

FACTORS DETERMINING CREDIT UNION LOAN RATES IN LOCAL MARKETS

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ABSTRACT

This study uses a variant of the structure-performance model, often used in banking studies, to examine the credit union industries in Idaho and Montana. This should be of interest since credit unions have recently been the fastest growing type of depository institution. The used vehicle loan rate is the dependent variable. We found that credit union size, a proxy measure of economies of scale, and bank market share had negative and significant effects on loan rates. Credit union charge-offs, three-firm concentration ratios, higher salaries and a measure of credit union inefficiency led to significantly higher rates.

FACTORS DETERMINING CREDIT UNION LOAN RATES IN LOCAL MARKETS

Numerous past studies have examined bank structure. Most of these have used the structure-performance paradigm, which hypothesizes that banks in more concentrated markets may find collusion easier, leading to results such as higher profits, lower interest rates paid on deposits and higher interest rates charged on loans. For example, Gilbert (1984) wrote a survey of 44 bank structure studies published during the time period of 1964 to 1983. Tokle (2000) wrote a survey of eleven studies published during the time period of 1979 to 2001 that examined the effect of thrift competition on bank performance. Most of these studies used a structure-performance model.

However, our literature search did not turn up any studies using the structure-performance model for credit unions.¹ This is probably because the banking industry is much larger than the credit union industry, resulting in less interest in credit unions. However, the credit union industry has recently been growing faster than the banking industry. For example, from 1970 to 1999, banking assets grew by 139 percent in real terms, compared to 433 percent for credit union assets (Mishkin 2001, p. 39 and authors' calculations). Another measure of growth shows that the credit union membership-to-U.S. population ratio increased from just 3 percent in 1950 to 28 percent in 1999 (Credit Union Administration and Affiliates: Credit Union Report, 1999 Year-End and U.S. Census). Much of this growth is due to the fact that credit unions have become more like banks in terms of assets and liabilities. For example, until the 1970s, credit unions typically offered only savings accounts on their liability side and consumer loans on their asset side. Today, they often offer checking, money market deposits, and certificates of deposit on their liability side as well as credit cards and mortgages (primary and secondary) on their asset side.

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This study applies a variant of the structure-performance type model to credit unions in Idaho and Montana. We include some traditional independent variables, as well as some new ones to try to determine the factors that influence credit union structure and performance.

1. The Model and Data

The focus of this study is to examine variables that influence interest rates that credit unions charge for used vehicle loans in Idaho and Montana. Used vehicle loan rates were used because this rate is largely determined in local markets and virtually all credit unions offer this type of loan. Data were obtained from the NCUA (National Credit Union Administration) website. Feinberg (2001) used a model where the dependent variable was 24-month unsecured loans and 48-month new vehicle loans for banks in small and medium-sized local lending markets; he selected these dependent variables because they “seem most likely to be provided in a local market.” Since the auto companies do more financing of new autos than used autos, used auto-lending markets should be even more local in nature than new auto lending.

The interest rates for used vehicle loans are measured by credit union. The following variables are hypothesized to affect these used vehicle loan rates. All variables, unless otherwise indicated, will be tested with one-tailed tests. Also, all variables are also measured by credit union, except for the market concentration and bank market share, which are measured by local market.

CONCENTRATION (CR3)

According to the structure-performance hypothesis, depository institutions in more concentrated markets may collude, either explicitly or implicitly, to charge higher interest rates on loans. This hypothesis has been used in many bank structure studies. For example, Berger and Hannan (1989) hypothesized that higher three-firm bank concentration ratios would lead to lower interest rates paid on bank deposits. Feinberg (2001) hypothesized that higher two-firm bank concentration ratios would lead to higher interest rates charged on loans. The three-firm concentration ratio (CR3) for each local market was used to measure credit union concentration and was hypothesized to have a positive effect on loans rates; that is, the higher the combined market share of the three largest credit unions, the higher the loan rates charged. It was calculated from June 1997 NCUA data.²

BANK COMPETITION (BANKSHARE)

