEST	- ***	- *	- ***
WAGERATE	-	+	-
HHI	-	+	-
SIZE	+ ***	+ ***	+ ***
TYPE*SIZE	- **	- *	- **
Adj. R^2	.5587	.5385	.5314
Credit Unions	1,717	1,025	692
Mutual S&Ls	385	364	353

Panel B: 1994

Variable[2]	Full Sample	Federally-Chartered Credit Unions	State-Chartered Credit Unions
Intercept	- ***	- ***	- ***
TYPE	+ **	+ **	+ **
NIM	+ ***	+ ***	+ **
MORTGAGE	- ***	- ***	- **
REGDEP	+ **	+	+ ***
INVEST	-	-	- **
WAGERATE	-	+	-
HHI	+	-	+
SIZE	+ ***	+ ***	+ ***
TYPE*SIZE	- **	- **	- **
Adj. R^2	.5720	.5549	.5616
Credit Unions	1,627	995	632
Mutual S&Ls	372	352	339

[1] The + and - represent signs on parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

Table 14: Summary of Full-Time Equivalent Employee Results: Full Sample vs. Type of Membership Credit Unions[1]

Panel A: 1993

Variable[2]	Full Sample	Associational Credit Unions	Occupational Credit Unions	Residential Credit Unions
Intercept	- ***	- ***	- ***	- ***
TYPE	+ **	+ **	+ **	+ ***
NIM	+	+	+	-
MORTGAGE	- ***	- *	- ***	- **
REGDEP	+ *	+ **	+	+ **
INVEST	- ***	- *	- ***	- ***
WAGERATE	-	+ *	-	+
HHI	-	+	+	+
SIZE	+ ***	+ ***	+ ***	+ ***
TYPE*SIZE	- **	- **	- **	- ***
Adj. R^2	.5587	.4327	.5483	.6132
Credit Unions	1,717	147	1,447	123
Mutual S&Ls	385	279	381	186

Panel B: 1994

Variable[2]	Full Sample	Associational Credit Unions	Occupational Credit Unions	Residential Credit Unions
Intercept	- ***	- ***	- ***	- ***
TYPE	+ **	+ ***	+ **	+ ***
NIM	+ ***	+ **	+ ***	+
MORTGAGE	- ***	-	- ***	- **
REGDEP	+ **	+ **	+	+ ***
INVEST	-	+	- *	-
WAGERATE	-	+	-	-
HHI	+	+	+	+
SIZE	+ ***	+ ***	+ ***	+ ***
TYPE*SIZE	- **	- ***	- **	- ***
Adj. R^2	.5720	.5175	.5663	.5503
Credit Unions	1,627	161	1,358	108
Mutual S&Ls	372	269	372	191

[1] The + and - represent signs on parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

the higher the number of FTEs. However, as SIZE increases, credit unions increase their number of FTEs at a slower rate than do mutual S&Ls.

Total Fixed Assets (H5)

For fixed asset differences between credit unions and mutual S&Ls, the results indicate that the type of institution is not a strong determining factor. In Table 15, TYPE is insignificant for 1993 and only marginally significant and negative in 1994, which lends to no support for H5.[41] K and TYPE*SIZE are the only two significant variables in the model. K is negative and significant at the $p<.05$ level in 1993, indicating that capital ratios are higher for institutions with fewer fixed assets in 1993.
TYPE*SIZE is marginally significant and positive at the $p<.10$ level in 1993 and significant at the $p<.01$ level in 1994, indicating that fixed assets per asset dollar increase at a faster rate for credit unions than for mutual S&Ls as SIZE increases, lending some support to H5 as SIZE increases.

Several differences exist when credit unions are delineated by charter status. In Table 16, TYPE is negative and significant at the $p<.05$ level for federally-chartered credit unions in 1994, indicating that these credit unions have lower fixed assets than do mutual S&Ls and are driving the 1994 results.[42] K remains negative and marginally significant in 1993 and is significant at the $p<.01$ level for the federally-chartered credit union sample in 1994. Therefore, low capital levels are associated with high total fixed assets for

[41] See Appendix F, Table F1 for detailed results.
[42] See Appendix F, Tables F2 and F3 for detailed results.

Table 15: Summary of Total Fixed Asset (H5) Results by Year: Full Sample[1]

Variable[2]	1993	1994
Intercept	.0109	.0127*
TYPE	-.0080	-.0158*
K	-.0235**	-.0162
HHI	.0037	-.0008
SIZE	.0001	.0001
TYPE*SIZE	.0008*	.0012***
Adj. R^2	.0248	.0253
Credit Unions	1,717	1,627
Mutual S&Ls	385	372

[1] The figures provided are parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.
[2] See Table A1 for variable definitions.

Table 16: Summary of Total Fixed Asset Results: Full Sample vs. Federally-Chartered vs. State-Chartered Credit Unions[1]

Panel A: 1993

Variable[2]	Full Sample	Federally-Chartered Credit Unions	State-Chartered Credit Unions
Intercept	+	+	+
TYPE	-	-	-
K	- **	- **	- *
HHI	+	+ ***	-
SIZE	+	+	+
TYPE*SIZE	+ *	+ **	+
Adj. R^2	.0248	.0268	.0721
Credit Unions	1,717	1,025	692
Mutual S&Ls	385	364	353

Panel B: 1994

Variable[2]	Full Sample	Federally-Chartered Credit Unions	State-Chartered Credit Unions
Intercept	+ *	+ **	+
TYPE	- *	- **	-
K	-	- ***	-
HHI	-	+	- *
SIZE	+	-	+
TYPE*SIZE	+ ***	+ ***	+
Adj. R^2	.0253	.0311	.0686
Credit Unions	1,627	995	632
Mutual S&Ls	372	352	339

[1] The + and - represent signs on parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.
[2] See Table A1 for variable definitions.

federally-chartered credit unions in both years and state-chartered credit unions in 1993. TYPE*SIZE is positive and significant at the $p<.05$ level in 1993 and the $p<.01$ level in 1994 for federally-chartered credit unions, indicating that, as size increases, fixed assets per asset dollar of federally-chartered credit unions increase at a faster rate than those of mutual S&Ls. Therefore, federally-chartered credit unions are driving the TYPE*SIZE results in both years and the TYPE results in 1994.

Table 17 presents results for the sample delineated by credit union membership type.[43] TYPE remains insignificant in 1993. The residential credit union sample, with TYPE negative and significant at the $p<.01$ level, is driving the TYPE results for 1994. For this sample, credit unions have lower total fixed assets per asset dollar than do mutual S&Ls. While SIZE remains insignificant for all but the 1994 residential credit unions, TYPE*SIZE remains positive and significant for all but the 1993 residential credit unions. Therefore, while the results on TYPE provide no support for H5, results on TYPE*SIZE indicate that for all but the 1993 residential credit union sample, FIXED increases at a faster rate for credit unions than for mutual S&Ls as SIZE increases. This result provides some support for the hypothesis that credit unions have higher fixed assets per asset dollar than do mutual S&Ls as size increases.

[43] See Appendix F, Tables F4, F5, and F6 for detailed results.

Table 17: Summary of Total Fixed Asset Results: Full Sample vs. Type of Membership Credit Unions[1]

Panel A: 1993

Variable[2]	Full Sample	Associational Credit Unions	Occupational Credit Unions	Residential Credit Unions
Intercept	+	+ ***	+	+ **
TYPE	-	-	-	-
K	- **	- ***	- *	-
HHI	+	+	+ **	-
SIZE	+	-	+	-
TYPE*SIZE	+ *	+ *	+ *	+
Adj. R^2	.0248	.0648	.0287	.2058
Credit Unions	1,717	147	1,447	123
Mutual S&Ls	385	279	381	186

Panel B: 1994

Variable[2]	Full Sample	Associational Credit Unions	Occupational Credit Unions	Residential Credit Unions
Intercept	+ *	+ ***	+	+ ***
TYPE	- *	-	-	- ***
K	-	- ***	-	- **
HHI	-	+	-	-
SIZE	+	-	+	- **
TYPE*SIZE	+ ***	+ ***	+ *	+ ***
Adj. R^2	.0253	.0754	.0221	.2073
Credit Unions	1,627	161	1,358	108
Mutual S&Ls	372	269	372	191

[1] The + and - represent signs on parameter coefficients. ***, **, and * indicate significance at the .01, .05, and .10 level, respectively.

[2] See Table A1 for variable definitions.

Empirical Analysis Summary

This section summarizes the results in the previous section and Table 18 provides an overview of both univariate and multivariate OLS regression results by hypothesis. While the univariate analyses provide an overview of fundamental differences in variables by type of institution, OLS regression analyses primarily test the hypotheses. OLS regressions include independent and control variables needed for a thorough evaluation of the hypotheses.

H1 states that, if credit unions are complying with the government objective of passing along the tax savings to members, net interest margins of credit unions should be lower than net interest margins of mutual S&Ls. The univariate results indicate that, instead of a lower average net interest margin, credit unions have a significantly higher average net interest margin than do mutual S&Ls. However, the OLS regressions indicate that credit unions have an average net interest margin that is not significantly different from the net interest margin of mutual S&Ls, with the exception of associational credit unions, after controlling for operating expenditures, product mix, risk, capital, operating environment competitiveness, and size variables. This result leads to a rejection of H1 in all but associational credit unions. On average, occupational and residential credit unions are not passing along a significant portion of their tax subsidy to members through net interest margins.

The results further imply that credit unions may be using their net interest margin to cover higher expenses per asset dollar than do mutual S&Ls. All sample results

Table 18: Summary of Hypotheses Results

	Hypothesis	Univariate Results	Model Results
H1	The net interest margin of credit unions is lower than the net interest margin of mutual S&Ls	**Reject** - NIM is not significantly lower for credit unions than for mutual S&Ls	**Reject** - NIM is not significantly lower for credit unions than for mutual S&Ls
H2	Credit unions have higher total personnel and travel expenditures costs as a percentage of total assets than do mutual S&Ls	**Accept** - TPT is significantly higher for credit unions than for mutual S&Ls	**Accept** - TPT is significantly higher for credit unions than for mutual S&Ls
H3	Credit unions have higher other operating expenditures as a percentage of total assets than do mutual S&Ls	**Accept** - OPERATING is significantly higher for credit unions than for mutual S&Ls	**Accept** - OPERATING is significantly higher for credit unions than for mutual S&Ls
H4	Credit unions have higher full-time equivalent employees as a percentage of total assets than do mutual S&Ls	**Reject** - FTE is not significantly higher for credit unions than for mutual S&Ls	**Accept** - FTE is significantly higher, on average, for credit unions than for mutual S&Ls.
H5	Credit unions have higher total fixed assets as a percentage of total assets than do mutual S&Ls	**Accept** - FIXED is significantly higher for credit unions than for mutual S&Ls	**Reject** - FIXED is not significantly higher, on average, for credit unions than for mutual S&Ls.

indicate that net interest margin increases as total personnel and travel expenditures increase faster for credit unions than for mutual S&Ls. In the 1993 full sample, federally-chartered credit union sample, and occupational credit union sample, net interest margin increases as other operating expenditures increase faster for credit unions than for mutual S&Ls. This result, however, holds only for the 1994 associational credit unions. Therefore, strong evidence exists that credit unions do not have lower net interest margins than do mutual S&Ls and that net interest margins increase as total personnel and travel expenditures increase faster for credit unions than for mutual S&Ls. Therefore, credit unions not only are failing to pass along their tax subsidy to members, but also are deviating further from the governments' objective than are mutual S&Ls as net interest margins and total personnel and travel expenditures rise.

