

**GROWING COMPETITION IN CONSUMER LOAN  
AND DEPOSIT MARKETS: A CASE OF MARKET  
INTER-DEPENDENCE BETWEEN CREDIT  
UNIONS AND COMMERCIAL BANKS**

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**Abstract**

The paper seeks to examine the case of a plausible interdependence between large credit unions and commercial banks in an environment of growing competition in consumer loan and deposit markets. The theoretical results suggest the existence of market interdependence between these two financial intermediaries both under cost minimization and profit maximization by credit unions.

**INTRODUCTION**

Controversies surround the appropriateness of the credit unions' overriding objective. They spring mainly from the cooperative nature of credit unions which act to further the economic interests of their lending and borrowing members [11]. Several studies [1, 2, 3, 4, 5, 7, 8, 9, 10, 13, 14] suggest that cost minimization ought to be the most appropriate objective of the credit unions. Often, profit maximization has also been suggested as a reasonable objective for the credit unions (i.e., Taylor [12]). Taylor's work concludes that credit unions as profit maximizing perfect competitors are economically efficient both in terms of the volumes of loans and the associated lending rates. But this view has been challenged in a number of studies [13, 8]. According to these studies, Taylor's aforementioned results are valid only for large credit unions in an environment of perfectly competitive loan and deposit markets. In fact, it is not yet crystal clear whether the credit unions ought to behave as cost minimizers or profit maximizers.

The large credit unions, in particular, have been increasingly reaching out to the consumer loan and deposit markets. Virtually, there is very little difference between a large credit union and a commercial bank in terms of service offerings from checking accounts and automatic teller machines to mortgages and home equity loans. The financial markets have been substantially liberated through the waves of deregulations since the early 1980s. The financial markets are now much more competitive than they were in the preceding decade.<sup>1</sup> The credit unions continue to expand the operations beyond their traditional segmented markets. It is reflected through the fact that the credit unions' consumer lending grew about 23 percent over 1986-1991. Credit unions concentrate on consumer loans. This was 44 percent of their total asset<sup>2</sup> (\$234 billion) in 1991. The credit unions' traditional tough competitors in these markets are the commercial banks. The commercial banks still have larger shares in these markets in terms of volumes. Their current share in the consumer loan market is 46 percent of the total volume of such loans, and that of the credit unions is only 13 percent.<sup>3</sup> The credit unions' role in these markets continues growing rapidly.

Since there exist ambiguities around the appropriateness of the most suitable objective for credit unions, the paper seeks to examine the interdependence between credit unions and commercial banks under two different objectives (i.e., cost minimization and profit maximization). The rest of the paper unfolds as follows: Section II outlines the base model. Section III discusses the lending and deposit mobilization behaviors of credit unions under constrained cost minimization.

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Section IV analyzes these behaviors under constrained profit maximization. Finally, Section V summarizes the results and offers some conclusions.

### THE BASE MODEL

To overcome the problem of arbitrary parameterization, the base model for credit unions is outlined in general functional form in line with the intermediation approach as developed in Sealey and Lindley [6].<sup>4</sup> This is shown as follows:

Equation 1

$$i = f(L, L^*); f_1 < 0, f_2 < 0$$

Equation 2

$$r = g(D, D^*); g_1 > 0, g_2 > 0$$

Equation 3

$$L = D - R$$

Equation 4

$$R \geq KD; 0 < K < 1$$

where  $i$   $\equiv$  the credit unions' consumer loan rate,  $L$   $\equiv$  the credit unions' total supply of consumer loan,  $L^*$   $\equiv$  the commercial banks' total supply of consumer loan,  $r$   $\equiv$  the credit unions' deposit rate offering,  $D$   $\equiv$  the credit unions' total demand for deposits,  $D^*$   $\equiv$  the commercial banks' total demand for deposits,  $R$   $\equiv$  total liquidity reserves with the credit unions, and  $K$   $\equiv$  the required liquidity reserve ratio. Furthermore,  $f_1$  and  $g_1$  denote the first order partial derivatives of the respective  $i$ th arguments.

