

# Structural Risk Management (Asset/Liability Management) (ALM)

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## **Executive Summary**

The goal of asset/liability management (ALM) is to properly manage the risk related to changes in interest rates, the mix of balance sheet assets and liabilities, the holding of foreign currencies, and the use of derivatives. These risks should be managed in a manner that contributes adequately to earnings and limits risk to the financial margin and member equity.

Proper management of asset/liability risk is facilitated through board approved policy, which sets limits on asset and liability mix, as well as the level of interest rate risk and foreign currency risk to which the credit union is willing to expose itself. Policy should also set out guidelines for the pricing, term and maturity of loans and deposits. The use of derivatives, if any, should also be controlled by policy, which should state among other things that derivatives must only be used to limit interest rate risk and must never be used for speculative or investment purposes.

Credit unions which offer either fixed rate loans or deposits will mitigate interest rate risk by ensuring that management is properly measuring risk. The standard measure of this risk is balance sheet gap, and it is essential that management measure this regularly. Techniques for measuring, monitoring and reducing interest rate risk are covered in depth in this chapter.

A credit union can meet standards of sound business and financial practices by ensuring it has developed and implemented asset/liability board policies, risk and performance measurement techniques, and risk management procedures comparable to those contained in this chapter. Policies, measurement techniques and procedures should be appropriate for the size and complexity of the credit union's operation.

## Legislative Summary

Legislation relevant to ALM mainly deals with the management of interest rate risk (refer to Part IX of Regulation 76/95). Legislation also prescribes limits on various asset/liability categories (refer to Part VIII of Regulation 76/95). Finally, FSCO prescribes guidelines on the use of derivatives.

Provided below is a summary of the legislation as it pertains to ALM. As only a summary is provided, readers should refer to the Act, Regulation 76/95 and relevant FSCO guidelines for a complete description of a credit union's regulatory rights and obligations.

<b>Schedule 7.1 RELEVANT ALM RELATED LEGISLATION</b>	
	<b>Regulation 76/95</b>
Interest rate risk (IRR) management defined	77
IRR policies and procedures	78(1)
Regulatory shock test	78(2),(3)
Reporting requirements	78(4),79(2),80
IRR corrective action	79(1)
Also refer to FSCO's guideline on Accounting Principles for Derivative Instruments.	

### Balance Sheet Volumes/Mix

There are various regulatory requirements relating to the maximum category size of certain types of assets (e.g. commercial, agricultural loans) and investments (e.g. share stocks, subsidiaries).

For these limits, refer to the relevant sections of Regulation 76/95 and Sections of this Reference Manual identified in the Schedule 7.2.

<b>Schedule 7.2 BALANCE SHEET VOLUME AND MIX: RELEVANT REFERENCES</b>		
<b>Refer to:</b>	<b>Regulation 76/95</b>	<b>Reference Manual</b>
Regulatory Lending Limits	51 - 63	5101
Regulatory Investment Portfolio Limits	64 to 67	6101
Regulatory liquidity requirements	16 to 21	8101

## Interest Rate Risk

In order to assist a credit union in the control of interest rate risk, section 78 of Regulation 76/95 requires the establishment of minimum policies and procedures to address:

- exposure to interest rate risk;
- techniques to measure interest rate risk;
- internal controls;
- corrective action for high levels of exposure;
- reporting requirements.

The limits on the exposure of the credit union to interest rate risk should be designed to complement the organization's overall risk profile (e.g. capital adequacy, liquidity, loan quality and investment risk).

Examples of ALM policy are available in DICO Sample Board Policies, which have been published by DICO and are available to the industry for review, customization and elective adoption.

### Section 78(2) Shock Test

Subsection 78(2) of Regulation 76/95 sets out a maximum limit on interest rate risk exposure, as measured by an earnings shock test. The shock test measures the extent to which a “likely change” in interest rates (both higher or lower) affects a credit union's net interest margin. The earnings limit established under subsection 78(2) is set at 0.15 per cent or 15 basis points of total assets. An acceptable estimate for a “likely change” in interest rates is 1 per cent, however, a credit union is free to use another rate of change, so long as it may “reasonably be expected to occur” (section 78(3) of Regulation 76/95).

