
ASSET-LIABILITY MANAGEMENT AT GEM STATE CREDIT UNION

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CASE DESCRIPTION

The primary subject matter of this case involves the use of GAP analysis to measure the interest-rate risk exposure of a credit union. Secondary issues examined include interest-rate changes in the economy overtime and the Fisher Effect. The case has a difficulty level appropriate for junior level students and is designed to be taught in about 45 minutes. This case could be used for classes in money and banking (economics), managerial economics, depository institutions management and possibly other management courses.

CASE SYNOPSIS

This case could be used to familiarize students with the balance sheet of a credit union and to understand the interest-rate risk that results from the nature of a depository institution's balance sheet. Students will also learn to calculate a GAP analysis for the credit union and to critically analyze the GAP methodology used by credit union management and are asked to offer an opinion on what this credit union could do to manage their interest-rate risk.

INTRODUCTION

Gem State Credit Union (GSCU) is a medium sized credit union located in the mountain west. In 2002, it had \$50 million in assets and a relatively healthy capital-to-asset ratio of around nine percent.

Increasingly, the National Credit Union Administration (NCUA) has emphasized that credit unions show that they understand interest-rate risk due to their asset/liability structure and that they are able to manage it. In their examinations of credit unions, they look in the board of directors' minutes for evidence that the board does monitor its asset/liability structure. Also, many credit unions now have an asset/liability management (ALM) committee that typically meet monthly to examine their asset/liability structure and recommend to the board any changes in interest rates or products that are needed to limit their interest-rate risk. GSCU soundly passed their annual NCUA examination in the spring of 2002. This case takes a closer look at the ALM analysis done by GSCU.

Les Norris has been the CEO of GSCU for the past 24 years, having brought it back from the brink of bankruptcy when he was hired in 1980. He is the chair of the ALM committee. Also serving on the committee are Ken Whitmore, VP of operations, John Harris, VP of lending, and Bob Thomas, chairman of the board of directors and president of G&T Economics, an econometric forecasting firm. Members of the ALM committee have worked well together for several years, but recent economic developments have caused a divergence in opinions as to how to set future rates.

WHY IS ASSET/LIABILITY MANAGEMENT NEEDED?

Depository institutions (DIs), which include banks, savings and loan associations and credit unions, have two major types of risks. *Credit risk* is the risk a DI takes when it makes a loan that may not be paid back in full. When a loan is not paid back in full the unpaid portion must be charged-off, which reduces the DI's capital and profits. DIs try to manage credit risk by screening and monitoring borrowers.

Interest-rate risk results in changes of profitability that a DI experiences from changes in interest rates in the economy. This risk is transmitted through their asset/liability structure, since asset yields and liability costs (largely interest paid on deposits) will have different sensitivities to interest changes.

For example, a classic case of interest-rate risk that caused major problems happened to savings and loan associations (S&Ls) in the 1980's. The major assets for S&Ls were home mortgages, which typically are long-term loans of 15 to 30 years. Also, all mortgages until the mid-1970's had fixed-interest rates, as most also have today. However, the major liabilities for S&Ls were savings deposits. Thus, the S&Ls had a maturity mismatch of assets and liabilities. Their assets had long-term maturities while their liabilities had short-term maturities and were much more interest rate sensitive.

As long as interest rates did not fluctuate much, S&Ls were stable. But, in the mid-1970s, inflation helped increase interest rates to record levels. This is due to the *Fisher Effect*: the nominal interest rate = the real interest rate + the expected rate of inflation. As inflation rose, so did the expected rate of inflation, which in turn increased the nominal interest rates. In addition, the Federal Reserve further raised interest rates by conducting a tight monetary policy in 1980 and 1982. Although S&Ls charged higher interest rates on new mortgages (peaking at more than 18 percent in 1982), they were stuck earning as little as five or six percent on the mortgages made in the past (some from the 1950s and 60s), but still on their balance sheets as income earning assets. At first, as interest rates rose in the mid and late 1970s, S&Ls could not pay higher rates on their deposits above 5 ½ % because of Regulation Q (a price ceiling that held them down). But, Regulation Q was phased out under the Depository Institution Deregulation and Monetary Control Act of 1980. As nominal interest rates rose, S&Ls had to pay higher rates on their deposits because they tended to be interest rate sensitive, while the mortgages made in past years continued to earn low rates. For

example, as S&Ls entered into 1982, their average cost of deposits was around 11.5%, while their average yield on mortgages was around 10.0%. Even not taking into account operating costs and charge-offs, their profits would have been negative during this time period. It is no wonder that many S&Ls failed in the 1980s.¹

