

Frame, W. Scott; Karels, Gordon V.; McClatchey, Christine

Working Paper

The effect of the common bond and membership expansion on credit union risk

Working Paper, No. 2001-10

Provided in Cooperation with:

Federal Reserve Bank of Atlanta

Suggested Citation: Frame, W. Scott; Karels, Gordon V.; McClatchey, Christine (2001) : The effect of the common bond and membership expansion on credit union risk, Working Paper, No. 2001-10, Federal Reserve Bank of Atlanta, Atlanta, GA

This Version is available at:

<https://hdl.handle.net/10419/100938>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.



FEDERAL
RESERVE
BANK
of ATLANTA

**The Effect of the Common Bond and Membership Expansion
on Credit Union Risk**

W. Scott Frame, Gordon V. Karels, and Christine McClatchey

Working Paper 2001-10
April 2001

Working Paper Series

The Effect of the Common Bond and Membership Expansion on Credit Union Risk

W. Scott Frame, Federal Reserve Bank of Atlanta
Gordon V. Karels, University of Nebraska
Christine McClatchey, University of Northern Colorado

Abstract: This paper examines differences in institutional risk profiles based on credit union membership type and membership expansion via “select employee groups,” or SEGs, which are now expressly allowed by the Credit Union Membership Access Act of 1998. A cross-sectional statistical model is specified that examines risk variation relative to the type of common bond and the breadth of the credit union’s membership. In findings that are consistent with earlier research, the authors document that occupationally based credit unions have a unique risk profile relative to other common bonds. This profile includes a greater exposure to concentration risk, which is hedged by holding greater proportions of capital.

The authors also examine the subsample of Single-Bond occupational credit unions and those Multi-Bond credit unions with primarily occupational group members. They find that the presence of SEGs is negatively related to capital ratios and positively related to loan-to-share ratios relative to the Single-Bond occupational credit unions. The use of survey data documenting the number of SEGs confirms that, as more SEGs are added, credit unions tend to increase their loan-to-share ratios and decrease their capital ratios. However, the number of SEGs and the proportion of loan delinquencies are found to be positively related, suggesting that the informational advantages associated with the common bond become diluted as new groups are added. Overall, the authors conclude that there are material benefits of credit union membership diversification and that these benefits derive from expanded investment opportunities and reduced concentration risk.

JEL classification: G21, G28

Key words: credit unions, common bond, concentration risk

The authors are indebted to the Credit Union National Association for sharing their survey data on the number of select employee groups at individual credit unions. They also thank Sam Allgood, Brian Tishuk, seminar participants at the 1999 Financial Management Association meetings, and two anonymous referees for helpful comments. The views expressed here are the authors’ and not necessarily those of the Federal Reserve Bank of Atlanta or the Federal Reserve System. Any remaining errors are the authors’ responsibility.

Please address questions regarding content to W. Scott Frame, Senior Economist, Research Department, Federal Reserve Bank of Atlanta, 104 Marietta Street, N.W., Atlanta, Georgia 30303-2713, 404-521-8783, scott.frame@atl.frb.org; Gordon V. Karels, Nebraska Bankers Association College Professor of Banking, Finance Department, University of Nebraska, Lincoln, Nebraska 68599-0405, 402-472-3860, gkarels1@unl.edu; or Christine McClatchey, Finance Department, Monfort College of Business, University of Northern Colorado, Greeley, Colorado, 80639, 970-351-1248, christine.mcclatchey@unco.edu.

The full text of Federal Reserve Bank of Atlanta working papers, including revised versions, is available on the Atlanta Fed’s Web site at http://www.frbatlanta.org/publica/work_papers/index.html. To receive notification about new papers, please use the on-line publications order form, or contact the Public Affairs Department, Federal Reserve Bank of Atlanta, 104 Marietta Street, N.W., Atlanta, Georgia 30303-2713, 404-521-8020.

The Effect of the Common Bond and Membership Expansion on Credit Union Risk

1. Introduction

Credit unions are cooperative, not-for-profit depository institutions that serve a defined field-of-membership. Furthermore, federal credit union membership is limited to “individuals sharing a common bond of occupation, association, or geographic area.”¹ Beginning in 1982, the National Credit Union Administration (NCUA) interpreted this common bond requirement in such a way as to allow certain types of credit unions to add multiple groups referred to as “select employee groups,” or SEGs.² Ultimately, commercial banking interests successfully challenged the NCUA’s interpretation of the common bond requirement culminating with a Supreme Court ruling against the agency.³ This decision, in turn, led to the passage of the Credit Union Membership Access Act (1998), which expressly allowed for the addition of multiple groups to a credit union’s field-of-membership.⁴

Credit unions’ cooperative structure, coupled with their federal tax-exempt status, allow them to offer attractive deposit and loan pricing to their retail-oriented clientele. For this reason, trade associations representing community banks and thrifts have traditionally opposed credit union expansion.⁵ Some federal credit unions have used SEGs to significantly expand their operations in recent years. For example, AT&T Federal Credit Union, the subject of the

¹ Federal Credit Union Act, § 109, 12 U.S.C. § 1759 (1982), *amended by* Credit Union Membership Access Act, Pub. L. No. 105-219, § 101, 112 Stat. 913, 914-17 (1998) (expressly permitting a federal credit union’s field of membership to consist of multiple common bonds under certain conditions).

² Interpretive Ruling and Policy Statement (IRPS) 82-1, 47 Fed. Reg. 16775 (Apr. 20, 1982) authorized federal credit unions to serve multiple occupational groups, provided that each has its own common bond. IRPS 82-3, 47 Fed. Reg. 26808 (Jun. 22, 1982) allowed federal credit unions to add associational as well as occupational groups to their field of membership, so long as each group had its own common bond and was within a well-defined area near the credit union’s office.

³ NCUA v. First National Bank and Trust Co., 522 U.S. 479 (1998) (holding that the Federal Credit Union Act requires all members of a credit union to share a single common bond).

⁴ *See, supra* note 1.

⁵ Srinivasan and King (1998) provide a recent summary of several community bank versus credit union issues.

aforementioned legal battle, added 150 SEGs that accounted for 65 percent of its membership.⁶ Furthermore, while the NCUA's policy was being contested, many federal credit unions changed their charter in order to become geographically based, or residential credit unions, which have a customer base similar to that of a community bank or thrift.

It is widely accepted that the NCUA's support of membership expansion for occupational credit unions in the early 1980's grew out of concern about portfolio concentration risk. That is, a lack of diversification in the customer base (due to restrictive common bond requirements) also leads to a lack of diversification on the balance sheet. Empirical evidence supports, to some degree, the notion that concentration risk is an issue for occupational credit unions. Indeed, both Kohers (1986) and Kohers and Mullis (1986) find that occupational credit unions with sponsors operating in unstable business cycle environments experience higher loan delinquency rates and maintain more liquidity. However, Patin and McNeil (1992) find no difference in loan delinquency rates between Texas credit unions and those operating elsewhere during the "Oil Patch" crisis.

This paper re-examines the issue of concentration risk in occupational credit unions using a comprehensive data set for all U.S. credit unions operating as of year-end 1997. First, we update prior research that documents variation in credit union risk by membership bond, focusing exclusively on single common bond institutions. Second, we look at variation in risk among occupational credit unions conditional on their sponsor categories and whether they have added SEGs. Lastly, using a limited survey sample, we test whether the number of SEGs affects our risk measures. Our results provide direct evidence of the benefits of credit union membership diversification.

2. Background

⁶ The addition of SEGs has the potential to significantly increase the number of credit union members. For example, 1.5 million new potential credit union members were added through 16,290 SEGs by 1,431 institutions during 2000. (www.cuna.org/data/newsow/00/departments/washington_010600). Adding SEGs can be a relatively simple process and an expedited process exists for potential groups of less than 500 members. The policies for adding SEGs can be found on the NCUA website (www.ncua.gov) in Interpretive Ruling and Policy Statement (IRPS) 99-1 and IRPS 00-01.