H2 through H5 test the agency theory that, if credit unions are more protected than mutual S&Ls from owner interference and corporate takeovers, managers may consume perquisites through higher expenditures per asset dollar. H2 tests consumption of perquisites through total personnel and travel expenditures. All univariate results and OLS regression model results indicate that credit unions have higher total personnel and travel expenditures than do mutual S&Ls, leading to acceptance of H2. Results for 1993 also indicate no difference in the rate that total personnel and travel expenditures increase for credit unions versus mutual S&Ls as net interest margins increase. The 1994 results indicate that for all samples except residential credit unions, total personnel and travel expenditures increase at a slower rate for credit unions as net interest margins increase. In

addition, total personnel and travel expenditures increase faster for credit unions than for mutual S&Ls as other operating expenditures increase for all samples except the 1993 federally-chartered and associational credit union samples. Therefore, credit unions do consume more total personnel and travel expenditures per asset dollar than do mutual S&Ls. However, results are mixed as to whether the credit union rate of total personnel and travel expenditure increases with net interest margins and other operating expenditures as compared to mutual S&Ls.

Consumption of other operating expenditures is examined in H3. Univariate and OLS regression model results indicate that credit unions are consuming more other operating expenditures per asset dollar than are mutual S&Ls. These results hold for all samples except the state-chartered credit unions and residential credit unions. In addition, in 1994 the results weakly indicate that other operating expenditures increase at a slower rate for credit unions than for mutual S&Ls as net interest margins increase. However, other operating expenditures and total personnel and travel expenditures appear to move together at a faster rate for credit unions than for mutual S&Ls for all but the associational credit union samples.

H4 tests consumption of perquisites through the hiring of additional personnel per asset dollar. Interestingly, the univariate results indicate that credit unions have lower full-time equivalent employees, while the OLS regression results indicate that credit unions have higher full-time equivalent employees than do mutual S&Ls in all samples. However, full-time equivalent employees increase at a slower rate for credit unions than for mutual

S&Ls as size increases. Therefore, credit unions do, on average, employ more full-time equivalent employees per asset dollar than do mutual S&Ls, but they do so at a slower rate than that of mutual S&Ls as they increase in size.

Total fixed asset expenditures per asset dollar are examined in H5. Univariate results indicate that credit unions have higher fixed assets per asset dollar than do mutual S&Ls. However, OLS regression results indicate that type of institution, on average, is insignificant in 1993 and marginally significant and negative in the 1994 full sample. The interaction of institutional type and size indicates that total fixed assets increase as size increases faster for credit unions than for mutual S&Ls in all but the state-chartered credit unions samples and the 1993 residential credit union sample. Therefore, while weak evidence exists that credit unions have lower fixed assets per asset dollar, on average, than do mutual S&Ls, evidence also exists that fixed assets per asset dollar increase at a faster rate for credit unions than for mutual S&Ls as size increases. This evidence indicates that results for H5 are mixed. H5 is rejected on average, however, it is accepted as size increases.

CHAPTER 5

CONTRIBUTIONS, LIMITATIONS, AND FUTURE RESEARCH

Contributions of the Research

Tax policy makers and advisors are interested in the impact of tax laws on the affected parties. The government originally allowed tax exemption of credit unions in exchange for lower loan rates and higher deposit rates to members. If credit unions are not complying with the original government objectives, the tax subsidy must be accruing to a group other than the members. This study contributes to extant literature by examining net interest margins of credit unions and mutual S&Ls to ascertain compliance with the original government objectives and finds that net interest margins are not significantly different for credit unions versus mutual S&Ls. This finding suggests that most credit unions are not passing along their tax subsidy to members through lower loan rates, higher deposit rates, or some combination of lower loan rates and higher deposit rates.

Little research has been done on credit unions. Most of the credit union research to date is surveyed by Overstreet and Rubin (1991). The theoretical and empirical research has concentrated on credit union objective functions, production, sponsorship, elasticity, regulation, and growth. Overstreet and Rubin, however, find no research that compares credit unions to any other organizational form. The authors conclude that one area for future research is the application of agency theory to study potential conflicts

between credit union members, management, and the board of directors. In addition, Overstreet and Rubin note a need to compare credit unions to other organizations. This dissertation is the first study adding to the extant literature by comparing credit unions to other institutions having the same ownership structure and customer base as credit unions: mutual S&Ls. Potential agency costs are examined. Results suggest that credit unions have higher total personnel and travel expenditures per asset dollar, higher other operating expenditures per asset dollar, and higher full-time equivalent employees per asset dollar than do mutual S&Ls. Total fixed asset costs per asset dollar also are examined but no significant differences are found, on average, between credit unions and mutual S&Ls for this agency cost variable. However, credit unions do have total fixed assets per asset dollar increasing at a faster rate than do mutual S&Ls as total assets increase.

Limitations of the Research

The current study is limited by the data sources available. Data are not available to examine rates for individual categories of loans and deposits. To control for this limitation, NIMs are examined, and product mixes are controlled for when possible.

Generalizability also is limited in the current study. The results may not be generalizable to the population because only credit unions and mutual S&Ls in an MSA are used. However, the focus of the study is a comparison of credit unions with similar taxable financial institutions, and the results provide insight into the practices of credit union management. In addition, agency theory suggests that results will be stronger in

areas where little or no competition exists for credit unions. Areas outside an MSA are likely areas with lower levels of competition than MSAs.

In addition, only a subset of credit unions are examined. One criteria for deletion from the total population is sponsorship received by credit union. Deletion of these sponsored credit unions further limits generalizability to credit unions not receiving sponsorship. The potential effect of sponsorship is unknown. Sponsorship can further protect management by reducing the expenses that the net interest margin must cover and lead to increased agency problems for expenditures for which management are directly responsible. Alternatively, the sponsoring entity may act as a large shareholder and closely monitor the practices of management.

Future Research

Potential future research areas are numerous because little research is available on credit unions and the practices of their management. Several subsets of credit unions are not included in this study, and research into these subsets can provide additional insight into credit union management behavior and tax subsidy allocations. For example, the study excludes credit unions with no mortgages, credit unions receiving sponsorship, and credit unions not in an MSA. Tax subsidy allocations and agency cost behavior may vary based on the subset examined.

This study is the first research to compare credit unions to another institutional type. The data analysis in this study uses OLS regressions. An area for future research is

to look at the data with different modeling techniques to determine whether other techniques yield similar results. One such modeling technique is simultaneous equations. Net interest margins, total personnel and travel expenditures, and other operating expenditures are examined in separate models in this study. However, decisions on these variables may be made annually and simultaneously. A simultaneous equations model assesses the impact of these variables under the assumption that the variables are jointly determined by management.

Studies researching efficiency of institutions have found differences in efficiency based on mutual versus stock ownership. An area for future research includes examining credit union efficiency by federal versus state charter status and associational versus occupational versus residential member types.

Research into the behavior of a tax-exempt industry can provide researchers with information on how tax subsidies are used. A protected group such as credit unions, operating in a traditionally taxable industry, allows for the research into potential agency costs associated with tax exemption. Additional research into this area is needed to enable tax policy makers to make informed decisions when granting and continuing tax-exempt status.

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APPENDICES

APPENDIX A:

DESCRIPTIVE TABLES

AND

UNIVARIATE RESULTS

Table A1: Description of Variables

Variable	Definition
NIM	(Total loan interest revenue - Total deposit interest expense) / Average earning assets
TPT	(Total personnel wages and benefits + travel expenditures) / Total assets
OPERATING	(Total operating expenditures excluding personnel wages and benefits, travel expenditures, and deposit expenses) / Total assets
FTE	Full-time equivalent employees / Ln (total assets)
FIXED	Total fixed assets / Total assets
TYPE	0 if a mutual S&L, 1 if a credit union
MORTGAGE	Total mortgages / Total loans
REGDEP	Regular checking & savings deposits / Total deposits
INVEST	Total investments / Total assets
RISK	Total loan charge-offs / Total loans
K	Total equity / Total assets
WAGERATE	Hourly manufacturing wage rate in an MSA
HHI	Herfindahl-Hirschman Index for an MSA
SIZE	Ln (total assets)

Table A2: 1993 Univariate Results

Panel A: Credit Unions (TYPE = 1, n = 1717)

Variable[1]	Mean	Maximum	Median	Minimum	Standard Deviation
NIM	.027	.083	.028	-.034	.016
TPT	.017	.044	.017	.001	.006
FTE	1.546	30.590	.719	.059	2.433
OPERATING	.017	.057	.017	.001	.006
FIXED	.017	.131	.013	.001	.015
MORTGAGE	.293	.972	.275	.001	.174
REGDEP	.877	1.000	.882	.379	.077
INVEST	.392	.946	.391	.011	.154
RISK	.001	.044	.000	-.007	.002
K	.090	.353	.086	.008	.032
WAGERATE	2.543	2.868	2.566	2.209	.145
HHI	.148	.709	.123	.026	.115
SIZE	17.158	21.300	17.000	15.600	1.101

Panel B: Mutual S&Ls (TYPE = 0, n = 385)

Variable[1]	Mean	Maximum	Median	Minimum	Standard Deviation
NIM	.009	.018	.009	-.015	.002
TPT	.003	.009	.003	.001	.001
FTE	2.749	30.255	1.452	.118	4.108
OPERATING	.003	.013	.003	.001	.001
FIXED	.008	.073	.010	0.001	.008
MORTGAGE	.946	.991	.970	.519	.068
REGDEP	.900	1.000	.903	.518	.057
INVEST	.229	.744	.203	.014	.127
RISK	.001	.011	0.000	-.006	.001
K	.096	.271	.090	.028	.032
WAGERATE	2.550	2.868	2.578	2.209	.123
HHI	.128	.709	.104	.026	.099
SIZE	18.360	22.200	18.300	15.700	1.091

[1] See Table A1 for variable definitions.

