

## **Pre- and Post-Recession Performance Comparisons: Low Income Designated Credit Unions versus Non-designated Credit Unions**

Robert C. Forrester

*Midwestern State University*

John E. Martinez

*Midwestern State University*

Yoshi Fukasawa

*Midwestern State University*

### **Abstract**

*Many banks suffered, and some have even failed, during the most recent national recession which began in 2007 and ended in 2009. Credit unions with an overall mission and designation to serve low-income members of their community also underwent stress during the financial crisis. How they fared during this time of extreme financial turmoil is a vitally significant concern for policy-makers. Although the ultimate owners of credit unions are the members who may receive a return based on below market rates charged to borrowers or above market rates paid in the form of interest on the deposit of savers, net returns increase a credit union's ability to offer its members these types of benefits. This analysis supports the hypothesis that low-income members of a community can be profitably served without jeopardizing the returns to the institution, even in an event such as the last economic turndown.*

### **Introduction**

Many banks suffered, and some have even failed, during the most recent national recession which began December 2007 and ended June 2009. How their counterparts - the nation's credit unions – fared during this time is also a vitally significant concern for policy-makers. The primary concern of the National Credit Union Administration (NCUA) is to ensure the safety and soundness of the credit union system. Consequently, it is vitally important for the NCUA to know how credit unions fared during this period of extreme financial turmoil. As an adjunct to its overall mission, the NCUA seeks to make more credit available to “people of small means” for provident purposes. To further this purpose, the agency has developed a number of initiatives to facilitate credit unions (CUs) that seek to serve the underserved.

Before a credit union can qualify for the various NCUA programs of assistance in reaching out to the underserved, it must first acquire “low-income designation” status.<sup>1</sup> Consideration of the performance of these designated “low-income” credit unions (LICUs) is important because their success or failure may have important consequences for the economic development of the specific markets they seek to serve. From a policy standpoint, it is essential to know how these LICUs weathered the nation’s most recent financial storm.<sup>2</sup>

## Survey of Literature

Credit Unions are an important segment of the financial institutions industry in the United States. Although they represent only 9.3% market share, they represented 6,795 credit unions, 98.4 million members, \$1.083 billion in assets, and \$659 billion in loans (CUNA, 2013). Credit unions are experiencing the fastest growth since 2006, with credit union loans increasing by 7.3% in 2013 as compared to 2.8% growth in loans by FDIC-insured commercial banks (CUNA, 2013).

Although credit unions are an important financial intermediary, little research is done in this area. One reason for the lack of research may be because of the cooperative nature of the industry. As such, all owners are borrowers and/or depositors resulting in members with deposits wanting larger interest rates, while members with loans wanting lower interest rates.

Much of the research in credit unions considers whether an event results in the institutions’ efficiency (Bauer, 2008). Much of this analysis is conducted using data envelopment analysis (DEA) and focuses on the cost function. Bauer (2008) examines credit union through the lens of returns to detect abnormal performance. This analysis contributes to the literature in three ways: 1) by utilizing an event study methodology to examine credit union performance. The event will be pre- and post- financial crisis.

Next, the study examines returns to two types of credit unions, those with and without low-income designation to detect if abnormal return performance exists in support of the Bauer (2008) return performance.

Finally, we examine and contribute to the literature on low-income credit unions (LICU). LICUs are those credit unions that have an explicit mission to serve distressed communities or base their business model on serving low- and moderate- income neighborhoods and have been designated as LICUs by the National Credit Union Administration (NCUA). To receive the designation, at least half of the credit union’s members must earn less than 80% of the average for all wage earners or less than 80 percent of the median household income for the nation. Credit unions that receive NCUA LICU status are eligible for support from government agencies; however, many of these LICUs adapt by adjusting loan underwriting procedures and cross selling other credit union products, such as electronic technologies, credit cards, etc. (Williams, 2004). Although the effects of risk and performance affects all financial

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<sup>1</sup> A low-income designated credit union is defined in section 701.34 of the NCUA Rules and Regulations.

<sup>2</sup> While individual credit unions may have avoided many of the subprime problems of other lenders, corporate credit unions -- credit unions that serve as credit unions to other credit unions -- did run into problems with mortgage-backed securities. However, this study focuses strictly on non-corporate credit unions.

intermediaries, the impact of borrowing and saving by lower income owners in a LICU should reflect lower volume of loans and lower returns.