The model assumes tax-exempt status of the credit unions. Equation (1) is an inverse supply function for the credit unions' consumer loan. It assumes that the credit unions' consumer loan rate is negatively related to both  $L$  and  $L^*$ . Equation (2) is the inverse demand function for deposits. It states that the credit unions' deposit rate offering is positively related to both  $D$  and  $D^*$ . Equation (3) is, in fact, an accounting relationship which shows that the credit unions' total volume of loanable fund for consumer loan is the excess of total deposits over the total reserve balance. Finally, equation (4) specifies the reserve constraint facing the credit unions. The total amount of reserves should not slide below the requirement, set by the monetary authority.

The endogenous variables are  $i$ ,  $r$ ,  $L$ ,  $R$  and  $D$ . The list of exogenous variables includes  $L^*$ ,  $D^*$ , and  $K$ . For this work, the endogenous variables of interest are  $L$  and  $D$ .

### COST MINIMIZATION

The object in this section is to explore the interdependence between credit unions and commercial banks under cost minimization<sup>5</sup> subject to the total availability of loanable fund. The optimization problem is formulated as follows:

Equation 5

$$\text{Minimize } C = D g(D, D^*) + F$$

Subject to:

Equation 6

$$L = D(1 - K)$$

where the additional notations C and F represent total cost and total fixed cost, respectively. In equation (5), the first term represents total variable cost. The second term is a measure of total fixed cost which includes overhead cost and the cost of other nonfinancial services rendered to the members. The loanable fund constraint, as given in equation (6), is obviously obtained by substituting equation (4) for R into equation (3).

Taking total differentials of equations (5) and (6) with respect to L and D, and rearranging the terms, the followings are obtained:

$$\begin{bmatrix} 0 - g(D, D^*) - Dg_1 \\ 1 - (1 - K) \end{bmatrix} \begin{bmatrix} dL \\ dD \end{bmatrix} = \text{Exogenous Terms}$$

where the determinant of the Jacobian (J) is  $g(D, D^*) + Dg_1 > 0$ . The comparative statics are now in order as follows.

### Effects Of An Increase In L\* On L And D

On further differentiation with respect to L\*:

$$\begin{bmatrix} J \end{bmatrix} \begin{bmatrix} \frac{dL}{dL^*} \\ \frac{dD}{dL^*} \end{bmatrix} = \begin{bmatrix} g + Dg_2 \\ 0 \end{bmatrix}$$

By invoking Cramer's rule:

$$\frac{dL}{dL^*} = \frac{-(1 - K)(g + Dg_2)}{g + Dg_2} < 0$$

and

$$\frac{dD}{dL^*} = \frac{-(g + Dg_2)}{g + Dg_1} < 0$$

The results reveal that the credit unions' lending ability and capacity to attract deposits are inversely related to the commercial bank lending. This is likely to occur because both the credit unions and the commercial banks are now competing in the same loan and deposit markets. Again, in order to be able to lend more, the commercial banks have to attract more deposits. Consequently, the volume of deposits with the credit unions will decline.

### Effects Of An Increase In D\* On L And D

Similarly, on further differentiation with respect to D\*:

$$\begin{bmatrix} J \end{bmatrix} \begin{bmatrix} \frac{dL}{dD^*} \\ \frac{dD}{dD^*} \end{bmatrix} = \begin{bmatrix} Dg_2 \\ 0 \end{bmatrix}$$

Again, by Cramer's rule:

$$\frac{dL}{dD^*} = \frac{-(1-K)Dg_2}{g + Dg_1} < 0$$

and

$$\frac{dD}{dD^*} = \frac{-Dg_2}{g + Dg_1} < 0$$

The results show that the credit unions' volume of deposits is also negatively related to the commercial banks' volume of deposits. Mobilization of deposits in a larger volume by the commercial banks will cause a reduction in the availability of the credit unions' deposits. This, in turn, will also reduce the lending ability of the credit unions.