Table A3: 1994 Univariate Results

Panel A: Credit Unions (TYPE = 1, n = 1627)

Variable[1]	Mean	Maximum	Median	Minimum	Standard Deviation
NIM	.026	.082	.027	-.040	.016
TPT	.017	.037	.017	.001	.006
FTE	1.486	32.477	.663	.063	2.363
OPERATING	.017	.044	.017	.001	.006
FIXED	.017	.126	.014	.001	.015
MORTGAGE	.279	.978	.259	.001	.178
REGDEP	.885	1.000	.889	.404	.077
INVEST	.342	.915	.335	.013	.160
RISK	.001	.036	.000	-.005	.002
K	.097	.361	.092	.019	.034
WAGERATE	2.587	2.912	2.607	2.258	.146
HHI	.212	.733	.190	.041	.129
SIZE	17.106	21.400	16.900	15.500	1.124

Panel B: Mutual S&Ls (TYPE = 0, n =372)

Variable[1]	Mean	Maximum	Median	Minimum	Standard Deviation
NIM	.009	.024	.009	-.002	.002
TPT	.003	.010	.003	.001	.001
FTE	2.357	43.009	1.322	.116	3.684
OPERATING	.003	.033	.003	.001	.002
FIXED	.012	.069	.010	.001	.009
MORTGAGE	.944	.998	.973	.605	.072
REGDEP	.900	1.000	.904	.508	.057
INVEST	.199	.821	.176	.015	.129
RISK	.001	.019	0.000	-.006	.002
K	.104	.283	.098	.023	.035
WAGERATE	2.592	2.912	2.614	2.258	.122
HHI	.188	.733	.157	.041	.128
SIZE	18.269	22.100	18.300	15.500	1.071

[1] See Table A1 for variable definitions.

Table A4: Univariate t-statistics

Panel A: 1993

Variable[1]	Mutual S&L Mean	Credit Union Mean	t-Statistic	p-value
NIM	.009	.027	-44.265	.001
TPT	.003	.017	-95.885	.001
FTE	2.749	1.546	5.534	.001
OPERATING	.003	.017	-89.381	.001
FIXED	.008	.017	-9.140	.001
MORTGAGE	.946	.293	120.152	.001
REGDEP	.900	.877	6.697	.001
INVEST	.229	.392	-21.907	.001
RISK	.001	.001	-.083	.934
K	.096	.090	3.085	.002
WAGERATE	2.550	2.543	.990	.323
HHI	.128	.148	-3.513	.001
SIZE	18.360	17.158	19.388	.001
N	385	1717		

Panel B: 1994

Variable[1]	Mutual S&L Mean	Credit Union Mean	t-Statistic	p-value
NIM	.009	.026	-41.994	.001
TPT	.003	.017	-92.886	.001
FTE	2.357	1.486	4.363	.001
OPERATING	.003	.017	-79.599	.001
FIXED	.012	.017	-8.071	.001
MORTGAGE	.944	.279	115.555	.001
REGDEP	.900	.885	4.285	.001
INVEST	.199	.342	-18.359	.001
RISK	.001	.001	1.223	.222
K	.104	.097	3.507	.001
WAGERATE	2.592	2.587	.594	.553
HHI	.188	.212	-3.189	.002
SIZE	18.269	17.106	18.150	.001
N	372	1627		

[1] See Table A1 for variable definitions.

Table A5: Pearson Correlation Coefficients

Panel A: 1993 (n = 2,102)

Variable[1]	TYPE	NIM	TPT	FTE	OPERATING	FIXED	MORTGAGE
TYPE	1.000						
NIM	.431	1.000					
TPT	.728	.717	1.000				
FTE	-.163	-.057	-.109	1.000			
OPERATING	.699	.702	.856	-.135	1.000		
FIXED	.138	.359	.315	.065	.331	1.000	
MORTGAGE	-.845	-.431	-.688	.199	-.689	-.119	1.000
REGDEP	-.120	-.023	-.073	-.050	-.036	.026	.047
INVEST	.389	-.460	.001	-.171	.002	-.234	-.353
RISK	.001	-.015	-.029	.034	-.013	.001	.054
K	-.067	.132	-.192	-.102	-.219	-.065	.063
WAGERATE	-.019	-.021	-.001	-.037	.027	.060	.014
HHI	.070	.096	.021	-.019	.032	.033	-.099
SIZE	-.390	-.281	-.394	.715	-.413	.005	.468

Variable	REGDEP	INVEST	RISK	K	WAGERATE	HHI	SIZE
REGDEP	1.000						
INVEST	-.029	1.000					
RISK	-.029	.042	1.000				
K	.018	.138	.021	1.000			
WAGERATE	.037	.013	-.034	-.015	1.000		
HHI	-.014	-.037	-.011	.059	-.211	1.000	
SIZE	-.069	-.159	.040	-.043	-.025	-.057	1.000

Table A5 (continued)

Panel B: 1994 (n = 1,999)

Variable[1]	TYPE	NIM	TPT	FTE	OPERATING	FIXED	MORTGAGE
TYPE	1.000						
NIM	.421	1.000					
TPT	.731	.715	1.000				
FTE	-.127	-.019	-.084	1.000			
OPERATING	.708	.703	.846	-.097	1.000		
FIXED	.131	.355	.286	.084	.302	1.000	
MORTGAGE	-.846	-.439	-.707	.150	-.707	-.126	1.000
REGDEP	-.080	.015	-.032	-.062	.014	.044	.021
INVEST	.339	-.515	-.025	-.134	-.024	-.254	-.286
RISK	-.026	.012	-.007	.023	.001	-.033	.066
K	-.078	-.120	-.185	-.128	-.204	-.059	.065
WAGERATE	-.012	.011	-.007	-.028	.038	.067	.014
HHI	.071	.066	.007	-.025	.023	-.005	-.084
SIZE	-.376	-.253	-.383	.717	-.382	.033	.439

Variable	REGDEP	INVEST	RISK	K	WAGERATE	HHI	SIZE
REGDEP	1.000						
INVEST	-.035	1.000					
RISK	.010	.023	1.000				
K	-.023	.147	.005	1.000			
WAGERATE	.056	-.023	-.073	-.016	1.000		
HHI	-.034	-.018	-.052	.084	.040	1.000	
SIZE	-.093	-.129	.005	-.083	-.018	-.063	1.000

[1] See Table A1 for variable definitions.

APPENDIX B:

NET INTEREST MARGIN RESULTS (H1)

Table B1: NIM: Full Sample

$$NIM = \beta_0 + \beta_1 (TYPE) + \beta_2 (TPT) + \beta_3 (OPERATING) + \beta_4 (TYPE*TPT) + \beta_5 (TYPE*OPERATING) + \beta_6 (MORTGAGE) + \beta_7 (REGDEP) + \beta_8 (INVEST) + \beta_9 (RISK) + \beta_{10} (K) + \beta_{11} (HHI) + \beta_{12} (SIZE) + \varepsilon$$

Panel A: 1993 (1,717 Credit unions, 385 Mutual S&Ls) Adj. $R^2 = .7814$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0303	.0042	7.151	.001
TYPE	.0002	.0015	.162	.871
TPT	-.3602	.3758	-.959	.338
OPERATING	-.2737	.3028	-.904	.366
TYPE*TPT	1.0952	.3784	2.894	.004
TYPE*OPERATING	.8096	.3039	2.664	.008
MORTGAGE	-.0050	.0012	-4.236	.001
REGDEP	.0033	.0023	1.430	.153
INVEST	-.0568	.0016	-36.290	.001
RISK	.2510	.0740	3.394	.001
K	.0370	.0055	6.695	.001
HHI	.0049	.0014	3.426	.001
SIZE	-.0005	.0002	-2.884	.004

Panel B: 1994 (1,627 Credit Unions, 372 Mutual S&Ls) Adj. $R^2 = .8110$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0156	.0039	4.002	.001
TYPE	.0006	.0014	.439	.661
TPT	-.2246	.2830	-.794	.427
OPERATING	.4662	.1506	3.096	.002
TYPE*TPT	.9504	.2867	3.315	.001
TYPE*OPERATING	.1043	.1573	.663	.507
MORTGAGE	-.0033	.0010	-3.239	.001
REGDEP	.0035	.0021	1.700	.089
INVEST	-.0538	.0014	-39.109	.001
RISK	.3297	.1614	2.043	.041
K	.0444	.0052	8.530	.001
HHI	.0033	.0012	2.840	.005
SIZE	-.0001	.0002	-.581	.561

[1] See Table A1 for variable definitions.

Table B2: NIM: Federally-Chartered Credit Unions

$$NIM = \beta_0 + \beta_1 (TYPE) + \beta_2 (TPT) + \beta_3 (OPERATING) + \beta_4 (TYPE*TPT) + \beta_5 (TYPE*OPERATING) + \beta_6 (MORTGAGE) + \beta_7 (REGDEP) + \beta_8 (INVEST) + \beta_9 (RISK) + \beta_{10} (K) + \beta_{11} (HHI) + \beta_{12} (SIZE) + \varepsilon$$

Panel A: 1993 (1,025 Credit Unions, 364 Mutual S&Ls) Adj. R^2 = .8308

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0333	.0043	7.797	.001
TYPE	-.0019	.0015	-1.221	.222
TPT	-.4711	.3611	-1.305	.192
OPERATING	-.1622	.2946	-.551	.582
TYPE*TPT	1.2096	.3644	3.319	.001
TYPE*OPERATING	.6942	.2978	2.331	.020
MORTGAGE	-.0045	.0012	-3.776	.001
REGDEP	.0070	.0024	2.848	.004
INVEST	-.0536	.0017	-31.628	.001
RISK	.2399	.0610	3.936	.001
K	.0373	.0055	6.806	.001
HHI	.0020	.0015	1.287	.198
SIZE	-.0009	.0002	-5.433	.001

Panel B: 1994 (995 Credit Unions, 352 Mutual S&Ls) Adj. R^2 = .8471

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0191	.0038	4.998	.001
TYPE	-.0008	.0015	-.566	.572
TPT	-.3005	.2688	-1.118	.264
OPERATING	.4829	.1301	3.711	.001
TYPE*TPT	1.0171	.2735	3.718	.001
TYPE*OPERATING	.1258	.1424	.884	.377
MORTGAGE	-.0015	.0010	-1.449	.147
REGDEP	.0061	.0021	2.841	.004
INVEST	-.0510	.0016	-31.902	.000
RISK	.3411	.1681	2.028	.043
K	.0477	.0052	9.192	.001
HHI	-.0020	.0012	-1.710	.087
SIZE	-.0005	.0001	-3.291	.001

[1] See Table A1 for variable definitions.

Table B3: NIM: State-Chartered Credit Unions

$$NIM = \beta_0 + \beta_1 (TYPE) + \beta_2 (TPT) + \beta_3 (OPERATING) + \beta_4 (TYPE*TPT) + \beta_5 (TYPE*OPERATING) + \beta_6 (MORTGAGE) + \beta_7 (REGDEP) + \beta_8 (INVEST) + \beta_9 (RISK) + \beta_{10} (K) + \beta_{11} (HHI) + \beta_{12} (SIZE) + \varepsilon$$

Panel A: 1993 (692 Credit Unions, 353 Mutual S&Ls) Adj. $R^2 = .7590$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0175	.0071	2.466	.014
TYPE	.0033	.0022	1.486	.137
TPT	.0152	.3309	.046	.963
OPERATING	.1104	.2771	.398	.690
TYPE*TPT	.8345	.3431	2.432	.015
TYPE*OPERATING	.4443	.2806	1.584	.113
MORTGAGE	-.0008	.0024	-.355	.722
REGDEP	-.0029	.0041	-.705	.481
INVEST	-.0457	.0026	-17.464	.001
RISK	.2195	.2058	1.066	.286
K	.0361	.0102	3.548	.001
HHI	.0098	.0022	4.434	.001
SIZE	.0001	.0003	.078	.938

Panel B: 1994 (632 Credit Unions, 329 Mutual S&Ls) Adj. $R^2 = .7853$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0060	.0068	.880	.379
TYPE	-.0001	.0020	-.003	.997
TPT	.2684	.2729	.984	.325
OPERATING	.4608	.3468	1.329	.184
TYPE*TPT	.6927	.2859	2.423	.015
TYPE*OPERATING	.0448	.3436	.130	.896
MORTGAGE	-.0030	.0020	-1.478	.139
REGDEP	-.0010	.0039	-.255	.798
INVEST	-.0418	.0023	-18.427	.001
RISK	.0605	.1856	.326	.744
K	.0389	.0092	4.229	.001
HHI	.0082	.0018	4.489	.001
SIZE	.0004	.0002	1.723	.085

[1] See Table A1 for variable definitions.