As of 2010, there were 1,130 credit unions designated as LICUs. No thorough systematic efforts have been made to evaluate the performance of these “low-income” credit unions. A number of studies have focused on various aspects of credit unions. Some have modeled growth and objective functions of credit unions (Black and Dugger, 1981; Smith, Cargill and Meyer, 1981; Smith, 1984; Kaushik and Lopez, 1994) while others have focused on how credit unions allocate member benefits (Walker and Chandler, 1977; Patin and McNiel, 1991). A number of studies have delved into the question of how parent organization stability affects credit union performance (Patin and McNiel, 1996, 1997).

The effect of the common bond among credit union members on operating behavior and performance has been analyzed by (Black and Schweitzer, 1985, 1987; McNiel, Patin and Martinez, 2004; Patin and McNiel, 2001). However there has been relatively little analysis of the performance of LICUs except for that by Kebede and Jolly (2001). Kebede and Jolly (2001) compare the effects of financial and management structure among 34 LICUs in six southern states from 1992-1996.

Virtually no study has examined the performance of LICUs in comparison to that of CUs without low-income designation operating in the same geographic market. For purposes of this paper, those CUs without this ‘low-income’ status are simply referred to as “non-designated” credit unions (NDCUs).

This paper is concerned with the viability of small LICUs and focuses on whether there are significant differences between their performance and that of a comparative set of NDCUs. The paper is especially focused on how the LICUs fared relative to NDCUs during the most recent financial upheaval which shook the nation’s credit system.

If public policy is geared to providing both short and long term subsidization to LICUs, identifying areas of nonperformance during a period of widespread financial stress for these institutions would help to formulate more efficient policy initiatives.

## **Plan of Study**

In the first part of the paper, descriptive data derived from balance sheets and income statements are used to examine differences in a number of ratios examining the composition of assets, liabilities, and capital. Additional ratios are computed to analyze a variety of performance measures.

Data is collected, for all years inclusive, from 2006 to 2010 with primary emphasis on two years, 2006 and 2010. The year 2006 is a pre-recession year and the year 2010 is a post-recession year. This descriptive summary will be used to provide the framework for the second part which relies on generalized least squares regression to compare performance across the two groups of CUs for both years.

Statistical cost regression models have been used in industry structure for a number of purposes, but not in the context of exploring differences among these two groups of CUs. In this paper, statistical regression techniques are used to compare the behavior of a sample of LICUs to a matched set of NDCUs in the same zip-code area.

Statistical cost regression models use a generalized least squares regression model (GLM) to relate the composition of a firm’s balance sheet to its earnings. ROA is defined as the

ratio of net income (after loan-loss provisions) to total assets. ROE is the ratio of net income (after loan-loss provisions) to net worth or capital. Every bank and credit union in the U.S. is subject to the CAMELS rating to classify its overall condition. The components of CAMELS are capital adequacy, assets, management capability, earnings, liquidity and sensitivity to market and interest rate risk. The ROA is the core metric in the CAMELS rating (Goddard, McKillop, & Wilson, 2008). Under strict assumptions, the model can provide estimates of marginal rates of return and costs on individual assets and liabilities for the two groups of institutions.

### **Sample Data**

The behavior of small LICUs will be compared to a matched sample of small NDCUs. We limit our sample to those that are in credit union Peer Groups 1 and 2 categories which include small CUs with less than \$2 million in assets and those with \$2 million to less than \$10 million dollars in total assets. These small low-income designated credit unions should be the most affected by the low-income designation in a pre- and post- recessionary market.

While the study is national in scope, matching is done on a geographical basis with the primary market delineated on the basis of a single zip-code area. This methodology should prove advantageous over more traditional methods which have relied on a variety of wider political boundaries such as a metropolitan area, an entire state, or some other broadly defined area as the relevant geographic market.

A sample of time series and cross-section data for two years, 2006 and 2010, is used for estimation purposes. The assets and liabilities ratios used for this study are taken from year-end balance-sheet data. The data on earnings are obtained from their income statements.