The biggest competitors of credit unions for used auto loans are other credit unions and commercial banks. Hence, we use a bank competition variable that was computed as the bank market share for deposits, or as total bank deposits divided by total bank plus credit union deposits for each market. Increases in bank market share could increase credit union competition from banks and lead to lower credit union rates on used auto loans. In a couple of recent papers, higher credit union market share was hypothesized to lead to higher rates paid by bankers on some deposits and lower rates charged by bankers on some loans. In their study on bank structure, Tokle and Tokle (2000)

hypothesized that higher credit union market share and higher S&L market share would increase competition for banks and lead to higher bank deposit rates. And Feinberg (2001) hypothesized that a higher credit union market share would lead to lower rates for new auto and unsecured bank loans. So, our hypothesis uses a similar reasoning, but tests for the effect of bank market share on credit union used auto loan rates. Credit union deposit data come from the NCUA,³ while bank deposit data come from the FDIC. Both data sources are for June 1997.

CREDIT UNION DEPOSIT GROWTH (CUGROWTH)

Credit union growth is measured by the past year's percentage change (from June 1996 to June 1997) in total deposits for each credit union, which come from the NCUA. It may indicate stronger demand for the institution's services, which may then be able to charge higher rates on loans. Hence, CUGROWTH is hypothesized to have a positive effect on loan rates. It is modeled with an interactive term with BANKSHARE.

CREDIT UNION SIZE (CUSIZE)

In banking studies, bank size has been used as a proxy measure for economies of scale (see Hannan, 1984; Barret and Unger, 1991; and Hannan and Liang, 1995). If economies of scale are present, an increase in depository institution size will result in lower average costs, which may be passed on in lower loan rates. Hence, CUSIZE is hypothesized to have a negative sign. It was calculated as June 30, 1997 deposits, in millions, for all branches of the credit unions, and was obtained from NCUA.

WAGE RATE (SALARY)

The credit union wage rate variable, SALARY, was calculated as the average salary plus benefits as of June 30, 1997, in thousands of dollars, for full-time employees⁴, and was obtained from NCUA for each credit union. We used the same hypothesis that Calem and Carlino (1991) used in their banking structure study. On one hand, higher wages may reflect higher costs and hence higher loan rates; on the other hand, higher wages may reflect higher worker productivity and consequently lead to lower loan rates. Thus, salary has no predicted sign, and will be tested with a two-tailed test.

The following two variables, which are indicative of the financial health of the credit union, were obtained from the NCUA and represent conditions as of June 30, 1997.

NET CHARGE-OFFS/AVERAGE LOANS (CHARGE)

Net charge-offs as a proportion of average loans is a key CAMEL ratio. CAMEL ratios refer to Capital Adequacy, Asset Quality, Management, Earnings, and Liquidity, and are used by regulators to assess a credit union's financial condition. This would be the National Credit Union Administration (NCUA) for federally chartered credit unions. Net charge-offs-to-average loans is measured as the total of loans charged off in the prior 12-month period, minus total recoveries, divided by average total loans.

An increase in the amount of charge-offs results in higher expenses, and should lead to higher loan rates.⁵ Consequently, CHARGE is expected to have a positive effect on used vehicle loan rates.

EFFICIENCY MEASURE (EFF)

One measure of a credit union's efficiency is EFF, which is the number of full time employees per one million dollars in loans. The more employees it takes to process loans (a labor intensive process), the less efficient it would be. This would also capture efficiencies that credit unions obtain from making larger average sized loans. Since the loan processing is similar for large or small loans, credit unions that make on average larger loans have an efficiency advantage. EFF, or variations such as full time employees per one million in loans and checking, are commonly used by credit unions to measure their own efficiency. The larger EFF is, the less efficient is the credit union, which should result in higher loan rates. Hence, EFF is hypothesized to have a positive sign.

The structure-performance model used in this study is:

$$\text{Used vehicle loan rate} = b_0 + b_1\text{CR3} + b_2\text{BANKSHARE} + b_3\text{CUGROWTH} + b_4\text{BANKSHARE} * \text{CUGROWTH} + b_5\text{CUSIZE} + b_6\text{SALARY} + b_7\text{CHARGE} + b_8\text{EFF}.$$

Means and standard deviations of the variables are shown in Table 1. A table of the cities included in the sample and their populations is shown in the appendix.