U.S. Treasury (1997) outlines five characteristics that distinguish credit unions from banks and thrifts. First, credit unions are member-owned, member-directed cooperatives with each member having one vote.⁷ Second, credit unions rely on unpaid, volunteer boards of directors elected by (and drawn from) each institution's membership. Third, credit unions do not operate for profit. Rather, they return most earnings to their members through either reduced fees, lower interest rates on loans, or higher interest rates on deposits⁸. Fourth, credit unions have a public purpose as, according to the Federal Credit Union Act, they were established for "promoting thrift among members and creating a source of credit for provident or productive purposes."⁹ Lastly, credit unions have certain limitations on their membership based on an affinity among members – a so-called "common bond."

Prior to 1982, membership in federal credit unions was limited to groups having a common bond of occupation, association, or geographic area. Occupational credit unions serve individuals sharing a common employer or workplace. Associational credit unions may include members of a religious congregation, a fraternal organization, or a civic group. Residential or community credit unions may include anyone who lives, works, attends school in, or worships in a single neighborhood, city, county, or metropolitan area.¹⁰ Unlike banks and thrifts, a credit union's survival is often closely linked to the viability of its sponsoring firm, association, or community (U.S. Treasury, 1997). Further, membership restrictions constrain the investment opportunity set available to credit union managers.

⁷ The voting structure associated with credit union ownership is distinct from that of mutual thrifts because the latter attributes votes according to the level of deposits. Of course, the fact that credit unions are member-owned and member-directed does not necessarily imply they are member-controlled because of the extreme diffusion of voting rights.

⁸ While credit unions do not operate for profit, they are profitable financial institutions. Kaushik and Lopez (1996) document that credit unions were at least as profitable as commercial banks and savings banks over the 1989-1992 period. Since then, however, credit unions have generally had lower profitability figures than commercial and savings banks (U.S. Treasury, 2001).

⁹ Federal Credit Union Act § 101(1), 12 U.S.C. § 1752 (1982) (defining the term, "federal credit union").

¹⁰ Federally chartered residential credit unions may also serve businesses and other organizations within the geographical boundary. See Interpretive Ruling and Policy Statement (IRPS) 99-1.

In 1982, the NCUA reinterpreted the “common bond” requirement as allowing occupationally and associationally based credit unions to add SEGs provided each had its own common bond. This policy arose in response to a large number of credit union failures at that time, which stemmed from associated business failures.¹¹ Over time, many credit unions used this regulatory ruling as an opportunity to diversify their membership and expand their operations.¹² This growth, in turn, drew the ire of commercial banking interests, which subsequently sued the NCUA. This legal challenge culminated in a March 1998 ruling by the U.S. Supreme Court, which stated that the plaintiff banks had “standing” to challenge the regulator’s flawed statutory interpretation of the common bond requirement. However, the banker’s victory was short-lived as in August 1998, President Clinton signed the Credit Union Membership Access Act that (among other things) expressly allowed for the addition of multiple groups to a credit union’s field of membership.¹³

Since 1998, the NCUA has delineated credit union common bond types by whether the institution has a single common bond (Single-Bond) or multiple common bonds (Multi-Bond). Single-Bond credit unions are further segmented as occupational, associational, residential, or “other.”¹⁴ Single-Bond occupational credit unions are the most common type of credit union

¹¹ The recession of the early 1980's caused thousands of firms to close or relocate. Credit unions associated with such firms had limited memberships and subsequently experienced severe solvency-related problems. According to Credit Union National Association (1998), there were some 500 federal credit union failures or liquidations in 1981 alone.

¹² Credit Union National Association (1998) reports that over 3,600 federal and 1,700 state credit unions have added SEGs since 1982.

¹³ *See, supra* note 1. The Act also addressed the regulation of insured credit unions by, for example: (1) requiring large insured credit unions to obtain annual audits by an independent certified public accountant or licensed public accountant (§ 201(a)); (2) establishing procedures for insured credit unions converting to a mutual savings bank or mutual savings association (§ 202); (3) limiting the amount of member business loans originated by insured credit unions (§ 203); (4) establishing capital standards for insured credit unions (§ 301); and (5) addressing the liquidity needs of insured credit unions (§ 303).

¹⁴ The NCUA definitions of credit union types can be found at www.ncua.gov/ref/letters/-99-fcu-02. Common bond types are reported by the individual credit unions on their call report. Those reporting “other” may have a unique membership that was once allowed under state or federal chartering guidelines or they may have simply reported incorrectly.

accounting for nearly 40 percent of all institutions and holding almost 25 percent of the industry's total assets. Single-Bond associational credit unions are less pervasive, accounting for only about 10 percent of credit union charters, and 2.5 percent of total industry assets. Single-Bond residential and other credit unions each comprise approximately 8 percent of all credit unions. Multi-Bond credit unions are institutions that were originally organized around a single occupational or associational group, but have since added SEGs. By 1997, Multi-Bond credit unions accounted for 37 percent of all institutions and controlled nearly 60 percent of the industry's total assets.

From a public policy perspective, legislative intervention into the federal credit union membership issue sought to balance competing issues. First, well-defined (and meaningful) field-of-membership restrictions are a distinguishing characteristic of credit unions. Second (and conversely), these restrictions tend to create significant portfolio concentration risks. This is especially true for occupationally based credit unions, which rely on the continued viability of a single sponsoring firm. Third, this concentration risk has important policy implications because of the nature of deposit insurance for credit unions. Credit unions essentially cross-insure one another through insurance assessments held as deposits at the National Credit Union Share Insurance Fund (Kane and Hendershott, 1996 and Boldin, Leggett and Strand, 1998). If those deposits are not sufficient to meet industry needs, credit unions are assessed greater amounts. Hence, measures to reduce risk concentration are important at both the institution and industry levels.

The extant literature generally supports the notion that credit union membership type influences credit union operating behavior and performance.¹⁵ For the most part, these studies employ limited samples, suffer from methodological limitations or are relatively dated. However, two more recent lines of inquiry do not suffer from these deficiencies. First, Kohers (1986) and Kohers and Mullis (1986) find that occupational credit unions operating in an

¹⁵ See Flannery (1974); Black and Schweitzer (1984); Keating and Keating (1985, 1992); and Bundt, Chiesa, and Keating (1989).

unstable (pro-cyclical) economic environment experience lower profitability, exhibit higher delinquency rates, have a larger need for loan loss provisions, and maintain a greater degree of liquidity than their counterparts operating in a stable (business cycle neutral) environment. Second, Fried, Lovell, and Eeckaut (1993) find that productive efficiency (as measured by a credit union's ability to provide as many services as possible for a given level of resources) is the highest for associational credit unions and lowest for those with a residential common bond.

Since 1982, financial innovation and advances in information technology have led to deeper secondary markets for consumer credit and improved financial risk management. Thus, the degree to which occupational credit unions are riskier than other credit unions deserves a fresh look. We do this by examining variation in credit union liquidity, capital ratios, loan delinquencies, and income variability by way of cross-sectional regressions that hold a number of factors fixed.

3. Hypothesis Testing

In order to test whether various measures of credit union risk are influenced by membership type we begin by analyzing variations in risk by common bond type for all Single-Bond credit unions. We then turn our attention to Single-Bond and Multi-Bond occupational credit unions in order to uncover the general impact of SEGs on specified risk measures. Finally, using a sub-sample of Multi-Bond credit unions that originally had occupational common bonds, we analyze variation in risk conditional on the number of SEGs the credit union has added.

To test for the impact of credit union membership type on institutional risk profiles, we utilized Single-Bond credit unions operating as of year-end 1997. Our statistical model specifies credit union risk as a function of certain institution-specific and economic environment variables as defined below.