The Act requires a credit union to prepare a quarterly report for the board on its management of interest rate risk, setting out all the information that the deposit insurer requires to be reported in its statistical returns. These reports should contain a supported statement of opinion by management as to whether the credit union is currently in compliance with the board's policy on interest rate risk.

A credit union which exceeds the preliminary limit for income for two consecutive quarters is required under Regulation 76/95 to submit to the Superintendent of Financial Services and to DICO a board plan, that describes the steps the credit union intends to take to bring itself within those limits. (See section 79(2) of Regulation 76/95).

### Use of Derivatives

A credit union may only enter into derivative contracts for hedging purposes and to manage interest rate risk (section 66 of Regulation 76/95). Credit unions, therefore, cannot enter into derivative contracts for income speculation purposes.

Accounting methods for derivatives must satisfy regulatory requirements outlined in FSCO's Accounting Principals for Derivatives Instruments.

## Policy

It is recommended that the credit union adopt an asset/liability management policy (ALM policy) that addresses:

- limits on the maximum size of major asset/liability categories;
- pricing loans and deposits;
- correlating maturities and terms;
- controlling interest rate risk and establishing interest rate risk measurement techniques;
- controlling foreign currency risk;
- controlling the use of derivatives;
- requiring management analysis and expert consultation for derivative transactions;
- frequency and content for board reporting.

These recommended objectives of ALM policy are discussed in greater depth below. Adopting an ALM policy will assist the credit union to manage risk and to comply with the Standards in DICO By-law No. 5. For recommended operational procedures, refer to Section 7500.

### Reference Materials

Examples of ALM policy are available in the DICO publication Sample Policies, and are available to the industry for customization as appropriate. As well, the information provided in Sections 7201 to 7210 will also assist in establishing ALM policy.

### Regulatory Compliance

ALM policy must not conflict with requirements prescribed by the Act and Regulations, and any relevant interpretive bulletins or guidelines issued by FSCO. It is optimal for key regulatory requirements to be repeated in ALM policy, for greater user clarity and ease of reference.

Section 78(1) of Regulation 76/95 also requires credit unions to establish ALM policies and procedures. FSCO's policy and procedure guidelines differ slightly with the policy and procedure requirements of By-law No. 5. When establishing ALM policies and procedures, management and the board should ensure they meet FSCO requirements as well as By-law No. 5 requirements. In addition to By-law No. 5 policy criteria and FSCO criteria, credit unions may elect to establish other ALM policies as they see fit.

## **Asset/Liability Management Philosophy**

Adopting an asset/liability management philosophy is an important first step in drafting ALM policy. The philosophy should set out the broad goals and objectives of the credit union's asset/liability portfolio, as established by the board of directors, who represent the membership at large. This philosophy governs all ALM policy constraints and helps address new situations where policy does not yet exist.

While goals and objectives will differ depending upon the circumstances and environment of the credit union, the ALM philosophy should always address the following principles:

- The credit union will manage its asset cashflows in relation to its liability cashflows in a manner that contributes adequately to earnings and limits the risk to the financial margin.
- Product terms, pricing and balance sheet mix must balance members' product demands with the need to protect the equity of the credit union.
- Financial derivatives instruments must only be used to limit interest rate risk and must never be used for speculative or investment purposes.

## Balance Sheet Mix

ALM policy should establish portfolio limits on the mix of balance sheet liabilities such as deposits and other types of funding, as a percentage of total assets, considering the differential costs and volatility of these types of funds. Similarly, prudent portfolio limits on the mix of balance sheet assets (e.g. loans by credit category, financial instruments, etc.) should be set by policy considering differential levels of risk and return.

This recommended practice may not be practical for smaller, less complex credit unions which have a limited membership base, a simple balance sheet without much product diversification (e.g. savings and personal loans) or which do not have sufficient financial resources to effectively promote diversification. If this is the case, ALM policy should state that an appropriate mix of deposits and other liabilities will be maintained to reflect member expectations and to correlate (by term and pricing) to the mix of assets held. The mix of assets (loans, investments) return should be guided by annual planning targets, lending licence constraints and regulatory restrictions on investments.