Table B4: NIM: Associational Credit Unions

$$NIM = \beta_0 + \beta_1 (TYPE) + \beta_2 (TPT) + \beta_3 (OPERATING) + \beta_4 (TYPE*TPT) + \beta_5 (TYPE*OPERATING) + \beta_6 (MORTGAGE) + \beta_7 (REGDEP) + \beta_8 (INVEST) + \beta_9 (RISK) + \beta_{10} (K) + \beta_{11} (HHI) + \beta_{12} (SIZE) + \varepsilon$$

Panel A: 1993 (147 Credit Unions, 279 Mutual S&Ls) Adj. $R^2 = .8347$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0048	.0073	.653	.514
TYPE	-.0096	.0025	-3.894	.001
TPT	.1384	.2416	.573	.567
OPERATING	.4831	.2071	2.332	.020
TYPE*TPT	1.0599	.2874	3.687	.001
TYPE*OPERATING	.3934	.2492	1.579	.114
MORTGAGE	.0016	.0027	.604	.546
REGDEP	.0062	.0051	1.225	.221
INVEST	-.0263	.0032	-8.355	.001
RISK	.4743	.1963	2.416	.016
K	.0325	.0100	3.248	.001
HHI	.0075	.0032	2.295	.022
SIZE	-.0001	.0003	-.504	.614

Panel B: 1994 (161 Credit Unions, 269 Mutual S&Ls) Adj. $R^2 = .8611$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0096	.0069	1.397	.162
TYPE	-.0104	.0021	-4.930	.001
TPT	.3970	.1913	2.075	.038
OPERATING	.3476	.0600	5.793	.001
TYPE*TPT	.7789	.0741	10.507	.001
TYPE*OPERATING	.4939	.1441	3.428	.001
MORTGAGE	.007	.0025	.281	.779
REGDEP	.0031	.0045	.672	.502
INVEST	-.0286	.0028	-10.324	.001
RISK	.4494	.1091	4.120	.001
K	.0352	.0075	4.680	.001
HHI	-.0019	.0018	-1.081	.280
SIZE	-.0002	.0003	-.732	.464

[1] See Table A1 for variable definitions.

Table B5: NIM: Occupational Credit Unions

$$NIM = \beta_0 + \beta_1 (TYPE) + \beta_2 (TPT) + \beta_3 (OPERATING) + \beta_4 (TYPE*TPT) + \beta_5 (TYPE*OPERATING) + \beta_6 (MORTGAGE) + \beta_7 (REGDEP) + \beta_8 (INVEST) + \beta_9 (RISK) + \beta_{10} (K) + \beta_{11} (HHI) + \beta_{12} (SIZE) + \varepsilon$$

Panel A: 1993 (1,447 Credit Unions, 381 Mutual S&Ls) Adj. $R^2 = .7727$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0259	.0048	5.347	.001
TYPE	.0005	.0017	.316	.752
TPT	-.3160	.3628	-.871	.384
OPERATING	-.1604	.2949	-.544	.587
TYPE*TPT	1.1135	.3665	3.038	.002
TYPE*OPERATING	.6983	.2968	2.353	.019
MORTGAGE	-.0034	.0015	-2.273	.023
REGDEP	.0034	.0026	1.312	.190
INVEST	-.0550	.0018	-31.003	.001
RISK	.1657	.0813	2.039	.041
K	.0409	.0065	6.262	.001
HHI	.0046	.0015	3.061	.002
SIZE	-.0004	.0002	-2.032	.042

Panel B: 1994 (1,358 Credit Unions, 372 Mutual S&Ls) Adj. $R^2 = .7988$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0117	.0044	2.629	.009
TYPE	.0006	.0015	.403	.687
TPT	-.1380	.2775	-.497	.619
OPERATING	.4615	.1366	3.378	.001
TYPE*TPT	.8717	.2820	3.090	.002
TYPE*OPERATING	.0958	.1469	.652	.514
MORTGAGE	-.0036	.0013	-2.780	.005
REGDEP	.0041	.0024	1.763	.078
INVEST	-.0526	.0017	-31.506	.001
RISK	.1327	.1421	.934	.350
K	.0453	.0057	7.936	.001
HHI	.0035	.0013	2.780	.005
SIZE	.0001	.0002	.482	.629

[1] See Table A1 for variable definitions.

Table B6: NIM: Residential Credit Unions

$$NIM = \beta_0 + \beta_1(TYPE) + \beta_2(TPT) + \beta_3(OPERATING) + \beta_4(TYPE*TPT) + \beta_5(TYPE*OPERATING) + \beta_6(MORTGAGE) + \beta_7(REGDEP) + \beta_8(INVEST) + \beta_9(RISK) + \beta_{10}(K) + \beta_{11}(HHI) + \beta_{12}(SIZE) + \varepsilon$$

Panel A: 1993 (123 Credit Unions, 186 Mutual S&Ls) Adj. $R^2 = .7969$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0173	.0109	1.586	.113
TYPE	.0008	.0040	.212	.832
TPT	-.2459	.3681	-.668	.504
OPERATING	.3371	.2833	1.190	.234
TYPE*TPT	.9236	.4023	2.296	.022
TYPE*OPERATING	.0836	.3229	.259	.796
MORTGAGE	-.0065	.0047	-1.374	.169
REGDEP	.0063	.0083	.755	.450
INVEST	-.0324	.0044	-7.321	.001
RISK	.7752	.4390	1.766	.077
K	.0296	.0128	2.314	.021
HHI	.0038	.0045	.844	.399
SIZE	-.0002	.0004	-.552	.581

Panel B: 1994 (108 Credit Unions, 191 Mutual S&Ls) Adj. $R^2 = .8274$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0115	.0107	1.072	.284
TYPE	-.0032	.0043	-.740	.459
TPT	.1456	.2694	.540	.589
OPERATING	.5305	.3109	1.706	.088
TYPE*TPT	.7934	.3274	2.423	.015
TYPE*OPERATING	-.0612	.3506	-.175	.861
MORTGAGE	-.0016	.0035	-.445	.656
REGDEP	.0021	.0067	.320	.749
INVEST	-.0266	.0036	-7.361	.001
RISK	.0996	.1384	.720	.472
K	.0283	.0103	2.745	.006
HHI	-.0037	.0031	-1.190	.234
SIZE	-.0001	.0003	-.211	.833

[1] See Table A1 for variable definitions.

APPENDIX C:

TOTAL PERSONNEL AND TRAVEL EXPENDITURES RESULTS (H2)

Table C1: TPT: Full Sample

$$TPT = \beta_0 + \beta_1 (TYPE) + \beta_2 (NIM) + \beta_3 (OPERATING) + \beta_4 (TYPE*NIM) + \beta_5 (TYPE*OPERATING) + \beta_6 (FIXED) + \beta_7 (FTE) + \beta_8 (MORTGAGE) + \beta_9 (REGDEP) + \beta_{10} (INVEST) + \beta_{11} (WAGERATE) + \beta_{12} (RISK) + \beta_{13} (HHI) + \beta_{14} (SIZE) + \varepsilon$$

Panel A: 1993 (1,717 Credit Unions, 385 Mutual S&Ls) Adj. R^2 = .8043

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0133	.0029	4.562	.001
TYPE	.0043	.0005	9.412	.001
NIM	.1251	.0362	3.454	.001
OPERATING	.2475	.0900	2.750	.006
TYPE*NIM	.0022	.0343	.064	.949
TYPE*OPERATING	.1596	.0897	1.778	.075
FIXED	.0218	.0063	3.456	.001
FTE	.0002	.0001	3.497	.001
MORTGAGE	-.0006	.0005	-1.049	.294
REGDEP	-.0023	.0010	-2.201	.028
INVEST	.0014	.0008	1.710	.087
WAGERATE	-.0007	.0005	-1.271	.204
RISK	-.0872	.0450	-1.939	.052
HHI	-.0030	.0007	-4.151	.001
SIZE	-.0005	.0001	-3.678	.001

Panel B: 1994 (1,627 Credit Unions, 372 Mutual S&Ls) Adj. R^2 = .8011

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0157	.0028	5.653	.001
TYPE	.0047	.0005	9.890	.001
NIM	.3196	.0380	8.417	.001
OPERATING	.0014	.0488	.028	.978
TYPE*NIM	-.1557	.0355	-4.380	.001
TYPE*OPERATING	.3739	.0528	7.082	.001
FIXED	.0179	.0063	2.844	.004
FTE	.0002	.0001	3.398	.001
MORTGAGE	-.0010	.0005	-1.882	.060
REGDEP	-.0028	.0011	-2.457	.014
INVEST	.0036	.0008	4.304	.001
WAGERATE	-.0009	.0005	-1.677	.094
RISK	-.0380	.0635	-.598	.550
HHI	-.0028	.0007	-4.014	.001
SIZE	-.0006	.0001	-4.717	.001

[1] See Table A1 for variable definitions.

Table C2: TPT: Federally-Chartered Credit Unions

$$TPT = \beta_0 + \beta_1 (TYPE) + \beta_2 (NIM) + \beta_3 (OPERATING) + \beta_4 (TYPE*NIM) + \beta_5 (TYPE*OPERATING) + \beta_6 (FIXED) + \beta_7 (FTE) + \beta_8 (MORTGAGE) + \beta_9 (REGDEP) + \beta_{10} (INVEST) + \beta_{11} (WAGERATE) + \beta_{12} (RISK) + \beta_{13} (HHI) + \beta_{14} (SIZE) + \varepsilon$$

Panel A: 1993 (1,025 Credit Unions, 364 Mutual S&Ls) Adj. R^2 = .8326

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0089	.0034	2.627	.009
TYPE	.0042	.0005	7.902	.001
NIM	.1982	.0410	4.837	.001
OPERATING	.3221	.1000	3.222	.001
TYPE*NIM	-.0190	.0380	-.501	.616
TYPE*OPERATING	.0621	.1014	.612	.541
FIXED	.0118	.0081	1.453	.146
FTE	.0001	.0001	2.534	.011
MORTGAGE	-.0004	.0007	-.564	.573
REGDEP	-.0037	.0012	-2.962	.003
INVEST	.0044	.0010	4.479	.001
WAGERATE	-.0002	.0007	-.283	.777
RISK	-.0861	.0503	-1.709	.087
HHI	-.0034	.0008	-4.034	.001
SIZE	-.0003	.0001	-2.159	.031

Panel B: 1994 (995 Credit Unions, 352 Mutual S&Ls) Adj. R^2 = .8207

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0130	.0034	3.814	.001
TYPE	.0045	.0006	7.800	.001
NIM	.3908	.0452	8.643	.001
OPERATING	.0001	.0723	.001	.998
TYPE*NIM	-.1722	.0412	-4.182	.001
TYPE*OPERATING	.3324	.0781	4.257	.001
FIXED	.0068	.0084	.809	.418
FTE	.0002	.0001	2.445	.014
MORTGAGE	-.0015	.0007	-2.323	.020
REGDEP	-.0037	.0013	-2.789	.005
INVEST	.0062	.0011	5.840	.001
WAGERATE	-.0007	.0007	-1.039	.299
RISK	-.0784	.0648	-1.211	.226
HHI	-.0019	.0009	-2.192	.028
SIZE	-.0004	.0001	-3.023	.003

[1] See Table A1 for variable definitions.