$RISK = f(\text{LOG OF TOTAL ASSETS, LOG OF AGE, FEDERAL CHARTER, NONMSA, BANKDEL, DENOVO, REAL ESTATE LOANS, UNSECURED LOANS, AUTO LOANS, MEMBERSHIP})$

where:

RISK = LIQUIDITY, CAPITAL, DELINQUENCY and STD DEV ROA defined as follows:

| | |
|--------------------|--|
| LIQUIDITY | = Total Loans / Total Shares, |
| CAPITAL | = Net Worth / Total Assets, |
| DELINQUENCY | = Delinquent Loans / Total Loans, |
| STD DEV ROA | = The standard deviation of the annual return on assets for the previous five years. |

The independent variables in our model are defined as:

| | |
|----------------------------|--|
| LOG OF TOTAL ASSETS | = the natural log of total assets in millions of dollars, |
| LOG OF AGE | = the natural log of the age of the institution, |
| FEDERAL CHARTER | = 1 if the credit union has a federal charter, = 0 otherwise, |
| NONMSA | = 1 if the credit union is located outside of a metropolitan statistical area, = 0 otherwise, |
| DENOVO | = 1 if the credit union was newly chartered during 1994-97, = 0 otherwise, |
| BANKDEL | = the ratio of commercial delinquent bank loans to total commercial bank loans in the state where the credit union is located, |
| REAL ESTATE LOANS | = Real Estate Loans / Total Loans, |
| UNSECURED LOANS | = Unsecured Loans / Total Loans, |
| AUTO LOANS | = Automobile Loans / Total Loans, |

The variable **MEMBERSHIP** indicates a credit union's membership bond type as follows:

| | |
|----------------------|--|
| ASSOCIATIONAL | = 1 if membership is of the single-bond associational type, |
| RESIDENTIAL | = 1 if membership is of the single-bond residential type, |
| OTHER | = 1 if membership is any single-bond type other than occupational, associational or residential. = 0 if membership is of the single-bond occupational type. |

Single-Bond occupational credit unions are the excluded group. All equations are estimated by ordinary least squares (OLS) using data from the December 1997 Call Report provided by Sheshunoff Information Service's *BankSearch* database.

The risk variables are chosen for the following reasons. First, a credit union's loan-to-share ratio may serve as a proxy for an institution's liquidity risk, or the risk arising from funding illiquid loans with liquid share deposits. Thus, the higher the loan-to-share ratio the greater the liquidity risk. Second, capital ratios may be used as a proxy for the underlying risk profile of the credit union. Such risks include credit risk, interest rate risk, liquidity risk, concentration risk, and management and operations risk. Credit unions with riskier assets will tend to hold more capital, therefore we expect a positive relationship between credit union capital and risk, all things being equal.¹⁶ Third, loan delinquencies are related to the degree of informational uncertainty when underwriting loans as well as the credit union's ability to monitor loans.¹⁷ Thus, we expect that the tighter (i.e., more homogeneous) the membership bond, the fewer delinquencies are likely to occur. However, during difficult economic conditions, the concentration risk associated with tight membership bonds may offset any informational advantages. Fourth, because the common bond restricts credit union expansion, the volatility of income should be affected by the type of membership bond and the ability to add SEGs. We use the standard deviation of ROA as the measure of income volatility and expect to observe lower volatility in credit unions that have expanded their field of membership.

Following the literature, our statistical model of credit union risk measures also includes variables related to: (1) size, age, charter; (2) portfolio mix; and (3) local economic conditions. We account for credit union size (LOG OF TOTAL ASSETS) using the natural log of the dollar value of total assets measured in millions of dollars. Larger credit unions tend to be more diversified and employ more professional personnel, thus we expect these institutions will hold

¹⁶Alternatively, one may consider holding less capital to be riskier; perhaps due to the presence of moral hazard arising from deposit insurance. However, Karels and McClatchey (1999) report that the introduction of deposit insurance did not influence the risk-taking behavior of credit unions.

¹⁷ We used the loan delinquency rate rather than the charge-off rate because credit union accounting practices allow non-performing loans to remain on the books for long periods of time. In 1997, for instance, almost 10 percent of delinquencies were more than one year past due. Moreover, discussions with regulatory authorities suggest that credit union charge-off rules are not uniformly applied. This may ultimately have the effect of understating charge-offs for credit unions operating in certain states or regions. Nevertheless, we reexamined our results using the ratio of net charge-offs to total loans as well.

less capital and have relatively fewer delinquencies. The natural logarithm of credit union age (LOG OF AGE) is included because newer institutions may underwrite relatively fewer loans and have relatively higher delinquencies due to inexperienced underwriting – perhaps leading to greater income variability. We also expect younger credit unions to have significantly lower net worth as capital is generated exclusively through retained earnings. We also included a dummy variable for newly chartered credit unions (DENOVO) to account for their fragility. Another dummy variable, FEDERAL CHARTER, was included to account for potential variation in regulatory treatment between federal and state authorities.

To capture the risk inherent in the asset portfolio, the percentage of unsecured lending (UNSECURED), automobile lending (AUTO), and first mortgage lending (REAL ESTATE) relative to total loans was included. The relative volume of these three types of lending should be positively related to credit union loan-to-share ratios. Each type of credit presents unique risks that may influence the level of capital held by credit unions as well as the rate of delinquencies. For example, unsecured lending entails a greater risk of credit loss relative to automobile or mortgage lending, due to the lack of marketable collateral. Mortgage loans often result in more interest rate risk because the expected life of the loan is significantly longer than that of unsecured or automobile lending. Mortgage loans also entail less credit risk than other types of loans because of common underwriting standards and relatively greater equity participation by the borrower. Automobile loans represent the predominate class of credit union lending.

Finally, we included two variables to control for the economic environment in which the credit union operates. The first is a dummy variable (NONMSA) that indicates a credit union operates outside of a metropolitan statistical area. Credit unions operating in non-metropolitan areas are less likely to have lending opportunities but may be more familiar with borrowing customers. The other variable is the ratio of delinquent commercial bank loans to total commercial bank loans in the state in which the credit union operates (BANKDEL). Credit unions operating in states that have high levels of delinquent bank loans would likely also have

higher risk measures. It is important that we distinguish this from the credit union-specific risk measures.

Table 1 presents summary statistics for each of the explanatory variables for all U.S. credit unions operating as of December 31, 1997. Further, we have delineated the data by membership bond category. Overall, we find that the average credit union has existed approximately 43 years and controls \$31 million in total assets. Some 62 percent of credit unions operate with a federal charter while only 20 percent are located in non-metropolitan areas. The three loan categories (UNSECURED, AUTO, and REAL ESTATE) account for over 80 percent of credit union loans. Just over one-half of all credit union loans finance automobile purchases.

Comparing credit unions across common bond types, we find the following. First, Multi-Bond credit unions are larger (\$49 million in average total assets) than the average credit union. Multi-Bond credit unions are also more likely to be federally chartered (83 percent) and headquartered in metropolitan areas (83 percent are located in a MSA). The loan portfolio of Multi-Bond credit unions contains a smaller proportion of unsecured loans and a larger proportion of real estate loans than the average credit union.

As expected, Single-Bond credit unions tend to be smaller than Multi-Bond credit unions. Single-Bond residential credit unions are the largest of this group (\$35 million in total assets) and Single-Bond associational the smallest (\$8 million in total assets). Further, Single-Bond associational credit unions are the youngest (37 years old), are rarely located outside of a metropolitan area (only 10 percent operate outside of a MSA), and have the highest concentration of unsecured loans (34 percent of total assets) and smallest proportion of auto loans (40 percent of total assets). Residential credit unions have the highest average proportion of real estate loans (19 percent) and also have the highest proportion of institutions located in non-metropolitan areas (42 percent). Single-Bond occupational credit unions have the smallest average real estate portfolio (five percent of total loans). The category of Single-Bond other credit unions has characteristics similar to the average credit union with the exception of charter type. Only seven percent of these credit unions have a federal charter.

[Table 1 about here]

3.1. *Are occupationally based credit union's riskier than other credit unions?*

Our first set of hypotheses tests examine the effect of credit union common bond type (relative to occupational credit unions) on various risk measures for Single-Bond credit unions. In other words, we are interested in estimating the marginal effect of associational, residential and other credit union's membership type on various risk measures. We posit that occupational credit unions: (1) have higher loan-to-share ratios than other types of credit unions because the bulk of their members are employed; (2) hold more capital due to the presence of concentration risk; (3) experience relatively fewer delinquencies because of the informational advantages stemming from their tighter (i.e., more homogeneous) membership bond; and (4) have lower income variability during the robust economic period under study.¹⁸

The empirical results presented in Table 2 demonstrate that occupational credit unions do have a distinct risk profile. First, these institutions have a loan-to-share ratio that is 11.7 basis points higher than associational credit unions, all things being equal. Presumably, this stems from the fact that most members of occupational credit unions are employed and are, therefore, creditworthy. Of note, however, is that liquidity levels of occupational credit unions are not statistically different from those for the residential or the other category of membership types. Second, occupational credit unions have capital ratios that are about 1.6 basis points higher than other credit unions and approximately 2.8 basis points higher than either associational or residential credit unions. This suggests that occupational credit unions hold additional reserves in awareness of their potential concentration risk. Third, delinquency rates for occupational credit unions are significantly lower than those for residential, associational, and other

¹⁸ However, during difficult economic conditions, the concentration risk associated with tight membership bonds may offset any informational advantages. For our sample using 1997 data, we would expect that occupational credit unions have fewer delinquencies *ceteris paribus* than other types of credit unions due to the robust macroeconomic environment.

institutions: thereby suggesting their informational advantages in underwriting and monitoring loans.¹⁹ Delinquency rates are the highest for associational credit unions. Lastly, the income variability of occupational credit unions is significantly lower than that for associational or residential credit unions but not different from the other category.