Schedule 7.3 illustrates a sample schedule of policy limits for balance sheet mix that may be used by larger credit unions. These credit unions must be able to manipulate business to stay within prescribed policy constraints. For example, if a credit union chooses to limit its personal loans to 40 per cent of its total assets, it must be large enough and have the financial capacity to do so (i.e. it must be able to turn away, if necessary, loan requests that constitute higher risk without jeopardizing overall membership). Policy limits should be realistic (based on historical trend analysis) but also effective in terms of shaping overall business so as to maximize future viability and market competitiveness of the organization.

<b>Schedule 7.3</b>	
<b>SAMPLE BOARD POLICY LIMITS ON THE SIZE OF SPECIFIED ASSET/LIABILITY CATEGORIES</b>	
<b>Categories</b>	<b>Policy Limits as a Percentage of Total Assets</b>
<b>Assets</b>	
Commercial loans	10.0%
Agricultural loans	0.0%
Personal loans	20.0%
Residential mortgages	40.0%
Financial investments (including assets held for liquidity)	20.0%
Other investments	7.0%
Capital assets	<u>3.0%</u>
	<b>100.0%</b>
<b>Liabilities</b>	
Term deposits	50.0%
Demand deposits	35.0%
Foreign currency	3.0%
Brokered deposits	10.0%
Liquidity borrowings	<u>2.0%</u>
	<b>100.0%</b>
<p>This schedule sets limits on the maximum size of certain balance sheet categories in order to diversify risks and returns. These are sample limits and are offered for illustrative purposes only.</p>	

## Managing Liabilities

This Section provides direction on setting policy constraints on the size and types of deposits and borrowings so as to minimize the cost of funds and maximize opportunities to finance growth.

Sources of funds for a credit union can be summarized into three types: capital, deposits and borrowings. Refer also to Chapter 4 on Capital Management for more details on managing funds from capital sources.

### Strategy

Schedule 7.4 summarizes the various strategies which management may adopt in building its liability base.

<b>Schedule 7.4</b> <b>ALTERNATIVE ASSET/LIABILITY MANAGEMENT STRATEGIES</b>
<ul style="list-style-type: none"> <li>• Attract loans to meet deposit supply.</li> <li>• Attract funds to meet loan demand.</li> <li>• Adopt a mixed approach in order to match the maturity structure of liabilities with the maturity structure of assets at the cheapest cost.</li> </ul>

As highlighted above, the first approach, reflecting deposit driven growth, generally results in limited satisfaction of members' long term lending needs because of depositors' preference for short term instruments. The approach can result in excess liquidity and reduced earnings for the credit union.

The second approach, which reflects asset driven growth, results in higher than average funding costs because of the need to guarantee financing to borrowers, which may necessitate funding by external borrowings. Both strategies may cause an unfavourable divergence from market rates.

Due to the major disadvantages inherent in the deposit driven and the asset driven strategies, a compromise approach to liability management is recommended. The credit union should rely on natural deposit growth, fostered through competitive "at market" interest rates, in order to influence loan pricing and growth.

Loan demand which exceeds the natural deposit base can be filled through limited price stimulus on deposits, assuming sufficient profitability. Term deposits, for example, may be offered at higher rates than demand deposits in order to finance the demand for longer term assets such as mortgages. Long term deposits (e.g. two to five years) should generally be sought if term mortgage loan business is available. Alternatively, an interest rate swap or a long term investment can be purchased to match against term deposits. Interest rate swaps and other derivative instruments are discussed in more depth in Section 7210.

Alternatively, if loan growth has increased beyond the natural growth of deposits, the ALM policy could encourage the solicitation of new members with deposits who otherwise would not meet the bond of association (this may require a revision to the membership by-law). Persons normally ineligible for membership could become members under the basket membership clause of section

31 of the Act (to a limit of three per cent of total members). Deposit accounts to pursue could include community agencies which generally have an interest in improving community relations. If loan growth continues to exceed natural deposit growth, then loan syndication, asset sales, asset securitization or loan referrals involving other co-operative institutions should be addressed by ALM policy. Under the statute, credit unions cannot accept the deposits from members of other credit unions, although they can consider taking brokered deposits. This strategy, however, is generally a high cost alternative and not a recommended practice over the long term. (Brokered deposits are covered later in this Section).

### Term Deposits

The following operational policy alternatives should be considered for cost effective management of the deposit base of a credit union. These strategies should be evaluated in light of corporate philosophy and members' service expectations.