Table C3: TPT: State-Chartered Credit Unions

$$TPT = \beta_0 + \beta_1 (TYPE) + \beta_2 (NIM) + \beta_3 (OPERATING) + \beta_4 (TYPE*NIM) + \beta_5 (TYPE*OPERATING) + \beta_6 (FIXED) + \beta_7 (FTE) + \beta_8 (MORTGAGE) + \beta_9 (REGDEP) + \beta_{10} (INVEST) + \beta_{11} (WAGERATE) + \beta_{12} (RISK) + \beta_{13} (HHI) + \beta_{14} (SIZE) + \varepsilon$$

Panel A: 1993 (692 Credit Unions, 353 Mutual S&Ls) Adj. $R^2 = .8759$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0103	.0039	2.650	.008
TYPE	.0041	.0007	5.897	.001
NIM	.0573	.0352	1.627	.104
OPERATING	.2426	.0938	2.587	.010
TYPE*NIM	.0415	.0344	1.208	.227
TYPE*OPERATING	.1683	.0933	1.804	.071
FIXED	.0369	.0091	4.070	.001
FTE	.0001	.0001	2.402	.016
MORTGAGE	-.0009	.0009	-1.012	.312
REGDEP	.0008	.0015	.517	.605
INVEST	-.0006	.0009	-.683	.495
WAGERATE	-.0003	.0007	-.375	.707
RISK	-.0863	.0769	-1.122	.262
HHI	-.0017	.0011	-1.576	.115
SIZE	-.0004	.0001	-2.951	.003

Panel B: 1994 (632 Credit Unions, 339 Mutual S&Ls) Adj. $R^2 = .8895$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0114	.0034	3.401	.001
TYPE	.0049	.0007	7.261	.001
NIM	.2190	.0401	5.466	.001
OPERATING	.0983	.0883	1.112	.266
TYPE*NIM	-.0968	.0399	-2.423	.015
TYPE*OPERATING	.3090	.0890	3.471	.001
FIXED	.0359	.0083	4.328	.001
FTE	.0001	.0001	2.982	.003
MORTGAGE	-.0003	.0008	-.379	.705
REGDEP	.0002	.0016	.140	.889
INVEST	.0008	.0008	1.001	.317
WAGERATE	-.0004	.0007	-.569	.570
RISK	.0922	.0580	1.591	.112
HHI	-.0026	.0007	-3.598	.001
SIZE	-.0005	.0001	-4.312	.001

[1] See Table A1 for variable definitions.

Table C4: TPT: Associational Credit Unions

$$TPT = \beta_0 + \beta_1 (TYPE) + \beta_2 (NIM) + \beta_3 (OPERATING) + \beta_4 (TYPE*NIM) + \beta_5 (TYPE*OPERATING) + \beta_6 (FIXED) + \beta_7 (FTE) + \beta_8 (MORTGAGE) + \beta_9 (REGDEP) + \beta_{10} (INVEST) + \beta_{11} (WAGERATE) + \beta_{12} (RISK) + \beta_{13} (HHI) + \beta_{14} (SIZE) + \varepsilon$$

Panel A: 1993 (147 Credit Unions, 279 Mutual S&Ls) Adj. $R^2 = .9029$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0017	.0047	.368	.713
TYPE	.0032	.0009	3.524	.001
NIM	.1003	.0447	2.242	.025
OPERATING	.2814	.1010	2.787	.005
TYPE*NIM	.0721	.0466	1.549	.121
TYPE*OPERATING	.0206	.1137	.181	.856
FIXED	.0319	.0126	2.541	.011
FTE	.0001	.0000	.524	.600
MORTGAGE	-.0022	.0012	-1.844	.065
REGDEP	.0003	.0018	.148	.882
INVEST	.0010	.0011	.941	.347
WAGERATE	.0019	.0010	1.823	.068
RISK	-.0997	.0623	-1.600	.110
HHI	-.0037	.0012	-2.952	.003
SIZE	-.0002	.0001	-1.333	.182

Panel B: 1994 (161 Credit Unions, 269 Mutual S&Ls) Adj. R = .8982

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0087	.0050	1.745	.081
TYPE	.0044	.0009	5.072	.001
NIM	.3554	.0479	7.412	.001
OPERATING	.0198	.0526	.377	.706
TYPE*NIM	-.1202	.0478	-2.517	.012
TYPE*OPERATING	.2002	.0912	2.195	.028
FIXED	.0232	.0114	2.029	.042
FTE	.0001	.0001	1.050	.294
MORTGAGE	-.0028	.0011	-2.447	.014
REGDEP	-.0021	.0022	-.935	.350
INVEST	.0039	.0011	3.534	.001
WAGERATE	.0001	.0010	.003	.997
RISK	-.1547	.0767	-2.017	.044
HHI	-.0013	.0010	-1.326	.185
SIZE	-.0003	.0002	-1.784	.074

[1] See Table A1 for variable definitions.

Table C5: TPT: Occupational Credit Unions

$$TPT = \beta_0 + \beta_1(TYPE) + \beta_2(NIM) + \beta_3(OPERATING) + \beta_4(TYPE*NIM) + \beta_5(TYPE*OPERATING) + \beta_6(FIXED) + \beta_7(FTE) + \beta_8(MORTGAGE) + \beta_9(REGDEP) + \beta_{10}(INVEST) + \beta_{11}(WAGERATE) + \beta_{12}(RISK) + \beta_{13}(HHI) + \beta_{14}(SIZE) + \varepsilon$$

Panel A: 1993 (1,447 Credit Unions, 381 Mutual S&Ls) Adj. R^2 = .8252

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0147	.0031	4.703	.001
TYPE	.0041	.0005	8.223	.001
NIM	.1085	.0349	3.106	.002
OPERATING	.2413	.0916	2.633	.008
TYPE*NIM	.0138	.0331	.418	.676
TYPE*OPERATING	.1551	.0918	1.690	.091
FIXED	.0169	.0072	2.354	.019
FTE	.0001	.0000	2.973	.003
MORTGAGE	-.0011	.0006	-1.813	.070
REGDEP	-.0019	.0011	-1.633	.103
INVEST	.0007	.0009	.866	.387
WAGERATE	-.0007	.0006	-1.163	.245
RISK	-.0789	.0567	-1.392	.164
HHI	-.0030	.0008	-3.981	.001
SIZE	-.0005	.0001	-3.759	.001

Panel B: 1994 (1,358 Credit Unions, 372 Mutual S&Ls) Adj. R^2 = .8248

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0150	.0030	4.943	.001
TYPE	.0044	.0005	8.082	.001
NIM	.2963	.0377	7.864	.001
OPERATING	.0021	.0436	.049	.961
TYPE*NIM	-.1469	.0356	-4.126	.001
TYPE*OPERATING	.3943	.0499	7.899	.001
FIXED	.0116	.0073	1.595	.111
FTE	.0002	.0001	3.166	.002
MORTGAGE	-.0011	.0006	-1.779	.075
REGDEP	-.0018	.0013	-1.404	.160
INVEST	.0032	.0009	3.680	.001
WAGERATE	-.0005	.0006	-.907	.364
RISK	.1940	.0923	2.101	.036
HHI	-.0025	.0008	-3.234	.001
SIZE	-.0006	.0001	-4.745	.001

[1] See Table A1 for variable definitions.

Table C6: TPT: Residential Credit Unions

$$TPT = \beta_0 + \beta_1(TYPE) + \beta_2(NIM) + \beta_3(OPERATING) + \beta_4(TYPE*NIM) + \beta_5(TYPE*OPERATING) + \beta_6(FIXED) + \beta_7(FTE) + \beta_8(MORTGAGE) + \beta_9(REGDEP) + \beta_{10}(INVEST) + \beta_{11}(WAGERATE) + \beta_{12}(RISK) + \beta_{13}(HHI) + \beta_{14}(SIZE) + \varepsilon$$

Panel A: 1993 (123 Credit Unions, 186 Mutual S&Ls) Adj. R^2 = .9210

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0059	.0083	.708	.479
TYPE	.0049	.0016	3.139	.002
NIM	.0016	.0421	.038	.969
OPERATING	.2336	.1114	2.098	.036
TYPE*NIM	.0816	.0468	1.745	.081
TYPE*OPERATING	.2559	.1259	2.033	.042
FIXED	.0259	.0206	1.258	.208
FTE	.0001	.0000	2.072	.038
MORTGAGE	.0011	.0015	.683	.495
REGDEP	.0040	.0027	1.496	.135
INVEST	-.0012	.0012	-1.070	.285
WAGERATE	-.0007	.0020	-.328	.743
RISK	-.1177	.1074	-1.096	.273
HHI	-.0027	.0036	-.743	.457
SIZE	-.0003	.0002	-1.627	.104

Panel B: 1994 (108 Credit Unions, 191 Mutual S&Ls) Adj. R^2 = .9469

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0088	.0065	1.354	.176
TYPE	.0054	.0012	4.328	.001
NIM	.1533	.0549	2.790	.005
OPERATING	.1321	.1197	1.104	.270
TYPE*NIM	-.0443	.0571	-.776	.438
TYPE*OPERATING	.3251	.1307	2.488	.013
FIXED	.0352	.0147	2.392	.017
FTE	.0001	.0000	2.590	.010
MORTGAGE	.0005	.0010	.513	.608
REGDEP	.0010	.0021	.469	.639
INVEST	-.0013	.0010	-1.324	.185
WAGERATE	.0015	.0013	1.137	.255
RISK	.1563	.0870	1.796	.072
HHI	-.0030	.0010	-2.897	.004
SIZE	-.0007	.0002	-3.511	.001

[1] See Table A1 for variable definitions.