Although the above S&L case maybe an extreme example of interest-rate risk, all DIs face some degree of interest-rate risk and must monitor their asset/liability structure. And, history of the last 50 years shows us the interest rates have been volatile and probably will continue to be at least somewhat volatile in the future. For example, three-month Treasury bills were about 1 % in the early 1950s, rose to over 15 % in 1981, fell to about 3 % in 1993, rose to over 5 % in the mid 1990s and in 2000, only to fall under 2 % in 2002 and then rose to around 4.75% by early 2006.

METHODS TO MEASURE INTEREST RATE RISK

Members of GSCU's ALM committee use standard industry practices to determine rates, as described below.

The most basic measure of interest-rate risk uses *gap analysis*. To find the gap, the analyst has to examine all the assets and liabilities and determine which ones are interest-rate sensitive. Rate sensitive means that the interest rate of the asset or liability will need to be repriced if interest rates change in the economy. The period examined is generally six months-to-one year, although longer time periods are occasionally examined. The "gap" is calculated by taking the interest rate sensitive assets (RSA) minus the interest rate sensitive liabilities (RSL). Equation one shows how the gap is computed in equation form:

$$\text{Gap} = \text{RSA} - \text{RSL}. \quad \text{Equation (1)}$$

The gap tends to be negative (RSA smaller than RSL) for most DIs, but DIs can also have positive gaps. A gap of zero is desirable, because that would indicate no interest-rate risk.

The gap can then be used to calculate effect of changing profitability on a DI resulting from changes in interest rates. The gap times the change in the interest-rate yields the effect on profitability. Equation 2 summarizes this:

$$\text{Profit Change} = (\text{RSA} - \text{RSL}) \cdot \text{D rate} \quad \text{Equation (2)}$$

This would be for a one-year examination period. If the examination period were for 6 months, then the profit change would equal the GAP times one-half the interest-rate change. For example, suppose a credit union has \$35 million in RSA, \$60 million in RSL, and over the next year, rates increase by two percent. Substitute these amounts into equation 2 to get:

$$\begin{aligned}\text{Profit change} &= (35 - 60) \cdot .02 \\ &= - \$.5 \text{ million}\end{aligned}$$

Hence, a rate increase of 2 percentage points would result in \$.5 million lower annual profits. Conversely, if rates went down by two percent, then profits would increase by \$0.5 million.

Basic gap analysis is often used, especially by smaller DIs, to monitor interest risk. This is the method GSCU uses. However, basic gap analysis can be further developed in a couple of areas (Mishkin, 2006, p. 221). According to Mishkin, "Clearly, not all assets and liabilities in the fixed-rate category have the same maturity. One refinement, the *maturity bucket approach*, is to measure the gap for several subintervals, called *maturity buckets*, so that effects of interest-rate changes over a multiyear period can be calculated. The second refinement, called *standardized gap analysis*, accounts for differing degrees of rate sensitivity for different rate-sensitive assets and liabilities." In addition to gap analysis, *duration analysis* is used by DIs to monitor interest-rate risk. The duration gap measures the weighted average of payments received from assets and payments made on liabilities over their duration.