Table 1. Mean and standard deviation of variables. (n = 112)

Variable symbol	Variable definition	Mean	Standard deviation
USEDV	Used vehicle loan rate, basis points	954.35	106.34
CR3	Three-firm concentration ratio	75.24	17.04
BANKSHARE	Market share of banks, %	72.37	9.78
CUGROWTH	Market (share) growth	10.69	13.24
CUSIZE	Credit union deposits, in \$ millions	20.37	27.01
SALARY	Average salary and benefits of full-time employees, \$ thousands	25.62	6.48
CHARGE	Net charge-offs / average loans	0.56	1.59
EFF	Full-time employees per \$1 million in loans	0.86	0.47

2. Sample

The sample consists of 112 credit unions in Montana and Idaho located in cities with a population of 8,000 or more for year-end 1996. The local market is taken to be these cities, rather than counties, because Montana and Idaho are sparsely populated rural states with large geographic counties that have

cities quite far apart from each other. Cities that share a common boundary (twin cities) are included in the same market. The cities are listed in Appendix Table 1.

3. Results

The ordinary least squares regression results are reported in Table 2. The model is significant at the 1 percent level, and explains 28 percent of the variation in loan rates as measured by adjusted R squared. The dependent variable, USEDV, and CUSIZE are in natural logarithm form⁶. Standard errors of the coefficients were adjusted using the White procedure. All of the independent variables are significant at the ten percent level or better.

Table 2. OLS Regression Results. The natural log of used vehicle loan rate is the dependent variable.

Predictor	Coefficient	White Standard errors	p-value*
Constant	6.9003		
CR3	0.0009	0.00052	.0920
BANKSHARE	-0.0025	0.00141	.0812
CUGROWTH	-.0096	0.00551	.0819
BANKSHARE*CUGROWTH	0.0001	0.00007	.0433
lnCUSIZE	-0.0458	0.00749	<.0001
SALARY	0.0044	0.00200	.0277
CHARGE	0.0104	0.00360	.0041
EFF	0.0399	0.02067	.0536

R² = 33.3% Adjusted R² = 28.1%
 F calculated = 6.42 (p-value <.0001)

*p-values are for χ^2 , since White standard errors are asymptotic rather than exact.

The concentration ratio, CR3, appears to have a small but positive effect on used vehicle loan rates for this sample of credit unions. Hence, the structure-performance hypothesis, often used in banking studies, also applies to credit unions.

The larger the share of banks in the local market, the lower the loan rates offered by these credit unions. An increase in bank market share is expected to lower the used vehicle loan rate very slightly when evaluated at the mean CUGROWTH, and holding other factors constant. Hence, bank competition appears to have a small, but significant effect on credit union loan rates. In addition, an increase in

CUGROWTH is expected to increase the used vehicle loan rate by a small amount, evaluated at the mean BANKSHARE, and holding all else constant.

Economies of scale appear to affect loan rates in this sample of credit unions. For every ten percent increase in deposits, used vehicle loan rates fall by about one-half of one percent. This effect is significant at the 1 percent level. In addition, an increase in the average full-time employee salary causes loan rates to increase. This indicates that higher salaries increase expenses but do not necessarily reflect higher productivity.

Charge-offs as a proportion of average loans is one of the key "CAMEL" ratios used by NCUA in evaluating credit union asset performance and risk. An increase in charge-offs tends to increase loan rates. This indicates that a higher amount of charge-offs result in higher expenses, which are passed on to members in the form of higher loan rates.

The efficiency ratio, EFF, performs reasonably well in explaining variation in used vehicle loan rates. Recall that the larger EFF is, the less efficient is the credit union. As expected, this variable had a positive sign, which indicates that less efficient credit unions tend to charge more for loans.

4. Summary and Conclusion

Numerous past studies have examined bank structure. This study uses a variant of the structure-performance model commonly used in these banking studies to examine credit union structure and performance in Idaho and Montana. The dependent variable was used vehicle loan rates, a rate that is determined largely in local markets and is offered by virtually all credit unions. Of the seven independent variables, all had the hypothesized sign and were significant at the ten percent level or better.

A market concentration measure is often included in bank structure studies. Here, a credit union three-firm concentration ratio was positive as expected. Hence, it appears that even for non-profit firms such as credit unions, a higher industry concentration can lead to a less competitive result. And, the BANKSHARE variable had a negative and significant effect on loan rates, suggesting that bank competition may by itself lower credit union loan rates some. The credit union growth variable had a positive and significant effect on loan rates when evaluated at the mean level of BANKSHARE, which suggests that a credit union with stronger demand may charge higher rates, other factors equal in a typical local market.