These inferences are robust to variation in credit union size, age, charter, and portfolio mix. Overall, these results indicate that: (1) occupational credit unions are potentially exposed to concentration risk which they mitigate by holding additional capital; (2) associational credit unions originate significantly fewer loans, suffer significantly higher delinquency rates, hold less capital, and experience greater income variability than occupational credit unions; and (3) residential credit unions hold less capital, have higher income variability, and have higher delinquency rates than occupational credit unions.²⁰

[Table 2 about here]

Several other interesting results are indicated in Table 2. First, larger credit unions (as measured by total assets) tend to be more liquid, hold less capital, experience fewer loan delinquencies and have lower income variability than smaller institutions. These findings may reflect the fact that larger credit unions are more likely to employ professional management, thus they have better underwriting skills. We also find that federally-chartered credit unions are more liquid, hold more capital, have higher delinquency rates and have lower income variability than their state-chartered counterparts. Consistent with our expectations, credit unions holding more unsecured loans have higher delinquency levels and greater income variability. Credit

¹⁹ Looking at charge-off rates, the coefficient on the residential dummy variable remains the same (positive and significant), but the coefficient on the associational and other dummy variables turn insignificant (both were positive and significant in the delinquency regression).

²⁰ We also conducted the same tests using the entire 1997 sample, including Multi-Bond credit unions. We again used the occupational category as the excluded group. The qualitative results were the same. Single-Bond occupational credit unions had significantly lower loan-to-share ratios, higher capital ratios and lower delinquency ratios relative to Multi-Bond credit unions. No significant difference was observed for income variability.

unions holding more auto loans have less liquidity and capital along with fewer delinquencies and lower income variability.

We also find that older credit unions are less liquid, have reduced income variability, and hold more capital. The latter result is consistent with the fact that credit unions are mutually-owned and must build capital by retaining earnings over time. *De novo* credit unions have less capital, exhibit fewer delinquencies and have relatively high income variability. Credit unions in non-metropolitan areas are more liquid, hold more capital, have lower delinquencies, and have higher income variability. Surprisingly, the level of commercial bank delinquencies for the state in which the credit union operated did not predict delinquency levels for credit unions. In fact, the higher the level of commercial bank delinquencies in a particular state, the lower the level of delinquencies and income variability for credit unions in that state.

3.2. *Is there variation in risk among occupational credit unions?*

We next focus on the sub-sample of 7,735 occupational credit unions. Specifically, we examine the 4,221 Single-Bond occupational credit unions and those 3,514 Multi-Bond credit unions that identify their primary membership as an occupational group. Once again, we relate our proxies for credit union risk (LIQUIDITY, CAPITAL, DELINQUENCY and STD DEV ROA) to categorical membership variables as well as the nine variables (described previously) that account for variation in credit union size, age, charter, portfolio mix and economic conditions. In this case, the membership variable is defined as follows.

| | |
|----------------------|--|
| EDUCATIONAL | = 1 if membership is of the Single-Bond educational type, |
| MANUFACTURING | =1 if membership is of the Single-Bond manufacturing type, |
| SERVICE | = 1 if membership is of the Single-Bond service type, |
| MILITARY | = 1 if membership is of the Single-Bond military type, |
| GOVERNMENT | =1 if membership is of the Single-Bond government type, |

= 0 if membership is of the Multi-Bond type.
These were originally classified as an
occupational credit union but had since added
SEGs.

The control group in this specification is the Multi-Bond occupational group, which accounts for slightly over 45 percent of all occupational credit unions in number. Single-Bond manufacturing credit unions represent one-fifth of these institutions, while service-oriented (14 percent), government employee (13 percent), educational (7 percent), and military (0.6 percent) account for the other two-thirds. In light of the findings of Kohers and Mullis (1986), we expect manufacturing- and service-oriented credit unions exhibit the greatest risk.

Table 3 provides summary statistics for our sample of Single-Bond and Multi-Bond occupational credit unions operating as of December 1997. The figures on credit union total assets, age, charter, and portfolio mix generally mimic those provided for all credit unions in Table 1. Comparing across the various types of occupational credit unions, we see that size is the distinguishing characteristic. For example, military credit unions are more than six times as large as the average occupational credit union, while manufacturing credit unions are only one-third of the average size. Multi-Bond credit unions are the next largest type – about fifty percent larger than the average occupational credit union. There do not appear to be many other noticeable differences across occupational credit unions. Military credit unions do have a much lower proportion of loans-to-shares than any other type of occupational credit union and Multi-Bond credit unions appear to have a larger proportion of real estate loans as compared to other categories of occupational credit unions.

[Table 3 about here]

We expect that the introduction of SEGs should serve to mitigate concentration risk to some degree, but at the same time reduce a portion of the informational advantages associated with a tight membership bond. As a result, the effect of SEGs on occupational credit unions'

loan-to-share ratios, delinquency ratios, and income variability is ambiguous, *a priori*. We do expect the introduction of SEGs to be negatively related to credit union capital ratios due to a reduction in concentration risk.

The results of our estimation are reported in Table 4. With a few exceptions, the coefficient estimates on the size, age, charter, portfolio mix and economic conditions variables were similar in sign, magnitude and significance level to those obtained for all Single-Bond credit unions in Table 2. A couple of differences are worth mentioning. First, for occupational credit unions, age is negatively and significantly related to liquidity where it was positive and significant in the Single-Bond estimation. Second, older occupational credit unions have significantly higher delinquency rates. This effect was insignificant in the regressions on Single-Bond credit unions. Lastly, the coefficients on the NONMSA and DENOVO in the liquidity regression were opposite in sign of those reported in the single-bond sample in Table 2.

The effect of occupational credit union membership bond on risk is relatively consistent. First the liquidity of Multi-Bond credit unions is lower than all Single-Bond occupational credit unions (educational, manufacturing, service, military, and government). This is consistent with Leggett and Stewart (1999) that note a credit union's non-core, or SEG, members are more likely to be borrowers than its core members. Second, Single-Bond manufacturing credit unions hold more capital and have higher income variability and higher delinquencies than Multi-Bond credit unions. The latter result is consistent with Kohers and Mullis (1986) who find that credit unions operating in unstable business cycle environments experience higher loan delinquency rates. Third, and also consistent with Kohers and Mullis, we find that government and educational Single-Bond credit unions have fewer loan delinquencies than Multi-Bond credit unions (both operating in stable business cycle environments). It may be that Multi-Bond credit unions lose

some of their informational advantages as they expand their membership base and are less familiar with the members in their select employee groups producing a higher delinquency rate. Although Single-Bond education and government credit unions have lower delinquency ratios relative to Multi-Bond credit unions (the educational group also has lower income variability), we find their capital ratios are the same or greater than Multi-Bond credit unions. This suggests government-related credit unions hold more capital in light of their potential concentration risk, despite their lower delinquency rates. Interestingly, Multi-Bond credit unions do not differ from Single-Bond military credit unions with respect to capital, delinquency, or income variability. Overall, the results point to benefits of membership diversification as the addition of SEGs appears to increase investment opportunities and reduce concentration risk.

[Table 4 about here.]

In order to examine the robustness of our results, we re-estimated the regressions reported in Tables 2 and 4 using data from year-end 1992 . During that year, the economy was in a minor recession that produced a very different operating environment for financial institutions than existed in 1997. While the 1992 results are not reported in the paper, they are quite similar across the two time periods. In the sample for all Single-Bond credit unions (Table 2), the membership bond coefficients that were significant in 1997 retained their sign and significance levels in 1992. In addition, the insignificant coefficients on residential and other membership bond in the 1997 liquidity equation were positive and significant in the 1992 time period. Thus, occupational credit unions reduced lending relatively more during the recessionary period more than residential and other credit unions.