The data used is derived from official year-end reports submitted by each CU member to the NCUA. The data covers two years, a pre-recession year (2006) and a post-recession year (2010). For this time period, there were only 62 Zip code areas throughout the entire nation with at least one small institution from each group concurrently operating in the designated area. Only those CUs that remained active during all five years of this study period were included.

When more than one NDCU exists in the zip-code area, only one is selected - the one most comparable in size to their counterpoint LICU. For each year, the sample size consists of 124 CUs with an equal number (62) from each group (see Table 1 below).

**TABLE 1: Sample Frequency and Mean Asset Size  
for Small CUs (Peer 1 and 2) Matched-Pair CUs  
by Year**

Description	2006	2010
NDCUs		
Mean assets	\$6,403,502	\$6,405,791
Sample size	62	62
LICUs		
Mean assets	\$4,879,315	\$4,923,709
Sample size	62	62
All CUs		
Mean assets	\$5,641,409	\$5,664,750
Sample size	124	124

### Descriptive Analysis

In this section, descriptive data, derived from balance sheets and income statements, are used to examine differences in a number of ratios related to the composition of assets, liabilities, and capital. Additional ratios are computed to analyze a variety of performance measures. This descriptive summary will be used to provide the framework for the second part which relies on generalized least squares regression to compare performance across the two groups of CUs.

As shown in Table 1, the mean asset size of all the sampled banks was \$5.6 million in 2006 and \$5.6 million in 2010. On average, NDCUs were about One-third larger than LICUs in both years.

As revealed in Table 2, total income as a percent of total assets was significantly higher for LICUs than for NDCUs. At the same time, total expenses as a percent of total assets were significantly higher for LICUs. However, the resulting net income was higher for LICUs than NDCUs. Interestingly, LICUs hold significantly less capital than do NDCUs which could be a problem in the event of another national downturn.

**TABLE 2a: Mean Differences in Financial Ratios, as a percent of total assets,  
between Non-Designated and Low Income Credit Unions, 2006**

Variable Name	NDCU	LICU	t Value	Prt   t
Total Income	6.18%	7.32%	3.5	0.0006
Total Expenses	5.42%	6.33%	3.2	0.0019
Net Income	0.33%	0.66%	1.4	0.1712
Cash	15.84%	18.18%	1.0	0.3190
Net Investments	32.02%	24.69%	2.3	0.0248
Net Loans	49.93%	54.56%	1.4	0.1514
Real Estate Loans	12.22%	12.44%	0.5	0.9586
Other Loans	87.78%	87.56%	0.1	0.9586
Other Assets	0.40%	0.79%	2.8	0.0059
Total Liabilities	4.04%	3.48%	1.3	0.2102
Total Shares and Deposits	81.00%	83.76%	2.0	0.0443
Equity	14.92%	11.43%	2.9	0.0047

**TABLE 2b: Mean Differences in Financial Ratios, as a percent of total assets, between Non-Designated and Low Income Credit Unions, 2010**

Variable Name	NDCU	LICU	t Value	Prt   t
Total Income	4.65%	5.36%	2.3	0.0214
Total Expenses	4.57%	5.37%	2.7	0.0078
Net Income	0.25%	0.46%	1.1	0.2753
Cash	18.85%	21.06%	0.8	0.4032
Net Investments	36.13%	25.26%	3.1	0.0021
Net Loans	43.05%	51.08%	2.4	0.0162
Real Estate Loans	10.49%	9.22%	0.3	0.7501
Other Loans	89.51%	90.78%	0.3	0.7501
Other Assets	0.32%	0.81%	2.5	0.0128
Total Liabilities	3.79%	3.44%	0.7	0.4806
Total Shares and Deposits	82.99%	86.24%	2.1	0.0357
Equity	13.22%	9.89%	2.4	0.0162

### Estimation Procedure - Generalized Least Squares Model (GLM)

Traditional statistical cost methodologies use least squares analysis to explain variation in a firm's earnings. The fundamental hypothesis of the model is that the rate-of-return on assets is positive while the rate-of-return on liabilities is usually negative.

This paper uses two versions of the generalized least squares regression model to investigate profitability differences between NDCUs and LICUs. The first regression model is based on aggregate ratios of assets and liabilities while the second model decomposes the aggregate ratios using more detailed asset and liability categories. This study uses net income as the dependent variables.