GAP ANALYSIS AT GSCU

In a discussion of GAP analysis at GSCU, CEO Les Norris distributed Table 1 to members of the ALM committee. Table 1 shows the balance sheet for GSCU for November 30, 2002. On the asset side of GSCU's balance sheet, auto lending was the largest category, accounting for about \$26 million of its \$41 million of total loans outstanding. Real estate loans were a little over \$8 million, which were nearly evenly divided between fixed and variable-rate loans. However, nearly all of the real estate loans were secondary mortgages or home-equity-lines-of-credit, which tend to have much shorter maturities than do first mortgages. The secondary fixed-rate mortgages can have maturities for 15 years, but most have maturities of 10 years or less because the rates on fixed-rate mortgages go up enough after 10-year terms so that the variable-rate mortgages for the same term are about 2% less. In November 2002, the real estate portfolio had an average maturity of 99.8 months or about of 8.3 years. This average maturity for the mortgage portfolio tends to typically range from around 95 to 115 months. The other loan categories were other secured loans (RVs, etc.) at \$3.4 million, VISA credit card loans at \$2.6 million, and unsecured loans at \$1.3 million.

On the liability side, GSCU had just over \$46 million in total savings, which was distributed quite evenly among its different types of deposits. Regular passbook savings accounts was the largest deposit category at about \$17 million, followed by CDs at about \$13 million and checking and money market deposits at around \$9 and \$7 million respectively.

Traditionally, GSCU used a six-month examination period in its GAP analysis, where it would have to change rates on their rate-sensitive assets and liabilities if interest rates changed in the economy.

GSCU uses the following four categories to classify its rate-sensitive assets.

- ◆ *Rate-sensitive loans.* All of the variable-rate real estate loans are classified as rate-sensitive loans.
- ◆ *Loans that mature in six months.* These loans are calculated by first finding the average maturity of total credit union loans, excluding the variable-rate mortgages, and then dividing by six months. Then, this fraction is multiplied by total loans (less the variable-rate mortgages) to get the loans that mature in six months. In November 2002, the average maturity for all loans (less the variable-rate mortgages) was around 28 months. Hence, about 21 percent (6 months/ 28 months) of the total loans (less the variable-rate mortgages) will on average mature in six months.
- ◆ *Rate sensitive investments.* These investments mature in six months or less, and are almost exclusively overnight and other short-term investments at a corporate credit union (a credit union for credit unions). These would be essentially the investments that mature in one year or less since on the balance sheet since the investments in the 6-12 month category are very small in size.
- ◆ *Cash adjustment.* Cash adjustment is typically a relatively small figure and was a negative \$53,005 in November 2002. It is basically cash on hand (varies with deposits made and taken out) less what is needed in cash. It can be positive as well as negative, but is always very small relative to the total rate-sensitive assets. It will be negative if what is needed is greater than the cash on hand. Cash comes in and out as investments with the corporate credit union are made; excess cash is put in investments.

GSCU uses the three categories listed below to classify rate-sensitive liabilities.

- ◆ *Rate-sensitive deposits.* Ten percent of the checking and twenty-five percent of the savings deposits are rate-sensitive. IRA savings deposits are not included as rate-sensitive at all because they pay close to one-year CD interest rates and require careful planning and administrative preparation prior to a transfer
- ◆ *CDs that mature in six months.*
- ◆ *Money market deposits.* These last two categories assume that all CDs coming due during the examination period and all money market deposits are rate sensitive.

Following credit union industry consultants and other credit unions, GSCU has used the rule-of-thumb that about 10% of the checking deposits and 25% of the regular savings deposits are rate sensitive. That is, if interest rates increased in the economy and rates did not likewise increase on checking and saving deposits, then about 10 % of the checking and 25% of the savings deposits

would be moved to other types of deposits at the credit union that did have increased rates or leave the credit union all together. (Technically, a *standardized gap analysis* is used for this category). On this issue, members of the ALM committee were not in agreement. John Harris, VP of lending, believes that the 10%/25% rule underestimates rate sensitive deposits and hence underestimates the interest-rate risk of GSCU. He figures that if interest rates increase, GSCU will have to increase interest rates on all deposits to remain competitive in the local markets.

WHAT CAN GSCU DO TO MANAGE INTEREST RATE RISK?

Because of the nature of DIs, their major asset category, loans, tend to have longer maturities than their major liability category, deposits. Such is the case for GSCU. The members of the ALM committee also discussed how GSCU could try to change to rearrange its balance sheet to reduce the negative gap.