APPENDIX D:

OTHER OPERATING EXPENDITURE RESULTS (H3)

Table D1: OPERATING: Full Sample

$$\text{OPERATING} = \beta_0 + \beta_1(\text{TYPE}) + \beta_2(\text{NIM}) + \beta_3(\text{TPT}) + \beta_4(\text{TYPE*NIM}) + \beta_5(\text{TYPE*TPT}) + \beta_6(\text{FIXED}) + \beta_7(\text{FTE}) + \beta_8(\text{MORTGAGE}) + \beta_9(\text{REGDEP}) + \beta_{10}(\text{INVEST}) + \beta_{11}(\text{HHI}) + \beta_{12}(\text{SIZE}) + \varepsilon$$

Panel A: 1993 (1,717 Credit Unions, 385 Mutual S&Ls) Adj. $R^2 = .7811$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0113	.0022	5.129	.001
TYPE	.0011	.0006	1.774	.076
NIM	.1453	.0408	3.559	.001
TPT	.1563	.0756	2.067	.039
TYPE*NIM	-.0336	.0391	-.859	.390
TYPE*TPT	.3674	.0785	4.682	.001
FIXED	.0431	.0082	5.245	.001
FTE	.0001	.0001	2.553	.011
MORTGAGE	-.0034	.0006	-6.050	.001
REGDEP	.0018	.0011	1.641	.101
INVEST	.0017	.0009	1.903	.057
HHI	-.0018	.0009	-1.922	.055
SIZE	-.0005	.0001	-4.934	.001

Panel B: 1994 (1,627 Credit Unions, 372 Mutual S&Ls) Adj. $R^2 = .7768$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0055	.0022	2.463	.014
TYPE	.0017	.0006	2.905	.004
NIM	.2328	.0455	5.117	.001
TPT	.0726	.0740	.981	.327
TYPE*NIM	-.0781	.0417	-1.875	.061
TYPE*TPT	.3770	.0776	4.855	.001
FIXED	.0347	.0082	4.226	.001
FTE	.0001	.0001	1.349	.177
MORTGAGE	-.0036	.0006	-6.467	.001
REGDEP	.0034	.0012	2.917	.004
INVEST	.0039	.0011	3.467	.001
HHI	-.0012	.0007	-1.648	.009
SIZE	-.0003	.0001	-2.940	.003

[1] See Table A1 for variable definitions.

Table D2: OPERATING: Federally-Chartered Credit Unions

$$\text{OPERATING} = \beta_0 + \beta_1(\text{TYPE}) + \beta_2(\text{NIM}) + \beta_3(\text{TPT}) + \beta_4(\text{TYPE*NIM}) + \beta_5(\text{TYPE*TPT}) + \beta_6(\text{FIXED}) + \beta_7(\text{FTE}) + \beta_8(\text{MORTGAGE}) + \beta_9(\text{REGDEP}) + \beta_{10}(\text{INVEST}) + \beta_{11}(\text{HHI}) + \beta_{12}(\text{SIZE}) + \varepsilon$$

Panel A: 1993 (1,025 Credit Unions, 364 Mutual S&Ls) Adj. R^2 = .8130

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0070	.0024	2.913	.004
TYPE	.0019	.0007	2.600	.009
NIM	.1562	.0456	3.425	.001
TPT	.2386	.0762	3.129	.002
TYPE*NIM	-.0138	.0420	-.329	.742
TYPE*TPT	.2288	.0856	2.674	.007
FIXED	.0412	.0089	4.649	.001
FTE	.0001	.0001	2.054	.040
MORTGAGE	-.0029	.0007	-4.320	.001
REGDEP	.0015	.0014	1.054	.292
INVEST	.0026	.0012	2.245	.025
HHI	-.0003	.0012	-.285	.776
SIZE	-.0003	.0001	-2.868	.004

Panel B: 1994 (995 Credit Unions, 352 Mutual S&Ls) Adj. R^2 = .8062

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0027	.0025	1.065	.287
TYPE	.0030	.0007	4.366	.001
NIM	.2607	.0515	5.061	.001
TPT	.1207	.0782	1.544	.123
TYPE*NIM	-.0594	.0450	-1.318	.187
TYPE*TPT	.2271	.0856	2.653	.008
FIXED	.0434	.0090	4.836	.001
FTE	.0001	.0001	1.110	.267
MORTGAGE	-.0030	.0007	-4.489	.001
REGDEP	.0026	.0014	1.871	.061
INVEST	.0053	.0014	3.689	.001
HHI	-.0005	.0009	-.526	.599
SIZE	-.0002	.0001	-1.673	.094

[1] See Table A1 for variable definitions.

Table D3: OPERATING: State-Chartered Credit Unions

$$\text{OPERATING} = \beta_0 + \beta_1(\text{TYPE}) + \beta_2(\text{NIM}) + \beta_3(\text{TPT}) + \beta_4(\text{TYPE*NIM}) + \beta_5(\text{TYPE*TPT}) + \beta_6(\text{FIXED}) + \beta_7(\text{FTE}) + \beta_8(\text{MORTGAGE}) + \beta_9(\text{REGDEP}) + \beta_{10}(\text{INVEST}) + \beta_{11}(\text{HHI}) + \beta_{12}(\text{SIZE}) + \varepsilon$$

Panel A: 1993 (692 Credit Unions, 353 Mutual S&Ls) Adj. R^2 = .8499

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0159	.0033	4.776	.001
TYPE	-.0001	.0008	-.119	.905
NIM	.1404	.0424	3.310	.001
TPT	.1211	.0895	1.354	.176
TYPE*NIM	-.0544	.0430	-1.267	.205
TYPE*TPT	.4744	.0916	5.180	.001
FIXED	.0387	.0130	2.975	.003
FTE	.0001	.0000	2.197	.028
MORTGAGE	-.0043	.0009	-4.657	.001
REGDEP	.0004	.0016	.231	.817
INVEST	.0011	.0010	1.051	.293
HHI	-.0035	.0011	-3.359	.001
SIZE	-.0006	.0002	-4.159	.001

Panel B: 1994 (632 Credit Unions, 339 Mutual S&Ls) Adj. R^2 = .8589

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0101	.0031	3.223	.001
TYPE	-.0003	.0008	-.409	.683
NIM	.1838	.0445	4.127	.001
TPT	.1091	.0790	1.381	.167
TYPE*NIM	-.0900	.0443	-2.030	.042
TYPE*TPT	.5120	.0839	6.103	.001
FIXED	.0184	.0128	1.434	.152
FTE	.0001	.0000	1.939	.052
MORTGAGE	-.0047	.0009	-5.545	.001
REGDEP	.0021	.0017	1.227	.220
INVEST	.0017	.0011	1.581	.114
HHI	-.0011	.0007	-1.573	.116
SIZE	-.0004	.0001	-2.941	.003

[1] See Table A1 for variable definitions.

Table D4: OPERATING: Associational Credit Unions

$$\text{OPERATING} = \beta_0 + \beta_1(\text{TYPE}) + \beta_2(\text{NIM}) + \beta_3(\text{TPT}) + \beta_4(\text{TYPE*NIM}) + \beta_5(\text{TYPE*TPT}) + \beta_6(\text{FIXED}) + \beta_7(\text{FTE}) + \beta_8(\text{MORTGAGE}) + \beta_9(\text{REGDEP}) + \beta_{10}(\text{INVEST}) + \beta_{11}(\text{HHI}) + \beta_{12}(\text{SIZE}) + \varepsilon$$

Panel A: 1993 (147 Credit Unions, 279 Mutual S&Ls) Adj. R^2 = .8993

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0107	.0044	2.442	.015
TYPE	.0025	.0012	2.012	.044
NIM	.1278	.0532	2.400	.016
TPT	.2611	.1037	2.519	.012
TYPE*NIM	.0243	.0586	.414	.679
TYPE*TPT	.1168	.1361	.858	.391
FIXED	.0267	.0129	2.077	.038
FTE	.0001	.0001	1.728	.084
MORTGAGE	-.0055	.0013	-4.112	.001
REGDEP	.0006	.0021	.280	.780
INVEST	-.0001	.0011	-.034	.973
HHI	-.0010	.0014	-.764	.445
SIZE	-.0003	.0002	-1.600	.110

Panel B: 1994 (161 Credit Unions, 269 Mutual S&Ls) Adj. R^2 = .8643

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0038	.0047	.811	.417
TYPE	.0034	.0010	3.317	.001
NIM	.2520	.0711	3.543	.001
TPT	.1240	.1067	1.161	.246
TYPE*NIM	-.0405	.0656	-.618	.537
TYPE*TPT	.1521	.1354	1.124	.261
FIXED	.0242	.0164	1.478	.139
FTE	.0001	.0001	1.336	.182
MORTGAGE	-.0048	.0012	-3.993	.001
REGDEP	.0037	.0022	1.705	.088
INVEST	.0036	.0022	1.616	.106
HHI	-.0004	.0010	-.380	.704
SIZE	-.0002	.0002	-.953	.340

[1] See Table A1 for variable definitions.

Table D5: OPERATING: Occupational Credit Unions

$$\text{OPERATING} = \beta_0 + \beta_1(\text{TYPE}) + \beta_2(\text{NIM}) + \beta_3(\text{TPT}) + \beta_4(\text{TYPE*NIM}) + \beta_5(\text{TYPE*TPT}) + \beta_6(\text{FIXED}) + \beta_7(\text{FTE}) + \beta_8(\text{MORTGAGE}) + \beta_9(\text{REGDEP}) + \beta_{10}(\text{INVEST}) + \beta_{11}(\text{HHI}) + \beta_{12}(\text{SIZE}) + \varepsilon$$

Panel A: 1993 (1,447 Credit Unions, 381 Mutual S&Ls) Adj. $R^2 = .7949$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0103	.0023	4.396	.001
TYPE	.0013	.0007	1.949	.051
NIM	.1447	.0423	3.425	.001
TPT	.1913	.0747	2.560	.010
TYPE*NIM	-.0396	.0405	-.976	.329
TYPE*TPT	.3339	.0791	4.222	.001
FIXED	.0406	.0097	4.191	.001
FTE	.0001	.0000	2.245	.025
MORTGAGE	-.0033	.0007	-4.723	.001
REGDEP	.0009	.0012	.689	.491
INVEST	.0015	.0010	1.508	.132
HHI	-.0020	.0010	-1.886	.059
SIZE	-.0004	.0001	-3.744	.001

Panel B: 1994 (1,358 Credit Unions, 372 Mutual S&Ls) Adj. $R^2 = .7974$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0063	.0025	2.557	.011
TYPE	.0020	.0007	2.962	.003
NIM	.2229	.0466	4.784	.001
TPT	.0961	.0738	1.302	.193
TYPE*NIM	-.0836	.0419	-1.996	.046
TYPE*TPT	.3855	.0792	4.869	.001
FIXED	.0366	.0096	3.820	.001
FTE	.0001	.0000	1.235	.217
MORTGAGE	-.0029	.0007	-4.045	.001
REGDEP	.0015	.0013	1.182	.237
INVEST	.0030	.0013	2.336	.019
HHI	-.0014	.0008	-1.796	.073
SIZE	-.0003	.0001	-2.479	.013

[1] See Table A1 for variable definitions.