### PROFIT MAXIMIZATION

This section investigates the same issue under profit maximization subject to the availability of deposits. The optimization problem is thus set as follows:

Maximize:

Equation 7

$$\pi = (1 - K) Df(L, L^*) - Dg(D, D^*) - F$$

Subject to:

Equation 8

$$D = L + (1 - K)D$$

Equation (7) represents the total profit function. It is obtained by the appropriate substitutions of equations (1), (4), and (5). Here, the term  $(1 - K) Df(L, L^*)$  is a measure of total commercial loan revenue. Equation (8) specifies the deposit constraint. It limits the credit unions' lending ability.

Taking total differentials of equations (7) and (8) with respect to L and D:

Equation 9

$$\begin{bmatrix} -(1-K)Df_1 & g + Dg_1 \\ -1 & K \end{bmatrix} \begin{bmatrix} dL \\ dD \end{bmatrix} = \text{Exogenous Terms}$$

The determinant of the Jacobian (J) is:

$$(1 - K)KDf_1 + g + Dg_1 > 0$$

The comparative statics results are subsequently derived as follows.

### Effects Of An Increase In $L^*$ On $L$ And $D$

On further differentiation with respect to  $L^*$ :

$$\begin{bmatrix} J \end{bmatrix} \begin{bmatrix} \frac{dL}{dL^*} \\ \frac{dD}{dL^*} \end{bmatrix} = \begin{bmatrix} (1-K)Df_2 \\ 0 \end{bmatrix}$$

By Cramer's rule:

$$\frac{dL}{dL^*} = \frac{(1-K)KDf_2}{-(1-K)KDf_1 + g + Dg_1} < 0$$

and

$$\frac{dD}{dL^*} = \frac{(1-K)Df_2}{-(1-K)KDf_1 + g + Dg_1} < 0$$

Obviously, an increase in commercial banks' volume of lending will have contractionary effects on the credit unions' lending and deposit volumes for reasons mentioned earlier.

### Effects Of An Increase In $D^*$ On $L$ And $D$

Differentiating further with respect to  $D^*$ :

Equation 14

$$\begin{bmatrix} J \end{bmatrix} \begin{bmatrix} \frac{dL}{dD^*} \\ \frac{dD}{dD^*} \end{bmatrix} = \begin{bmatrix} -Dg_2 \\ 0 \end{bmatrix}$$

By Cramer's rule:

$$\frac{dL}{dD^*} = \frac{-KDg_2}{-(1-K)Df_1 + g + Dg_1} < 0$$

and

$$\frac{dD}{dD^*} = \frac{-Dg_2}{-(1-K)Df_1 + g + Dg_1} < 0$$

Again, the effects of an increase in the commercial banks' volume of deposits on the credit unions' commercial loan and deposit volumes will be contractionary.

## SUMMARY AND CONCLUSIONS

The results are summarized as follows:

Objectives	$\frac{dL}{dL^*}$	$\frac{dD}{dL^*}$	$\frac{dL}{dD^*}$	$\frac{dD}{dD^*}$
Cost Minimization	< 0	< 0	< 0	< 0
Profit Maximization	< 0	< 0	< 0	< 0

The comparative statics results under both cost minimization and profit maximization in a growing competition in markets for consumer loan and deposits confirm market interdependence between large credit unions and commercial banks.

Furthermore, it lends support to the hypothesis that in competitive consumer loan and deposit markets, the cost minimization and profit maximization behaviors yield similar results. Since both the markets are dominated by commercial banks in terms of market shares and there exists a market interdependency, synergy rather than rivalry ought to be a more sensible policy for credit unions to pursue.

## ENDNOTES

1. Federal Credit Union Act of 1977, Financial Institutions Regulatory and Interest Rate Control Act of 1978, Depository Institutions Deregulation and Monetary Control Act of 1980, and the Garn-St. Germain Act of 1982.
2. National Credit Union Administration.
3. Finance companies' share is 18 percent, and that of savings institutions is 5 percent. Others account for 18 percent as of February, 1992 (*Federal Reserve Bulletin*, April, 1992).
4. Deposits and loans are treated as input and output, respectively.
5. Cost minimization is appropriate for the analysis of scale and scope economies.

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