To avoid problems of extreme multicollinearity, one component from each side of the balance sheet is eliminated. In the aggregated model, cash assets are excluded from total assets to form net assets. The other side of the balance sheet excludes equity leaving only liabilities. Both net assets and liabilities are divided by total assets to form the aggregate ratios. One category from each side of the balance sheet is excluded to avoid problems of linear dependence. For the aggregated model, the above estimated equation is as follows:

$$\text{ROA} = \text{AST} * \mathbf{b} + \text{LBS} * \mathbf{m} + \text{Yr} * \mathbf{t} + \alpha_1 + \mathbf{e}$$

Where,

ROA = N x 1 vector of observations on net income (earnings) divided by total assets

AST = Net assets

LBS = Liabilities

b, m = estimated coefficients.

Yr = Dummy variable for Year: 2006=1      2010=0

t = estimated dummy coefficient

Pre-recession: 2006 = 1      Post-recession:      2010 = 0

$\alpha_1$  = estimated constant term

e = N X 1 vector of normally distributed random errors with zero mean, constant variance, and zero covariance over time

When net income is the dependent variable, the coefficient (*b*) should approximate the market rate of return earned on net assets. The liability coefficient (*m*) can be interpreted as an approximate marginal cost estimate and should therefore have a non-positive sign. Also, when net income is used as the dependent variable, the coefficient *a<sub>1</sub>* measures income flows unrelated to balance sheet ratios. Instead, it is related to a host of off-balance sheet items. Because the dependent variable is net income, the constant term (*a<sub>1</sub>*) reflects net fixed revenue or costs, it can be either positive or negative. This coefficient should also be interpreted as a measure of economies of scale. For the dummy variable representing year (Yr), the coefficient (*t*) represents the difference between years.

In the second model, both the asset and liability sides of the balance sheet are decomposed into a number of separate ratios. For the disaggregated model, the following equation is used to model earnings for each credit union designation:

$$\text{ROA} = \text{AST} * \mathbf{b} + \text{LBS} * \mathbf{m} + \text{Yr} * \mathbf{t} + \alpha_1 + \mathbf{e}$$

Where,

ROA = N x 1 vector of observations on net income (earnings) divided by total assets

AST = N x K matrix of observations on asset variables divided by total assets

LBS = N x J matrix of observations on liability variables divided by total assets

b = K x 1 vector of estimated coefficients for the various asset categories

m = K x 1 vector of estimated coefficients for the various liability categories

Yr = Dummy variable for Year: 2006=1      2010=0

$\alpha_1$  = estimated constant term

e = N X 1 vector of normally distributed random errors with zero mean, constant variance, and zero covariance over time



Once again, to avoid problems of extreme multicollinearity, one component from each side of the balance sheet is eliminated. From the asset size, cash is eliminated. From the claims side, equity is eliminated.

The vector of coefficients  $b$  and  $m$  are estimated marginal rates of return (or cost) on the various assets and liabilities ratios. The parameter ( $a_1$ ) is an estimated intercept or constant term. To reduce potential problems with unequal variance of the error term, all independent and dependent variables are divided by total assets. A dummy variable ( $Yr$ ) is used to capture the effect of time.

This study uses net income as the dependent variables. When net income is the dependent variable, each element of  $b$  should approximate the market rate of return earned on the various asset components. Each liability coefficient ( $m$ ) can be interpreted as an approximate marginal cost estimate and should therefore have a non-positive sign. As in the previous model, when net income is used as the dependent variable, the coefficient  $a_1$  measures income flows unrelated to balance sheet ratios. Instead, it is related to a host of off-balance sheet items. As before, because the dependent variable is net income,  $a_1$  reflects net fixed revenue or costs, it can be either positive or negative. This coefficient should also be interpreted as a measure of economies of scale. For the dummy variable representing year ( $Yr$ ), the coefficient ( $t$ ) represents the difference between years.

## Regression Results

The regression technique used in this study attributes inter CU differences in profitability to differences in their balance sheet composition. This relation is examined by regressing accounting earnings on a variety of assets and liabilities ratios for each credit union. The fundamental hypothesis of the model is that the rate-of-return on assets is positive and varies across the various asset components, while the rate-of-cost on liabilities is usually negative and varies across the various liability components.