Table D6: OPERATING: Residential Credit Unions

$$\text{OPERATING} = \beta_0 + \beta_1(\text{TYPE}) + \beta_2(\text{NIM}) + \beta_3(\text{TPT}) + \beta_4(\text{TYPE*NIM}) + \beta_5(\text{TYPE*TPT}) + \beta_6(\text{FIXED}) + \beta_7(\text{FTE}) + \beta_8(\text{MORTGAGE}) + \beta_9(\text{REGDEP}) + \beta_{10}(\text{INVEST}) + \beta_{11}(\text{HHI}) + \beta_{12}(\text{SIZE}) + \varepsilon$$

Panel A: 1993 (123 Credit Unions, 186 Mutual S&Ls) Adj. R^2 = .9079

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0224	.0061	3.652	.001
TYPE	.0005	.0017	.283	.777
NIM	.2524	.0652	3.871	.001
TPT	.0315	.1379	.229	.819
TYPE*NIM	-.1956	.0742	-2.638	.008
TYPE*TPT	.6216	.1463	4.248	.001
FIXED	.0578	.0261	2.217	.027
FTE	.0002	.0000	3.470	.001
MORTGAGE	-.0036	.0016	-2.237	.025
REGDEP	-.0034	.0033	-1.005	.315
INVEST	.0029	.0013	2.265	.024
HHI	-.0008	.0022	-.345	.730
SIZE	-.0009	.0003	-3.744	.001

Panel B: 1994 (108 Credit Unions, 191 Mutual S&Ls) Adj. R^2 = .9249

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0056	.0056	.997	.319
TYPE	.0009	.0013	.667	.505
NIM	.2408	.0614	3.922	.001
TPT	.2217	.1268	1.748	.080
TYPE*NIM	-.1690	.0688	-2.458	.014
TYPE*TPT	.4456	.1399	3.186	.001
FIXED	.0338	.0201	1.679	.093
FTE	.0001	.0001	1.087	.277
MORTGAGE	-.0035	.0014	-2.540	.011
REGDEP	.0020	.0033	.617	.537
INVEST	.0026	.0013	2.024	.043
HHI	.0021	.0013	1.691	.091
SIZE	-.0003	.0002	-1.407	.159

[1] See Table A1 for variable definitions.

APPENDIX E:

FULL-TIME EQUIVALENT EMPLOYEE RESULTS (H4)

Table E1: FTE: Full Sample

$$FTE = \beta_0 + \beta_1 (TYPE) + \beta_2 (NIM) + \beta_3 (MORTGAGE) + \beta_4 (REGDEP) + \beta_5 (INVEST) + \beta_6 (WAGERATE) + \beta_7 (HHI) + \beta_8 (SIZE) + \beta_9 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (1,717 Credit Unions, 385 Mutual S&Ls) Adj. R^2 = .5587

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-42.0187	6.2266	-6.748	.001
TYPE	13.9011	6.1733	2.252	.024
NIM	5.6601	4.3790	1.293	.196
MORTGAGE	-1.3150	.2500	-5.261	.001
REGDEP	.8035	.4413	1.821	.069
INVEST	-1.7187	.5173	-3.323	.001
WAGERATE	-.1918	.2628	-.730	.465
HHI	-.0889	.3854	-.231	.818
SIZE	2.5126	.3281	7.657	.001
TYPE*SIZE	-.7429	.3400	-2.185	.029

Panel B: 1994 (1,627 Credit Unions, 372 Mutual S&Ls) Adj. R^2 = .5720

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-41.6344	6.2379	-6.674	.001
TYPE	14.3079	6.0184	2.377	.017
NIM	15.1082	4.0607	3.721	.001
MORTGAGE	-1.1206	.2742	-4.087	.001
REGDEP	.8171	.4178	1.956	.050
INVEST	-.5781	.3877	-1.491	.136
WAGERATE	-.1670	.2571	-.649	.516
HHI	.1043	.2815	.371	.711
SIZE	2.4469	.3320	7.371	.001
TYPE*SIZE	-.7742	.3393	-2.282	.022

[1] See Table A1 for variable definitions.

Table E2: FTE: Federally-Chartered Credit Unions

$$FTE = \beta_0 + \beta_1 (TYPE) + \beta_2 (NIM) + \beta_3 (MORTGAGE) + \beta_4 (REGDEP) + \beta_5 (INVEST) + \beta_6 (WAGERATE) + \beta_7 (HHI) + \beta_8 (SIZE) + \beta_9 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (1,205 Credit Unions, 364 Mutual S&Ls) Adj. $R^2 = .5385$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-42.5405	6.7345	-6.317	.001
TYPE	12.7226	6.5671	1.937	.053
NIM	8.4355	8.0131	1.053	.292
MORTGAGE	-1.4911	.3320	-4.491	.001
REGDEP	.7723	.5927	1.303	.193
INVEST	-1.534	.8338	-1.841	.066
WAGERATE	.0788	.3989	.198	.843
HHI	.1798	.5381	.334	.738
SIZE	2.5082	.3439	7.293	.001
TYPE*SIZE	-.6847	.3626	-1.888	.059

Panel B: 1994 (995 Credit Unions, 352 Mutual S&Ls) Adj. $R^2 = .5549$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-41.9857	6.6147	-6.347	.001
TYPE	13.6017	6.3285	2.149	.032
NIM	16.3481	5.5821	2.929	.003
MORTGAGE	-1.3367	.3710	-3.603	.001
REGDEP	.7672	.5117	1.499	.134
INVEST	-.3551	.5322	-.667	.505
WAGERATE	.1468	.3811	.385	.700
HHI	-.0306	.3797	-.081	.936
SIZE	2.4331	.3429	7.095	.001
TYPE*SIZE	-.7433	.3580	-2.076	.038

[1] See Table A1 for variable definitions.

Table E3: FTE: State-Chartered Credit Unions

$$FTE = \beta_0 + \beta_1 (TYPE) + \beta_2 (NIM) + \beta_3 (MORTGAGE) + \beta_4 (REGDEP) + \beta_5 (INVEST) + \beta_6 (WAGERATE) + \beta_7 (HHI) + \beta_8 (SIZE) + \beta_9 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (692 Credit Unions, 353 Mutual S&Ls) Adj. R^2 = .5314

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-43.4061	6.5746	-6.602	.001
TYPE	15.3406	6.5831	2.330	.020
NIM	-.7125	5.9796	-.119	.905
MORTGAGE	-1.1037	.4050	-2.725	.006
REGDEP	2.1203	.8212	2.582	.010
INVEST	-2.5994	.7730	-3.363	.001
WAGERATE	-.1516	.4100	-.370	.712
HHI	-.1515	.7147	-.212	.832
SIZE	2.5240	.3389	7.447	.001
TYPE*SIZE	-.8044	.3651	-2.203	.028

Panel B: 1994 (632 Credit Unions, 339 Mutual S&Ls) Adj. R^2 = .5616

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-42.6597	6.8467	-6.231	.001
TYPE	14.3340	6.2089	2.390	.021
NIM	14.3832	5.6481	2.547	.011
MORTGAGE	-1.1953	.5602	-2.134	.033
REGDEP	2.1972	.7854	2.798	.005
INVEST	-.9922	.5009	-1.981	.048
WAGERATE	-.3348	.3866	-.866	.386
HHI	.3775	.4201	.899	.369
SIZE	2.4666	.3491	7.066	.001
TYPE*SIZE	-.7768	.3573	-2.174	.030

[1] See Table A1 for variable definitions.

Table E4: FTE: Associational Credit Unions

$$FTE = \beta_0 + \beta_1 (TYPE) + \beta_2 (NIM) + \beta_3 (MORTGAGE) + \beta_4 (REGDEP) + \beta_5 (INVEST) + \beta_6 (WAGERATE) + \beta_7 (HHI) + \beta_8 (SIZE) + \beta_9 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (147 Credit Unions, 279 Mutual S&Ls) Adj. $R^2 = .4327$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-46.5244	7.7265	-6.021	.001
TYPE	20.4986	8.6623	2.366	.018
NIM	1.6212	13.8097	.117	.907
MORTGAGE	-.9976	.5814	-1.716	.086
REGDEP	4.0686	1.7399	2.338	.019
INVEST	-2.6876	1.4524	-1.850	.064
WAGERATE	1.3766	.7098	1.939	.052
HHI	.6132	1.1843	.518	.605
SIZE	2.3747	.3954	6.006	.001
TYPE*SIZE	-1.1154	.4905	-2.274	.023

Panel B: 1994 (161 Credit Unions, 269 Mutual S&Ls) Adj. $R^2 = .5175$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-47.8719	8.7834	-5.450	.001
TYPE	23.3186	7.3442	3.175	.001
NIM	21.6308	10.8383	1.996	.046
MORTGAGE	-1.0162	.8871	-1.146	.252
REGDEP	3.7288	1.5430	2.416	.016
INVEST	.1241	.8429	.147	.883
WAGERATE	.5431	.6412	.847	.397
HHI	1.1157	.9844	1.133	.257
SIZE	2.5166	.4153	6.060	.001
TYPE*SIZE	-1.3052	.4303	-3.034	.002

[1] See Table A1 for variable definitions.

Table E5: FTE: Occupational Credit Unions

$$FTE = \beta_0 + \beta_1 (TYPE) + \beta_2 (NIM) + \beta_3 (MORTGAGE) + \beta_4 (REGDEP) + \beta_5 (INVEST) + \beta_6 (WAGERATE) + \beta_7 (HHI) + \beta_8 (SIZE) + \beta_9 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (1,447 Credit Unions, 381 Mutual S&Ls) Adj. R^2 = .5483

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-41.5371	6.3297	-6.562	.001
TYPE	12.8431	6.2970	2.040	.041
NIM	4.3343	5.1618	.840	.401
MORTGAGE	-1.6539	.3380	-4.894	.001
REGDEP	.8241	.5114	1.611	.107
INVEST	-2.0224	.6373	-3.173	.002
WAGERATE	-.1579	.3065	-.515	.606
HHI	.0335	.4468	.075	.940
SIZE	2.5020	.3297	7.589	.001
TYPE*SIZE	-.6938	.3469	-2.000	.046

Panel B: 1994 (1,358 Credit Unions, 372 Mutual S&Ls) Adj. R^2 = .5663

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-41.0468	6.2797	-6.536	.001
TYPE	12.2592	6.0349	2.031	.042
NIM	13.9877	4.6996	2.976	.003
MORTGAGE	-1.6970	.4150	-4.089	.001
REGDEP	.7918	.4980	1.590	.112
INVEST	-.8341	.4767	-1.750	.080
WAGERATE	-.1141	.3043	-.375	.708
HHI	.2450	.3263	.751	.453
SIZE	2.4401	.3313	7.366	.001
TYPE*SIZE	-.6768	.3420	-1.979	.048

[1] See Table A1 for variable definitions.