The results for the sample of occupational credit unions (Table 4) also reflected stable

coefficients on the various occupational membership bonds across the two time periods. The only changes were (1) government-related credit unions had liquidity similar to Multi-Bond credit unions in 1992 (government institutions had more liquidity in 1997); and (2) service-related credit unions have more delinquencies than Multi-Bond credit unions in 1992 (indistinguishable in 1997).

The impact of bank delinquency rates was more noticeable in our 1992 results. While this coefficient was insignificant in the liquidity regressions across both samples (Single-Bond and occupational) in 1997 it was negative and significant in 1992. Thus, during the recessionary period, higher bank delinquency rates implied less lending by credit unions. We also obtained a positive and significant coefficient on the bank delinquency coefficient in the delinquency regressions (Single-Bond and occupational samples) for the 1992 time period (that coefficient was either negative or insignificant in the 1997 time period). This suggests that banks and credit unions were facing a common, exogenous macroeconomic shock at that time.

3.3. Does the number of SEGs affect credit union risk?

It's possible that the extent to which SEGs alter credit union risk profiles depends on the number of SEGs added to the credit union's membership base. Indeed, simply distinguishing Single-Bond and Multi-Bond credit unions may not totally capture the relationship. Our previous approach (above) was necessary because the credit union call report does not include the total number of SEGs added by Multi-Bond credit unions. However, Credit Union National Association's annual survey of credit unions does solicit such information. We used this data to examine a sub-sample of 1,186 Multi-Bond credit unions that identified their primary membership as "occupational" for 1997. Of these 1,186 credit unions, 70 percent reported having fewer than 50 SEGs, while only three percent reported having more than 500 SEGs.

Following Gilley and Leone (1991), we first examined certain demographic

characteristics of the responding sample to determine if it was representative of all Multi-bond credit unions. We found statistically significant differences in the age, asset size, proportion of federally chartered credit unions, the proportion of credit unions in metropolitan statistical areas, and the proportion of *de novo* credit unions. These five variables were then used in Heckman's (1976) sample selection model to predict the probability of a credit union responding to the survey and in the creation of the Heckman's "lambda" for the second stage least squares regression. This second regression is the one of interest for purposes of testing the effect of the number of SEGs on credit union risk profiles.

The Heckman regression results are reported in Table 5. The risk measures, demographic variables, portfolio mix variables and local economic conditions variables are the same as those utilized in the two previous sets of regressions. The natural logarithm of the number of SEGs (LOG OF SEGS) is included in the second stage regressions to determine the marginal impact of an expanded membership base on the risk measures. A derived measure of Heckman's "lambda" is also included in each model.

[Table 5 about here.]

We have three key findings from this set of regressions. First, we find that a larger number of SEGs is associated with higher loan-to-share ratios. This is consistent with less balance sheet liquidity and greater investment opportunities. Second, the number of SEGs is negatively related to credit union capital ratios indicating the benefits of reducing concentration risk through membership diversification. Lastly, credit union delinquency ratios are positively related to the number of SEGs – suggesting that the informational advantages associated with the common bond become diluted as new groups are added. We do not find a statistically significant relationship between the number of SEGs and the liquidity measure and the variability of income. Further, Heckman’s “lambda” is statistically significant in the capital and delinquency regressions -- indicating the importance of accounting for response bias in these specifications.

4. Conclusions

Membership in federally-chartered credit unions is limited to “individuals sharing a common bond of occupation, association, or geographic area.” These membership limitations tend to create portfolio concentration risks as evidenced by the large number of credit union failures in the early 1980’s. The NCUA responded to this situation by allowing certain credit unions to expand their membership by including select employee groups. The 1998 Credit Union Membership Access Act explicitly allowed for expansion of the field of membership and hence the potential to mitigate this risk.

This research was concerned with documenting the unique risk profile of occupational credit unions and the degree to which SEGs have reduced credit union risk. Our various statistical tests uncovered the following.

First, occupational credit unions are potentially exposed to concentration risks, which they appear to account for by holding additional capital. Occupational credit unions also experience relatively fewer delinquencies, perhaps because their members are employed and they have informational advantages over other types of credit unions.

Second, Multi-Bond credit unions identifying themselves as primarily serving occupational members have higher loan-to-share ratios and hold less capital than Single-Bond occupational credit unions. This suggests that Multi-Bond institutions have greater investment opportunities and are subject to less membership concentration risk. Loan delinquencies at Multi-Bond credit unions are lower than that for Single-Bond occupational credit unions, but greater than that for Single-Bond educational and government credit unions. Multi-Bond credit unions also have significantly greater income variability than Single-Bond educational credit unions but significantly lower variability than Single-Bond manufacturing credit unions.

Third, using proprietary survey data with information on the number of SEGs affiliated with Multi-Bond, occupationally related credit unions, we found a negative relationship between the number of SEGs and capital ratios and a positive relationship with loan-to-share and delinquency ratios. These results indicate that as the number of SEGs increase, the credit union benefits from expanded investment opportunities and reduced concentration risk. However, the informational advantages arising from common bonds may become diluted.

References

- Black, Harold and Robert Schweitzer, 1984. The effect of common bond on credit union performance: The case of black-controlled credit unions, *The Review of Black Political Economy* 15, 89-99.
- Boldin, Robert J., Kenneth Leggett and Robert Strand, 1998. Credit union industry structure: An examination of potential risks, *Financial Services Review* 7, 207-215.
- Bundt, Thomas, Jeffrey Chiesa, and Barry Keating, 1989. Common bond type and credit union behavior, *Review of Social Economy* 47, 27-42.
- Flannery, Mark, 1974. An economic evaluation of credit unions in the United States. *Research Report Number 54*, Federal Reserve Bank of Boston.
- Fried, Harold, C.A. Knox Lovell and Philippe Vanden Eeckaut, 1993. Evaluating the performance of U.S. credit unions, *Journal of Banking and Finance* 17, 251-265.
- Gilley, Otis W. and Robert P. Leone, 1991. A two-stage imputation procedure for item nonresponse in surveys, *Journal of Business Research*, 22, 281-291.
- Heckman, James J., 1976. The common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimator for such models, *Annals of Economic and Social Measurement*, 5, 475-492.
- Kane, Edward J. and Robert Hendershott, 1996. The federal deposit insurance that didn't put a bite on U.S. taxpayers, *Journal of Banking and Finance*, 20, 1305-1328.
- Karels, Gordon and Christine McClatchey, 1999. Deposit insurance and risk-taking behavior in the credit union industry, *Journal of Banking and Finance* 23, 105-134.
- Kaushik, Surenda K. and Raymond H. Lopez, 1996. Profitability of credit unions, commercial banks and savings banks: A comparative analysis, *The American Economist* 40, 66-78.
- Keating, Barry and Maryann Keating, 1992. An empirical estimation of the degree of expense preference behavior between credit unions by common bond type, *Quarterly Review of Economics and Finance* 32, 71-84.
- Keating, Maryann and Barry Keating, 1989. Invidious competition or benevolence: Does not-for-profit status constrain the behavior of credit unions? *The Journal of Applied Business Research* 5, 49-55.
- Kohers, Theodor, 1986. Parent organization's activities as a cause for differential credit union

operating characteristics, *Southwest Journal of Business and Economics*, 4, 11-21.

Kohers, Theodor and David Mullis, 1986. The effects of parent company business on occupational credit union behavior, *Applied Economics* 18, 1311-1321.

Leggett, Keith J. and Yvonne H. Stewart, 1999. Multiple common bond credit unions and the allocation of benefits, *Journal of Economics and Finance* 23, 235-245.

Patin, Roy and Douglas McNeil, 1992. The safety of Texas credit unions: A comparison with other United States credit unions, *Southwest Journal of Business and Economics* 9, 7-12.

Srinivasan, Aruna and B. Frank King, 1998. Credit union issues, *Economic Review, Federal Reserve Bank of Atlanta* 3, 32-41.

U.S. Treasury, 1997. *Credit Unions*, (Government Printing Office, Washington, D.C.)