Les Norris suggested that GSCU could encourage its members to take out shorter maturity loans by increasing the difference between rates on the shorter and longer-term loans. He noted, however, that this may have only a limited effect on shortening maturities since the credit union members may prefer the longer-term loans that have lower monthly payments. GSCU could also try to encourage its members to make deposits in longer-term liabilities by increasing the difference on rates for shorter-term deposits (such as regular savings, money markets and short-term CDs) relative to long-term CDs. Conversely, if the gap happened to be positive, then the opposite actions to those above could help to reduce it.

Mr. Norris also noted that a second way for GSCU to try to reduce its negative gap is to price its loans to encourage members to take out more variable-rate loans. Variable-rate loans are most common with real-estate loans, but can also be used for other loans, such as auto loans. Variable-rate mortgages first appeared with California S&Ls in 1975. If GSCU could encourage more members to take out variable-rate mortgages (including secondary mortgages and home equity-lines-of-credit), then as interest rates rose, so would the rates that it receives on these mortgage loans.

Ken Whitmore, VP of operations, argued against this option, stating that although variable-rate mortgages do help DIs to reduce their interest-rate risk, they are still a limited help for a couple of reasons. First, these loans tend to have caps on how much the rates can change over the life of the loan. These are typically in the range of about three to five percent, in order to protect the consumer from getting into a situation where payments become too burdensome. So, if rates go up by a higher amount than the cap allows, the variable-rate loan will cover part, but not all the increased cost of interest rates paid on deposits. But, it is the second factor that has really limited how much variable-rate loans can help with interest-rate risk. This is simply the fact that most consumers tend to prefer fixed-rate loans because of the certainty of future loan payments. Mr. Whitmore felt that GSCU members would react in this way.

Table 1: Balance Sheet of GSCU, November 30, 2002

Assets	Dollars
Unsecured Loans	\$ 1,263,098
VISA Loans	2,554,055
Real Estate Loans, Fixed Rate	4,365,948
Real Estate Loans, Variable Rate	3,913,162
New Auto Loans	5,851,428
Used Auto Loans	20,240,311
Other Secured Loans	3,400,881
Total Loans	\$41,588,883
(Less) Allowance for Loan Loss	(197,622)
Liquid Investments (Matures less than 1 year)	4,806,182
Other Investments (Matures greater than 1 year)	1,815,140
NCUA Deposit Insurance Fund (NCUSIF) ²	446,136
Ownership in a Credit Union Service Organization	51,670
Net Fixed Assets	1,522,991
All Other Assets	223,681
Cash ³	596,995
Total Assets	\$50,854,056
Liabilities and Capital	Dollars
Savings Deposits	\$16,419,548
Money Market Deposits	6,904,995
Checking Deposits	8,807,074
IRA Savings Deposits	1,051,961
CDs that Mature in 6 Months	5,812,083
CDs that Mature in More Than 6 Months	7,059,585
Total Deposits	\$46,055,246
Other Liabilities (Such as Accounts and Interest Payable)	209,571
Total Capital or Equity (Reserves plus Undivided Earnings)	4,589,239
Total Liabilities and Capital	\$50,854,056

ENDNOTES

- ¹ Although the major underlying problem was this mismatch of assets and liabilities, other factors played a part in causing the S&L crisis. This includes poor supervision by both the federal and some state regulatory authorities and as well as some fraudulent and criminal behavior by some S&Ls. Probably the most recognized case of S&L scandal was Lincoln S&L ran by CEO Charles Keating, Jr.
- ² The NCUA Deposit Insurance Fund is kept at NCUA for deposit insurance with no interest. This is similar to FDIC insurance premiums for bank and S&L deposits.
- ³ Reserve requirements are 3% of the first \$47.6 million in checkable deposits, and 10% of deposits over that amount (Mishkin, page 405). Gem State's cash (\$596,995) more than meets its reserve requirement of \$264,212 (or 3% of \$8,807,074). Reserve requirements may consist of cash at the credit union or non-interest bearing deposits at the Federal Reserve.

REFERENCES

- Mishkin, Frederick S. (2006). *The Economics of Money, Banking, and Financial Markets. 7th edition*. Reading, Massachusetts: Addison-Wesley.