- Offer a three or four tiered deposit rate structure for term deposits in excess of certain dollar thresholds (e.g. \$1,000, \$5,000, \$10,000) to avoid paying a premium rate on all deposits.
- Offer an attractive first year rate on term deposits with a “wait and see” clause for subsequent annual rates.
- Establish minimum monthly balances for short term deposits, which pay higher rates to rate sensitive members without raising the cost of all funds in these accounts.
- Adopt a policy of substantial penalties for premature term deposit withdrawals in order to maximize available funds.
- Offer non-callable deposits at a premium over callable deposits with like terms, for the same purpose.
- Alternatively, offer callable deposits subject to a penalty equivalent to the applicable interest rate differential. Establish reasonable flat or volume driven service charges or termination fees for the operation of deposit accounts to offset interest costs.
- Establish in policy the requirement for periodic measurement and analysis of the cost of funds of various deposit accounts to determine those deposit categories which may not be cost effective, and which should be redesigned or discontinued.
- Require in policy the manager's authorization for any substantial deposit withdrawals in order to give the manager an opportunity to determine if and why funds are being transferred by members to other financial institutions.
- Require in policy or operational procedures, how various deposit accounts are designed to operate to effectively meet different members' needs; e.g. chequing accounts, chequing savings, daily interest chequing, regular savings, RRSP's, RRIF's, OHOSP's etc. These various accounts should be analyzed in terms of their sensitivity to interest rate change and promote those accounts with low interest rates and low sensitivity to rates.
- Establish in policy or operational procedures ongoing monitoring of the amount of variable and fixed rate deposits (where applicable) through a perpetual inventory system. Staff should prepare a periodic (e.g. weekly) treasury report indicating the availability of funds in the variable and term categories. Funding categories may be labeled as "excessive", "sufficient" or "low" so that loans with appropriate maturities and rates may be promoted by staff to match deposits.

- The volume of deposits in categories where loan demand is scarce can be discouraged by unattractive deposit pricing. This practice may cause membership flight and other alternatives such as interest rate swaps should be considered to manage members demand for term loans. Refer to Section 7502 for an explanation of interest rate swaps.
- In accordance with section 181 of the Act, operational policy should require deposit accounts to never be overdrawn. Delinquent overdrafts can increase funding costs significantly, and thus must be prohibited.

### **Diversification**

In addition to minimizing the cost of its deposit base, the credit union must promote the stability of its deposits. In this regard, policy should encourage the diversification of members' deposits by origin and term structure. Operational policies should encourage that funding is not unduly concentrated with respect to:

- an individual member;
- market source of deposit (e.g. commercial versus personal);
- deposit term to maturity;
- foreign currency.

Concentrated funding sources expose the credit union to potential liquidity problems because of the likelihood of unexpected deposit withdrawals. Credit unions with excessive funding concentrations should maintain additional liquid assets. Refer to Chapter 8 for further recommendations on Liquidity Management.

### **Brokered Deposits**

Brokered deposits are funds referred for deposit to a credit union through an investment/deposit broker. The credit union typically solicits these deposits from local investment agents and brokers (usually for an introduction fee) in order to finance unexpectedly high loan demand. New depositors, via arrangements with a broker, will invest in a credit union because they may receive a higher rate of return than other financial institution deposits.

Brokered deposits can benefit credit unions which need immediate deposit financing to fund loan growth. However, there are risks when relying on brokered deposits. The credit union may need to:

- pay finder fees/commissions to the deposit broker;
- pay higher interest rates to attract brokered deposits;
- manage greater liquidity risk due to more volatile deposit re-investment behaviour;
- ensure the deposits are properly administered for deposit insurance purposes.

Brokered deposits generally represent a more expensive source of funds owing to potential fees and higher interest rates. Additionally, they are usually larger in size than other deposits and liquidity problems could result if large brokered deposits were suddenly withdrawn from the credit union on maturity.

With respect to administration for deposit insurance purposes, in order for any Canadian currency deposit to be eligible for deposit insurance, the depositor must qualify as a member (per the bond or the three per cent basket membership clause) and hold the prescribed number of shares as outlined in the credit union's by-laws.

In summary, brokered deposits represent a high-cost source of funds that should be regarded as temporary until more permanent financing arrangements can be put in place. When reviewing alternatives for temporary financing, credit unions should also consider league borrowings.