Table 1

Sample Statistics For All U.S. Credit Unions By Common Bond Type

Mean, standard deviation, minimum and maximum of the variables in our sample for all U.S. credit unions and for credit unions by type of common bond for fiscal year 1997. Source of the data is the 1997 Call and Income Reports provided by Sheshunoff Information Service's *BankSearch* database.

| | Mean | Std. Deviation | Maximum | Minimum |
|--|-------|----------------|----------|---------|
| TOTAL CREDIT UNIONS N = 11,235 | | | | |
| Total Assets (\$ mill) | 31.25 | 144.18 | 9709.17 | 0.01 |
| Age (years) | 42.53 | 14.51 | 89 | 1 |
| Charter Type (federal) | 0.62 | --- | --- | --- |
| Non-MSA | 0.20 | --- | --- | --- |
| DeNovo | 0.026 | --- | --- | --- |
| Unsecured Loans (%) | 24.10 | 21.75 | 100.00 | 0.00 |
| Auto Loans (%) | 50.65 | 22.61 | 100.00 | 0.00 |
| Real estate Loans (%) | 8.33 | 14.34 | 96.52 | 0.00 |
| Capital / Total Assets (%) | 13.58 | 6.29 | 100.00 | -20.34 |
| Total Loans / Total Shares (%) | 76.38 | 21.20 | 427.17 | 0.00 |
| Delinquent Loans / Total Loans (%) | 2.66 | 5.16 | 100.00 | 0.00 |
| Standard Deviation of ROA | 0.66 | 5.47 | 469.75 | 0.00 |
| | | | | |
| SINGLE BOND OCCUPATIONAL N = 4,221 | | | | |
| Total Assets (\$ mill) | 20.60 | 174.77 | 9,709.17 | 0.01 |
| Age (years) | 42.54 | 14.88 | 83 | 1 |
| Charter Type (federal) | 0.53 | --- | --- | --- |
| Non-MSA | 0.19 | --- | --- | --- |
| DeNovo | .019 | --- | --- | --- |
| Unsecured Loans (%) | 26.97 | 23.38 | 100.00 | 0.00 |
| Auto Loans (%) | 53.53 | 22.90 | 99.66 | 0.00 |
| Real Estate Loans (%) | 4.98 | 11.21 | 96.52 | 0.00 |
| Capital / Total Assets (%) | 15.28 | 6.90 | 100.00 | -6.19 |
| Total Loans / Total Shares (%) | 77.23 | 22.03 | 427.17 | 0.00 |
| Delinquent Loans / Total Loans (%) | 2.32 | 3.55 | 100.00 | 0.00 |
| Standard Deviation of ROA | 0.69 | 4.99 | 318.02 | 0.00 |
| | | | | |
| SINGLE BOND ASSOCIATIONAL N = 1,107 | | | | |
| Total Assets (\$ mill) | 7.94 | 35.87 | 642.57 | .002 |
| Age (years) | 36.54 | 14.24 | 76 | 1 |
| Charter Type (federal) | 0.67 | --- | --- | --- |
| Non-MSA | 0.10 | --- | --- | --- |
| DeNovo | .029 | --- | --- | --- |
| Unsecured Loans (%) | 33.61 | 35.10 | 100.00 | 0.00 |
| Auto Loans (%) | 39.56 | 30.99 | 100.00 | 0.00 |
| Real Estate Loans (%) | 7.38 | 17.79 | 95.99 | 0.00 |
| Capital / Total Assets (%) | 14.06 | 8.01 | 98.92 | -20.33 |
| Total Loans / Total Shares (%) | 63.03 | 29.05 | 272.00 | 0.00 |
| Delinquent Loans / Total Loans (%) | 7.58 | 11.89 | 100.00 | 0.00 |
| Standard Deviation of ROA | 1.40 | 14.26 | 469.75 | 0.00 |

Table 1 continued

| | Mean | Std. Deviation | Maximum | Minimum |
|---|-------|----------------|----------|---------|
| SINGLE BOND RESIDENTIAL N = 891 | | | | |
| Total Assets (\$ mill) | 34.54 | 65.23 | 628.32 | .003 |
| Age (years) | 45.03 | 16.16 | 89 | 1 |
| Charter Type (federal) | 0.53 | --- | --- | --- |
| Non-MSA | 0.42 | --- | --- | --- |
| DeNovo | 0.049 | --- | --- | --- |
| Unsecured Loans (%) | 17.09 | 19.27 | 100.00 | 0.00 |
| Auto Loans (%) | 42.78 | 22.14 | 100.00 | 0.00 |
| Real Estate Loans (%) | 18.80 | 20.01 | 88.77 | 0.00 |
| Capital / Total Assets (%) | 11.75 | 6.19 | 48.69 | -13.30 |
| Total Loans / Total Shares (%) | 77.16 | 20.59 | 194.68 | 0.00 |
| Delinquent Loans / Total Loans (%) | 2.89 | 5.43 | 88.89 | 0.00 |
| Standard Deviation of ROA | 0.61 | 0.92 | 10.52 | 0.00 |
| | | | | |
| SINGLE BOND OTHER N = 842 | | | | |
| Total Assets (\$ mill) | 22.03 | 62.86 | 834.11 | .077 |
| Age (years) | 44.71 | 14.98 | 76 | 1 |
| Charter Type (federal) | 0.07 | --- | --- | --- |
| Non-MSA | 0.32 | --- | --- | --- |
| DeNovo | 0.014 | --- | --- | --- |
| Unsecured Loans (%) | 17.58 | 16.96 | 100.00 | 0.00 |
| Auto Loans (%) | 58.42 | 21.63 | 100.00 | 0.00 |
| Real Estate Loans (%) | 6.27 | 11.81 | 68.22 | 0.00 |
| Capital / Total Assets (%) | 13.07 | 5.40 | 42.60 | -3.60 |
| Total Loans / Total Shares (%) | 81.10 | 19.42 | 162.33 | 0.00 |
| Delinquent Loans / Total Loans (%) | 2.01 | 3.24 | 47.24 | 0.00 |
| Standard Deviation of ROA | 0.58 | 1.65 | 44.22 | 0.00 |
| | | | | |
| MULTI-BOND N = 4174 | | | | |
| Total Assets (\$ mill) | 49.36 | 149.74 | 4,876.08 | .043 |
| Age (years) | 43.15 | 13.25 | 80 | 1 |
| Charter Type (federal) | 0.83 | --- | --- | --- |
| Non-MSA | 0.17 | --- | --- | --- |
| DeNovo | 0.029 | --- | --- | --- |
| Unsecured Loans (%) | 21.50 | 14.16 | 100.00 | 0.00 |
| Auto Loans (%) | 50.76 | 18.10 | 100.00 | 0.00 |
| Real Estate Loans (%) | 10.15 | 13.77 | 90.97 | 0.00 |
| Capital / Total Assets (%) | 12.22 | 4.65 | 50.97 | -7.05 |
| Total Loans / Total Shares (%) | 77.92 | 16.53 | 164.37 | 0.89 |
| Delinquent Loans / Total Loans (%) | 1.80 | 2.45 | 52.63 | 0.00 |
| Standard Deviation of ROA | 0.46 | 0.47 | 8.73 | 0.017 |

Table 2

OLS Regressions of the Impact of the Common Bond Type on Various Risk Measures for Single-Bond Credit Unions

Ordinary least squares regressions of selected risk measures on credit union demographic variables, portfolio mix variables, economic conditions and common bond type for all single-bond credit unions in 1997. The excluded bond type is the Single-Bond occupational credit union. Data is from the 1997 Call and Income Reports provided by Sheshunoff Information Service's *BankSearch* database.