Table E6: FTE: Residential Credit Unions

$$FTE = \beta_0 + \beta_1 (TYPE) + \beta_2 (NIM) + \beta_3 (MORTGAGE) + \beta_4 (REGDEP) + \beta_5 (INVEST) + \beta_6 (WAGERATE) + \beta_7 (HHI) + \beta_8 (SIZE) + \beta_9 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (123 Credit Unions, 186 Mutual S&Ls) Adj. $R^2 = .6132$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-55.9360	9.8222	-5.695	.001
TYPE	27.4538	8.9952	3.052	.002
NIM	-9.4270	11.8561	-.795	.427
MORTGAGE	-2.2298	.9257	-2.409	.016
REGDEP	4.5519	2.0051	2.270	.023
INVEST	-3.2224	1.0581	-3.045	.002
WAGERATE	.3880	1.1229	.346	.730
HHI	.3648	1.6029	.228	.820
SIZE	3.0694	.4093	7.498	.001
TYPE*SIZE	-1.4852	.4894	-3.035	.002

Panel B: 1994 (108 Credit Unions, 191 Mutual S&Ls) Adj. $R^2 = .5503$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	-52.3446	10.9145	-4.796	.001
TYPE	23.4199	8.7528	2.676	.007
NIM	17.4709	15.3075	1.141	.254
MORTGAGE	-3.0509	1.5632	-1.952	.051
REGDEP	5.9110	2.2677	2.607	.009
INVEST	-1.5367	1.0480	-1.466	.143
WAGERATE	-1.0025	1.0763	-.931	.352
HHI	2.4648	1.6908	1.458	.145
SIZE	2.9890	.5238	5.706	.001
TYPE*SIZE	-1.3368	.5082	-2.630	.009

[1] See Table A1 for variable definitions.

APPENDIX F:

TOTAL FIXED ASSET RESULTS (H5)

Table F1: FIXED: Full Sample

$$FIXED = \beta_0 + \beta_1 (TYPE) + \beta_2 (K) + \beta_3 (HHI) + \beta_4 (SIZE) + \beta_5 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (1,717 Credit Unions, 385 Mutual S&Ls) Adj. $R^2 = .0248$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0109	.0068	1.610	.107
TYPE	-.0080	.0083	-.971	.332
K	-.0235	.0116	-2.022	.043
HHI	.0037	.0027	1.400	.162
SIZE	.0001	.0003	.420	.674
TYPE*SIZE	.0008	.0005	1.662	.096

Panel B: 1994 (1,627 Credit Unions, 372 Mutual S&Ls) Adj. $R^2 = .0253$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0127	.0070	1.831	.067
TYPE	-.0158	.0085	-1.855	.064
K	-.0162	.0112	-1.442	.149
HHI	-.0008	.0021	-.376	.707
SIZE	.0001	.0004	.208	.835
TYPE*SIZE	.0012	.0005	2.561	.010

[1] See Table A1 for variable definitions.

Table F2: FIXED: Federally-Chartered Credit Unions

$$FIXED = \beta_0 + \beta_1 (TYPE) + \beta_2 (K) + \beta_3 (HHI) + \beta_4 (SIZE) + \beta_5 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (1,025 Credit Unions, 364 Mutual S&Ls) Adj. $R^2 = .0268$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0109	.0070	1.544	.123
TYPE	-.0143	.0091	-1.567	.117
K	-.0216	.0117	-1.851	.064
HHI	.0090	.0032	2.864	.004
SIZE	.0001	.0004	.245	.807
TYPE*SIZE	.0010	.0005	2.023	.043

Panel B: 1994 (995 Credit Unions, 352 Mutual S&Ls) Adj. $R^2 = .0311$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0160	.0069	2.303	.021
TYPE	-.0224	.0090	-2.493	.013
K	-.0316	.0111	-2.857	.004
HHI	.0034	.0023	1.453	.146
SIZE	-.0001	.0004	-.209	.834
TYPE*SIZE	.0015	.0005	2.978	.003

[1] See Table A1 for variable definitions.

Table F3: FIXED: State-Chartered Credit Unions

$$FIXED = \beta_0 + \beta_1 (TYPE) + \beta_2 (K) + \beta_3 (HHI) + \beta_4 (SIZE) + \beta_5 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (692 Credit Unions, 353 Mutual S&Ls) Adj. $R^2 = .0721$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0121	.0074	1.629	.103
TYPE	-.0032	.0112	-.286	.775
K	-.0359	.0195	-1.839	.066
HHI	-.0036	.0037	-.959	.338
SIZE	.0002	.0004	.506	.613
TYPE*SIZE	.0007	.0006	1.030	.303

Panel B: 1994 (632 Credit Unions, 339 Mutual S&Ls) Adj. $R^2 = .0686$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0104	.0079	1.322	.186
TYPE	-.0085	.0121	-.708	.479
K	-.0056	.0185	-.303	.762
HHI	-.0054	.0028	-1.902	.057
SIZE	.0002	.0004	.428	.668
TYPE*SIZE	.0010	.0007	1.444	.149

[1] See Table A1 for variable definitions.

Table F4: FIXED: Associational Credit Unions

$$FIXED = \beta_0 + \beta_1 (TYPE) + \beta_2 (K) + \beta_3 (HHI) + \beta_4 (SIZE) + \beta_5 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (147 Credit Unions, 279 Mutual S&Ls) Adj. $R^2 = .0648$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0193	.0075	2.567	.010
TYPE	-.0503	.0328	-1.533	.125
K	-.0596	.0184	-3.236	.001
HHI	.0053	.0062	.844	.399
SIZE	-.0002	.0004	-.494	.622
TYPE*SIZE	.0033	.0020	1.668	.095

Panel B: 1994 (161 Credit Unions, 269 Mutual S&Ls) Adj. $R^2 = .0754$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0259	.0087	2.984	.003
TYPE	-.0677	.0795	-.852	.394
K	-.0611	.0168	-3.636	.001
HHI	.0011	.0042	.257	.797
SIZE	-.0004	.0004	-1.060	.289
TYPE*SIZE	.0042	.0015	2.815	.005

[1] See Table A1 for variable definitions.

Table F5: FIXED: Occupational Credit Unions

$$FIXED = \beta_0 + \beta_1 (TYPE) + \beta_2 (K) + \beta_3 (HHI) + \beta_4 (SIZE) + \beta_5 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (1,447 Credit Unions, 381 Mutual S&Ls) Adj. R^2 = .0287

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0108	.0069	1.558	.119
TYPE	-.0096	.0086	-1.114	.265
K	-.0248	.0133	-1.864	.062
HHI	.0069	.0029	2.392	.017
SIZE	.0001	.0004	.374	.708
TYPE*SIZE	.0008	.0005	1.689	.091

Panel B: 1994 (1,358 Credit Unions, 372 Mutual S&Ls) Adj. R^2 = .0221

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0117	.0071	1.636	.102
TYPE	-.0117	.0090	-1.295	.195
K	-.0118	.0132	-.898	.369
HHI	-.0001	.0022	-.009	.992
SIZE	.0001	.0004	.278	.781
TYPE*SIZE	.0009	.0005	1.876	.061

[1] See Table A1 for variable definitions.

Table F6: FIXED: Residential Credit Unions

$$FIXED = \beta_0 + \beta_1 (TYPE) + \beta_2 (K) + \beta_3 (HHI) + \beta_4 (SIZE) + \beta_5 (TYPE*SIZE) + \varepsilon$$

Panel A: 1993 (123 Credit Unions, 186 Mutual S&Ls) Adj. $R^2 = .2058$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0290	.0114	2.546	.011
TYPE	-.0250	.0254	-.982	.326
K	-.0355	.0280	-1.266	.205
HHI	-.0075	.0086	-.868	.386
SIZE	-.0007	.0006	-1.293	.196
TYPE*SIZE	.0022	.0014	1.501	.133

Panel B: 1994 (108 Credit Unions, 191 Mutual S&Ls) Adj. $R^2 = .2073$

Variable[1]	Parameter Estimate	Standard Error	t-Statistic	p-value
Intercept	.0376	.0113	3.345	.001
TYPE	-.0791	.0233	-3.387	.001
K	-.0413	.0189	-2.190	.028
HHI	-.0050	.0050	-1.001	.317
SIZE	-.0011	.0005	-2.024	.043
TYPE*SIZE	.0052	.0013	3.891	.001

[1] See Table A1 for variable definitions.

APPENDIX G:

INTERPRETATION OF INTERACTION TERMS

Interpretation of Interaction Terms

Interaction terms are included in this study to determine the effects of institutional type across levels of the dependent and independent variables. For instance, consider the following equation:

$$NIM = \beta_0 + \beta_1(TYPE) + \beta_2(TYPE*TPT) + \beta_3(TYPE*OPERATING) + \beta_4(TPT) + \beta_5(OPERATING) + \varepsilon \quad (1)$$

Taking the partial derivative of equation (1) with respect to TYPE yields:

$$\frac{\partial NIM}{\partial TYPE} = \beta_1 + \beta_2 TPT + \beta_3 OPERATING \quad (2)$$

In equation (2), β_1 represents the fundamental difference in NIM between credit unions and mutual S&Ls. If β_1 is positive and significant, NIM is higher, on average, for credit unions than for mutual S&Ls. However, the sign on the parameter estimate says nothing about results over ranges of NIM. However, β_2 and β_3 , the estimates on the interaction terms, do give information on what happens to NIM at levels of the independent variables. These betas represent the difference in slopes for the credit union and the mutual S&L equation. A positive parameter estimate on β_2 indicates that NIM either (1) increases at a faster rate for credit unions than for mutual S&Ls as TPT increases or (2) decreases at a slower rate for credit unions than for mutual S&Ls as TPT

decreases. For example, assume that both β_1 and β_2 are positive. At TPT level T_1 for both credit unions and mutual S&Ls, credit unions will have a greater NIM than do mutual S&Ls. At TPT level T_2, again the credit unions will have a greater NIM than do mutual S&Ls but the spread is larger than at T_1.

Conversely, a negative parameter estimate on β_2 indicates that NIM either (1) increases at a slower rate for credit unions than for mutual S&Ls as TPT increases or (2) decreases at a faster rate for credit unions than for mutual S&Ls as TPT decreases. A similar interpretation of the β_3 parameter estimate can be made with respect to the OPERATING variable.

VITA

Yvonne Hinson Stewart was born Yvonne Leigh Hinson on April 13, 1963 in Ridgewood, New Jersey, to Dolan and Moretha Hinson. She grew up in Charlotte, North Carolina where she graduated from Garinger High School in June 1981. That same year Yvonne enrolled at the University of North Carolina - Charlotte where she received a Bachelor of Science degree in Accounting in May 1986. After graduation she worked for Belk Brothers Department Stores in Charlotte, North Carolina, and Webster, Rogers, West, Berry and Grady, an accounting firm in Florence, South Carolina, before returning to the University of North Carolina - Charlotte in August 1988. She received a Master of Business Administration degree in May 1990. Yvonne worked with Arthur Andersen & Company, S. C. in Charlotte, North Carolina from 1989 to 1992.

In August 1992, Yvonne entered the Graduate School at the University of Tennessee, Knoxville (UTK). She obtained the Doctor of Philosophy degree in business administration with a concentration in accounting in August 1997. While attending UTK, Yvonne met her husband, David Bruce Stewart. Yvonne and David were married in May 1994.

Yvonne became a Certified Public Accountant in 1992. She is a member of the AICPA, the North Carolina Association of CPAs, the American Accounting Association, and the American Taxation Association. She accepted an Assistant Professor position with Wake Forest University in Winston-Salem, North Carolina beginning August 1997.