The credit union size coefficient was negative and significant at the one percent level, suggesting the presence of economies-of-scale. The wage rate variable was also positive and significant. It appears higher wages lead to higher costs that lead to higher loan rates, rather than higher productivity that could lead to lower loan rates.

The net charge-off coefficient was positive and significant. Credit unions with higher charge-offs will have higher costs, which lead to higher loan rates. This also indicates the use of risk-based lending practices, which some credit unions have been adopting since the mid-1990s. With risk-based lending, credit unions score their loan applicants by risk, using sources such as credit reports. Then, they use

these scores to categorize different risk groups, with the more risky group members paying higher loan rates.

Proponents of risk-based lending argue that it helps members as well as the credit unions. Higher-risk members may get some loans at the higher rate that the credit union feels it could not make at a lower rate. The alternatives for these members would be loans at higher rates from institutions such as finance companies or even pawnshops and pay-day loan lenders. And lower-risk members, who often shop for rates, may get lower rates than is possible with a single rate for all. And, the efficiency variable performed as expected: a more efficient operation translates into better loan rates.

Credit unions, as a group, are still much smaller than banks. However, they serve an increasing segment of our population and in the 1990s, they were the fastest growing type of depository institution. Future research should continue to explore the structure of credit unions.

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ENDNOTES

1. Two articles by Emmons and Schmid (1999 and 2000) use a model that is related to the structure-performance model to show that higher bank concentration increases credit union participation rates (measured for a credit union as members divided by potential members). Feinberg (2002) also uses a model that is similar to the structure-performance model. He examined in a regression model what effect the cost of funds, population size, concentration of the leading 2 non-credit-union institutions, credit union market share and a dummy variable for states with a credit union share greater than 10 percent have on credit union loan rates in 77 different local markets. Using a strict definition, this is not a structure-performance model since there is no measure of credit union concentration as an independent variable.
2. The FDIC reports deposits by city and by branch for banks and S&Ls. However, the NCUA reports deposits by credit union only, and not by city or branch. Twenty-two credit unions in Idaho and Montana had branches in more than one city in the sample and/or in other cities not in the sample (some were out of state, such as in Texas and New Jersey). Each of these credit unions had to be contacted individually to obtain their deposits by city in the sample. This was a time consuming process and required the cooperation of each CEO of these 22 credit unions to voluntarily give the authors these data.
3. *ibid.*
4. Full-time employees are defined as those working 26 hours per week or more.
5. In the fringe lending markets, which would include some or much of the business for pawn shops, payday lenders and finance companies, adverse selection may occur where the much higher loan interest rates (compared to credit unions) may attract borrowers who are more risky. But, interest rates on loans among credit unions don't vary nearly as much as between credit unions and pawn shops, payday lenders and finance companies. Hence, credit unions as a group are not involved in fringe market lending. So, we reason that higher charge offs and the higher risk associated with these loans lead to higher loan rates.
6. Both of these variables are in natural logarithm form. The loan rate is in logarithm form because of the implicit assumption of normally distributed error terms, and using the logarithm of firm size is common practice.

Appendix Table 1. Cities in the sample and their 1996 population.^a

City	Population
Boise/Garden City, ID	161,451
Pocatello/Chubbuck, ID	60,172
Idaho Falls, ID	48,079
Nampa, ID	37,558
Twin Falls, ID	31,989
Coeur d'Alene, ID	31,076
Lewiston, ID	30,271
Caldwell, ID	21,089
Moscow, ID	20,101
Rexburg, ID	14,204
Blackfoot, ID	10,406
Burley/Heyburn, ID	12,183
Mountain Home, ID	8,988
Billings, MT	91,195
Great Falls, MT	57,758
Missoula, MT	51,204
Butte/Silver Bow, MT	34,051
Bozeman, MT	28,522
Helena, MT	27,982
Kalispell, MT	15,678
Havre, MT	10,232
Miles City, MT	10,057
Anaconda, MT	8,882

^a Source: U.S. Census Bureau