| | LIQUIDITY | CAPITAL | DELINQUENCY | STD DEV ROA |
|------------------------|------------|------------|-------------|-------------|
| Variable | 0.741*** | 0.209*** | 0.124*** | 2.748*** |
| | (23.436) | (23.330) | (15.464) | (18.854) |
| LOG OF TOTAL ASSETS | -0.0091*** | -0.0131*** | -0.0103*** | -0.143*** |
| | (-4.921) | (-24.908) | (-21.823) | (-16.920) |
| LOG OF AGE | 0.0105* | 0.0183*** | -0.0001 | -0.164*** |
| | (1.862) | (11.430) | (-0.079) | (-6.168) |
| FEDERAL CHARTER | -0.0233*** | 0.0039** | 0.0040*** | -0.0513** |
| | (-4.094) | (2.445) | (2.799) | (-1.981) |
| NONMSA | 0.0529*** | 0.0044** | -0.0057*** | -0.0909*** |
| | (8.048) | (2.365) | (-3.447) | (-3.044) |
| BANKDEL | 0.356 | -0.366** | -0.299** | -4.535* |
| | (0.673) | (-2.443) | (-2.236) | (-1.886) |
| DENOVO | -0.0226 | -0.0222*** | -0.0084* | 0.292*** |
| | (-1.213) | (-4.204) | (-1.783) | (2.890) |
| REAL ESTATE LOANS | 0.123*** | 0.0188*** | -0.0021 | -0.159 |
| | (4.811) | (2.604) | (-0.318) | (-1.365) |
| UNSECURED LOANS | -0.0809*** | 0.0025 | 0.0100*** | 0.174** |
| | (-5.248) | (0.571) | (2.569) | (2.482) |
| AUTO LOANS | 0.146*** | -0.0222*** | -0.0238*** | -0.478*** |
| | (9.275) | (-4.974) | (-5.960) | (-6.646) |
| ASSOCIATIONAL | -0.117*** | -0.0286*** | 0.0354*** | 0.0596* |
| | (-14.640) | (-12.703) | (17.535) | (1.645) |
| RESIDENTIAL | -0.0088 | -0.0278*** | 0.0164*** | 0.156*** |
| | (-1.005) | (-11.248) | (7.410) | (3.912) |
| OTHER | 0.0092 | -0.0161*** | 0.0050** | -0.0025 |
| | (1.058) | (-6.509) | (2.255) | (-0.62) |
| Adjusted R-Square | 0.115 | 0.153 | 0.199 | 0.108 |
| Number of Observations | 7,036 | 7,036 | 7,036 | 6,987 |

T-statistics in parentheses.

*Statistically significant at the 10% level.

**Statistically significant at the 5% level.

***Statistically significant at the 1% level.

Table 3

Sample Statistics For All Occupational Credit Unions By Membership Type

Mean, standard deviation, minimum and maximum of the variables in our sample for all occupational credit unions and for different types of occupational credit unions for fiscal year 1997. Source of the data is the 1997 Call and Income Reports provided by Sheshunoff Information Service's *BankSearch* database.

| | Mean | Std. Deviation | Maximum | Minimum |
|---|-------|----------------|---------|---------|
| TOTAL OCCUPATIONAL CREDIT UNIONS N = 7,735 | | | | |
| Total Assets (\$ Millions) | 34.73 | 167.30 | 9,709 | 0.01 |
| Age (Years) | 42.98 | 14.15 | 83 | 1 |
| Charter (Federal) | 0.67 | --- | --- | --- |
| Non-MSA | 0.19 | --- | --- | --- |
| DeNovo | 0.023 | --- | --- | --- |
| Unsecured Loans (%) | 24.61 | 19.74 | 100.00 | 0.00 |
| Auto Loans (%) | 52.53 | 20.69 | 100.00 | 0.00 |
| Real Estate Loans (%) | 7.16 | 12.40 | 96.52 | 0.00 |
| Capital / Total Assets (%) | 13.94 | 6.15 | 100.00 | -7.05 |
| Total Loans / Total Shares (%) | 77.65 | 19.62 | 427.17 | 0.00 |
| Delinquent Loans / Total Loans (%) | 2.03 | 2.99 | 100.00 | 0.00 |
| Standard Deviation of ROA | 0.58 | 3.71 | 318.02 | 0.00 |
| | | | | |
| SINGLE-BOND EDUCATION N = 572 | | | | |
| Total Assets (\$ Millions) | 17.88 | 56.28 | 791 | 0.09 |
| Age (Years) | 40.30 | 13.39 | 3 | 78 |
| Charter (Federal) | 0.58 | --- | --- | --- |
| Non-MSA | 0.30 | --- | --- | --- |
| DeNovo | 0.023 | --- | --- | --- |
| Unsecured Loans (%) | 27.66 | 24.19 | 100.00 | 0.00 |
| Auto Loans (%) | 51.73 | 22.89 | 95.00 | 0.00 |
| Real Estate Loans (%) | 4.98 | 10.58 | 54.37 | 0.00 |
| Capital / Total Assets (%) | 13.91 | 5.61 | 48.65 | -4.57 |
| Total Loans / Total Shares (%) | 76.15 | 20.60 | 175.97 | 6.72 |
| Delinquent Loans / Total Loans (%) | 1.93 | 2.31 | 25.00 | 0.00 |
| Standard Deviation of ROA | 0.53 | 0.51 | 4.586 | 0.011 |
| | | | | |
| SINGLE-BOND MANUFACTURING N = 1508 | | | | |
| Total Assets (\$ Millions) | 12.32 | 73.93 | 2461 | .02 |
| Age (Years) | 40.40 | 13.72 | 2 | 73 |
| Charter (Federal) | 0.57 | --- | --- | --- |
| Non-MSA | 0.24 | --- | --- | --- |
| DeNovo | 0.013 | --- | --- | --- |
| Unsecured Loans (%) | 26.60 | 23.94 | 100.00 | 0.00 |
| Auto Loans (%) | 55.16 | 23.65 | 99.66 | 0.00 |
| Real Estate Loans (%) | 4.37 | 10.47 | 65.61 | 0.00 |
| Capital / Total Assets (%) | 16.60 | 7.39 | 70.71 | -6.19 |
| Total Loans / Total Shares (%) | 77.62 | 22.94 | 256.43 | 0.00 |
| Delinquent Loans / Total Loans (%) | 2.87 | 4.80 | 100.00 | 0.00 |

| | | | | |
|---------------------------|------|------|-------|------|
| Standard Deviation of ROA | 0.72 | 1.21 | 22.08 | 0.00 |
|---------------------------|------|------|-------|------|

Table 3 Continued

| | Mean | Std. Deviation | Maximum | Minimum |
|--|-------|----------------|---------|---------|
| SINGLE-BOND SERVICE N = 1090 | | | | |
| Total Assets (\$ Millions) | 18.6 | 107.90 | 2305 | 0.01 |
| Age (Years) | 41.44 | 15.46 | 1 | 81 |
| Charter (Federal) | 0.55 | --- | --- | --- |
| Non-MSA | 0.14 | --- | --- | --- |
| DeNovo | 0.023 | --- | --- | --- |
| Unsecured Loans (%) | 25.47 | 22.08 | 100.00 | 0.00 |
| Auto Loans (%) | 55.47 | 22.63 | 95.65 | 0.00 |
| Real Estate Loans (%) | 4.60 | 11.42 | 96.52 | 0.00 |
| Capital / Total Assets (%) | 15.21 | 7.40 | 100.00 | 0.00 |
| Total Loans / Total Shares (%) | 77.69 | 23.00 | 427.17 | 0.00 |
| Delinquent Loans / Total Loans (%) | 2.20 | 2.91 | 34.17 | 0.00 |
| Standard Deviation of ROA | 0.87 | 9.68 | 318.02 | 0.02 |
| SINGLE-BOND MILITARY N = 49 | | | | |
| Total Assets (\$ Millions) | 220.7 | 1384 | 9709 | .38 |
| Age (Years) | 44.10 | 9.92 | 1 | 70 |
| Charter (Federal) | 0.82 | --- | --- | --- |
| Non-MSA | 0.10 | --- | --- | --- |
| DeNovo | 0.020 | --- | --- | --- |
| Unsecured Loans (%) | 24.68 | 16.21 | 80.35 | 4.22 |
| Auto Loans (%) | 52.31 | 18.60 | 82.77 | 11.73 |
| Real Estate Loans (%) | 8.47 | 12.57 | 46.83 | 0.00 |
| Capital / Total Assets (%) | 13.39 | 5.69 | 33.26 | 0.53 |
| Total Loans / Total Shares (%) | 65.85 | 21.67 | 97.28 | 0.00 |
| Delinquent Loans / Total Loans (%) | 1.97 | 2.19 | 13.05 | 0.00 |
| Standard Deviation of ROA | 0.41 | 0.22 | .987 | .07 |
| SINGLE-BOND GOVERNMENT N = 1002 | | | | |
| Total Assets (\$ Millions) | 27.00 | 109.63 | 2031 | 0.07 |
| Age (Years) | 48.15 | 15.50 | 1 | 83 |
| Charter (Federal) | 0.43 | --- | --- | --- |
| Non-MSA | 0.13 | --- | --- | --- |
| DeNovo | .023 | --- | --- | --- |
| Unsecured Loans (%) | 28.87 | 23.63 | 100.00 | 0.00 |
| Auto Loans (%) | 50.05 | 21.76 | 94.21 | 0.00 |
| Real Estate Loans (%) | 6.16 | 12.18 | 80.70 | 0.00 |
| Capital / Total Assets (%) | 14.24 | 5.87 | 62.60 | 1.93 |
| Total Loans / Total Shares (%) | 77.32 | 20.19 | 252.61 | 19.12 |
| Delinquent Loans / Total Loans (%) | 1.86 | 2.27 | 18.59 | 0.00 |
| Standard Deviation of ROA | 0.54 | 0.59 | 7.60 | 0.029 |