Both versions of this model hypothesize that a credit union's net income can be expressed as the weighted sum of its various assets and liabilities, the weights being the net revenue or costs attributable to each item. The study uses a sample of pooled time series and cross-section data for the two years 2006 and 2010.

The empirical evidence suggests that asset and liability management played only a minor role in explaining inter-credit union differences in profitability between the two sets of CUs during the period examined. The estimated mean differences in the aggregate coefficients for Net Assets and Liabilities are, for example, 3.6% and -4.0%, respectively, with the insignificant  $t$ -values, as shown in Table 3a. Likewise, the estimated mean differences in the decomposed coefficients between LICUs and NDCUs range from 0.00% to 8.37% (in absolute value) with no statistical significance in all cases, as shown in Table 3b.

**TABLE 3a: Dependent Variable-Net Income**  
**Estimated Mean Differences in Aggregate Coefficients across Regression**  
**Equations for Sampled LICUs and NDCUs**

Parameter	LICUs	NDCUs	Diff	t –Value	Pr > t
Constant	13.79%	-13.29%	-0.51%	-0.07	0.9418
Year-Dummy 2006=1 2010=0	0.97%	0.24%	0.73%	1.53	0.1275
Net assets	18.60%	15.00%	3.60%	0.56	0.578
Liabilities	-5.70%	-1.70%	-4.00%	-1.63	0.1029

**TABLE 3b: Dependent Variable-Net Income**  
**Estimated Mean Differences in Decomposed Coefficients across Regression**  
**Equations for Sampled LICUs and NDCUs**

Parameter	LICUs	NDCUs	Diff	t –Value	Pr > t
Constant	-15.40%	-16.20%	0.90%	0.07	0.9403
Year-Dummy 2006=1 2010=0	0.91%	0.22%	0.69%	1.36	0.1740
Cash Deposits	21.98%	17.56%	4.42%	0.43	0.6706
Cash Equivalentents	22.59%	17.12%	5.48%	0.52	0.6033
Net Investments	21.99%	17.35%	4.64%	0.44	0.6582
Real Estate Loans	20.31%	18.62%	1.69%	0.16	0.8726
Other Loans	20.69%	18.10%	2.59%	0.25	0.8058
Shares/Deposits	8.99%	1.24%	7.75%	0.62	0.5354
Equity	-6.80%	-1.29%	-5.51%	-1.40	0.1631
Reserves	12.29%	-3.92%	-8.37%	-1.00	0.3191

### Summary and Conclusions

Many banks suffered, and some have even failed, during the most recent national financial crisis which began in 2008. How their counterparts - the nation's credit unions – fared during this time is also a vitally significant concern for policy-makers.

Virtually no study has examined the performance of LICUs in comparison to that of CUs without low-income designation operating in the same geographic market. This paper has focused on how the LICUs fared relative to NDCUs during the most recent financial upheaval. We conclude that there are no real significant differences between the performance of LICUs and that of a comparative set of NDCUs.

The primary concern of the National Credit Union Administration (NCUA) is to ensure the safety and soundness of the credit union system. Consequently, it is vitally important for the NCUA to know how credit unions fared during this period of extreme financial turmoil.

In seeking to make more credit available to “people of small means,” the NCUA should continue to develop a number of initiatives to facilitate credit unions (CUs) that seek to serve the underserved. A credit union can only acquire “low-income designation” status if it reaches out to the underserved. In so doing, it would then qualify for the various NCUA and government programs of assistance. The performance of these designated “low-income” credit unions (LICUs) is extremely important to policy-makers. This research shows that there was no significant difference in performance (profitability) between LICUs and NDCUs during the last recession. The success or failure of these institutions has important consequences for the economic development of the specific markets they seek to serve. From a policy standpoint, it is of paramount importance to policy-makers that these LICUs weathered the nation’s most recent financial storm equal to their counterpart NDCUs.

Although the ultimate owners of credit unions are the members who may receive a return based on below market rates charged to borrowers or above market rates paid in the form of interest on the deposit of savers, net returns increase a credit union’s ability to offer its members these types of benefits. This analysis supports the hypothesis that low-income members of a community can be profitably served without jeopardizing the returns to the institution, even in an event such as the last economic turndown.

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