Table 3 continued

| | Mean | Std. Deviation | Maximum | Minimum |
|------------------------------------|-------|----------------|---------|---------|
| MULTI-BOND N = 3514 | | | | |
| Total Assets (\$ Millions) | 51.70 | 156.21 | 4876 | 0.04 |
| Age (Years) | 43.53 | 13.20 | 1 | 80 |
| Charter (Federal) | 0.84 | --- | --- | --- |
| Non-MSA | 0.17 | --- | --- | --- |
| DeNovo | .028 | --- | --- | --- |
| Unsecured Loans (%) | 21.77 | 13.67 | 100.00 | 0.00 |
| Auto Loans (%) | 51.33 | 17.61 | 100.00 | 0.00 |
| Real Estate Loans (%) | 9.76 | 13.23 | 76.22 | 0.00 |
| Capital / Total Assets (%) | 12.33 | 4.61 | 50.97 | -7.05 |
| Total Loans / Total Shares (%) | 78.15 | 16.25 | 164.37 | 12.02 |
| Delinquent Loans / Total Loans (%) | 1.69 | 2.07 | 37.61 | 0.00 |
| Standard Deviation of ROA | 0.45 | 0.46 | 8.73 | 0.017 |

Table 4

OLS Regressions of the Impact of Membership Type on Various Risk Measures for Occupational Credit Unions

Ordinary least squares regressions of selected risk measures on credit union demographic variables, portfolio mix variables, economic conditions and membership type for all occupational credit unions in 1997. The excluded type is the Multi-Bond Occupational credit union. Data is from the 1997 Call and Income Reports provided by Sheshunoff Information Service's *BankSearch* database

| Variable | LIQUIDITY | CAPITAL | DELINQUENCY | STD DEV ROA |
|------------------------|-------------------------|-------------------------|-------------------------|------------------------|
| Constant | 1.025*** (34.207) | 0.207*** (24.206) | 0.0555*** (12.472) | 1.883*** (15.732) |
| LOG OF TOTAL ASSETS | -0.0202*** (-12.402) | -0.0119*** (-25.589) | -0.0052*** (-21.587) | -0.108*** (-16.760) |
| LOG OF AGE | -0.0258*** (-4.850) | 0.0104*** (6.860) | 0.0027*** (3.387) | -0.0492** (-2.289) |
| FEDERAL CHARTER | -0.0092* (-1.831) | 0.0058*** (4.045) | 0.0025*** (3.388) | -0.0300 (-1.511) |
| NONMSA | 0.0348*** (6.037) | 0.0030* (1.809) | -0.0015* (-1.716) | -0.0453** (-1.993) |
| BANKDEL | 0.172 (0.424) | -0.420*** (-3.611) | -0.0119 (-0.197) | -1.696 (-1.056) |
| DENOVO | 0.0472*** (3.188) | -0.0048 (-1.142) | 0.0011 (0.513) | -0.0376 (-0.483) |
| REAL ESTATE LOANS | 0.124*** (5.119) | 0.0151** (2.179) | 0.0038 (1.045) | -0.0826 (-0.859) |
| UNSECURED LOANS | -0.0897*** (-5.733) | 0.0124*** (2.771) | 0.0086*** (3.705) | 0.186*** (3.002) |
| AUTO LOANS | 0.0951*** (6.181) | -0.0179*** (-4.078) | -0.0052** (-2.289) | -0.355*** (-5.819) |
| EDUCATIONAL | -0.0434*** (-4.880) | 0.0034 (1.347) | -0.0033** (-2.516) | -0.0793** (-2.264) |
| MANUFACTURING | -0.0388*** (-5.949) | 0.0252*** (13.529) | 0.0037*** (3.819) | 0.0716*** (2.787) |
| SERVICE | -0.0266*** (-3.793) | 0.0165*** (8.232) | -0.0004 (-0.339) | -0.0136 (-0.492) |
| MILITARY | -0.107*** (-3.864) | 0.0095 (1.202) | 0.0009 (0.214) | -0.0801 (-0.738) |
| GOVERNMENT | -0.0155** (-2.108) | 0.0090*** (4.308) | -0.0029*** (-2.646) | -0.0403 (-1.387) |
| Adjusted R-Square | 0.059 | 0.182 | 0.108 | 0.082 |
| Number of Observations | 7,723 | 7,723 | 7,723 | 7,643 |

T-statistics in parentheses.

*Statistically significant at the 10% level.

**Statistically significant at the 5% level.

***Statistically significant at the 1% level.

Table 5

Probit Two-Stage Least Squares Regressions of the Impact of the Number of SEGs on Various Risk Measures for a Sample of Multi-Bond Credit Unions

Heckman's probit two-stage least squares regressions of selected risk measures on credit union demographic variables, portfolio mix variables, economic conditions and number of SEGs for all occupational credit unions reporting two or more SEGs in the 1997 CUNA annual survey. Data is from the 1997 Call and Income Reports provided by Sheshunoff Information Service's *BankSearch* database and the 1997 CUNA Annual Survey of members.

| Variable | LIQUIDITY | CAPITAL | DELINQUENCY | STD DEV ROA |
|------------------------|------------|------------|-------------|-------------|
| Constant | 10.8602*** | 0.3304*** | 0.1126*** | 1.5164** |
| | (3.542) | (4.737) | (4.445) | (2.431) |
| LOG OF TOTAL ASSETS | -0.0058*** | -0.0076*** | -0.0052*** | -0.0634*** |
| | (-3.182) | (-5.410) | (-9.983) | (4.902) |
| LOG OF AGE | -0.0058* | -0.0146 | -0.0073** | -0.1117 |
| | (-0.168) | (-1.460) | (2.004) | (-1.268) |
| FEDERAL CHARTER | -0.0041 | 0.0039 | 0.0037** | 0.0203 |
| | (-0.284) | (0.781) | (2.122) | (0.544) |
| NONMSA | 0.0301** | 0.0054 | 0.0002 | -0.0176 |
| | (2.433) | (1.210) | (0.108) | (-0.550) |
| BANKDEL | -0.3373 | -0.5163** | -0.0017 | 1.8090 |
| | (-0.402) | (-2.223) | (-0.019) | (0.838) |
| DENOVO | 0.0414 | -0.0101 | -0.0003 | -0.0136 |
| | (1.589) | (-1.032) | (-0.077) | (-0.130) |
| REAL ESTATE LOANS | -0.0129 | 0.0237* | -0.0021 | 0.0655 |
| | (-0.283) | (1.865) | (-0.451) | (0.555) |
| UNSECURED LOANS | -0.0949** | 0.0113 | 0.0162*** | 0.2609** |
| | (-1.962) | (0.850) | (3.320) | (2.099) |
| AUTO LOANS | 0.0422 | 0.0200* | -0.0101** | -0.1467 |
| | (1.095) | (1.864) | (-2.560) | (1.472) |
| LOG OF SEGS | 0.0166*** | -0.0036*** | 0.0008** | 0.0121 |
| | (4.375) | (-3.359) | (2.248) | (1.232) |
| LAMBDA | 0.0506 | -0.0695*** | -0.0209** | -0.1349 |
| | (0.589) | (-2.674) | (-2.251) | (-0.611) |
| Adjusted R Square | .041 | .097 | .137 | .035 |
| Number of Observations | 1,186 | 1,186 | 1,186 | 1,162 |

T-statistics in parentheses.

*Statistically significant at the 10% level.

**Statistically significant at the 5% level.

***Statistically significant at the 1% level.