### **Borrowings**

In addition to the deposit base, credit unions may rely on external league/bank borrowings to finance their asset portfolio. Since external borrowings may be a more expensive source of funding, policy should require limited reliance on these borrowings, and observance of the regulatory ceiling on league borrowing. External loans should always be viewed as temporary financing. Lines of credit with leagues or other financial institutions, however, should be established in order to regulate operational liquidity; refer to Chapter 9 on Liquidity Management for further information.

## Managing Assets

This Section provides direction on setting policy constraints on the size and types of loans and investments so as to make the best use of available funds, maximize financial margin while maintaining an appropriate level of safety. The assets of a credit union can be classified into two broad categories: earning assets and non-earning assets. ALM policy should promote the maximization of earning assets which reward the credit union for its operating risks. Earning assets are those assets which generate direct revenues for the credit union. Refer to Schedule 7.5 for a sample classification of assets in each category.

<b>Schedule 7.5 CLASSIFICATION OF ASSETS</b>	
<b>Earnings Assets</b>	<b>Non-earning Assets</b>
<ul style="list-style-type: none"> <li>• Productive Loans</li> <li>• Short Term Investments</li> <li>• Long Term Investments</li> </ul>	<ul style="list-style-type: none"> <li>• Cash on Premises</li> <li>• Non-accrual Loans</li> <li>• Payroll Receivables</li> <li>• Pre-paid expenses</li> </ul>

Non-earning assets should therefore be minimized, i.e. investment in cash, non-accrual loans/investments and capital (e.g. fixed) assets.

Under Regulation 76/95, there is a requirement for credit unions to maintain a certain amount of its assets in liquid form. This liquidity need not be held in cash, but can be in the form of callable deposits of a league or a Canadian chartered bank/trust company (see section 16 of Regulation 76/95). Despite the legal flexibility, surplus cash is often left on the premises of a credit union rather than being placed into interest bearing accounts.

Operational procedures should limit the maximum amount of cash left on premises. High teller floats or ATM balances, excessive funds in transit (e.g. balances that are not cleared daily for deposit with the league), or idle cash in non-interest current accounts will increase the amount of non-earning assets and lower financial spread. In the case of teller floats or ATM balances, operational procedures should set maximum limits that can still accommodate members' needs.

Members' needs should be determined by a historical review of cyclical fluctuations in daily cash deposits/withdrawals, and estimates of future requirements. By decreasing surplus cash, management can increase financial margin; if cash balances can be reduced, for example, by \$100,000, at a reinvestment rate of three per cent, annual net income will improve by \$3,000.

With respect to other non-productive loans and investments, it is recommended management move quickly to identify and liquidate any assets which bear unrewarded risk (e.g. non-accrual loans or non-income producing capital assets).

The best contributor to earning assets in a credit union are productive loans; these assets presumably earn the highest yields. In order to maximize financial margin, ALM policy should require management to periodically measure and compare the gross yields for various asset categories (e.g. mortgages, personal loans, business loans, etc.) and maximize volumes in the most profitable categories without attracting unsatisfactory levels of risk. Refer to Section 7202 for setting policy limits on various asset and liability categories.

## Pricing

ALM policy specifies that the pricing of all loans and deposits offered should be established so that overall, a net contributions to earnings is provided.

In order to ensure that deposit and lending rates are sufficiently responsive, policy may delegate to management the authority to set interest rates without board approval but in accordance with pre-established criteria as described below.

### Deposit Pricing Policy

Rates offered on deposits should be tied to external benchmarks in the local market and should generally approximate the average of these market indicators (for example, the bank rate or the prime rate). Policy should allow management flexibility to negotiate more favourable rates within a prescribed range to maintain key deposit accounts. In order to protect financial margin, credit unions should avoid engaging in price wars with competitor financial institutions including other credit unions. Pricing strategies of competitor institutions will reflect the need for funds in these organizations. Liquidity requirements of the competitor institution may differ vastly from the credit union's needs; therefore, caution should be exercised when setting rates.

### Loan Pricing Policy

It is recommended that loans be priced at market rates, and subject to interest rate rebates only at the end of the year, if sufficient earnings and reserves are available. The interest rates offered on loans should reflect an adequate margin above the rates on deposits being used to fund loans, in order to cover all operating expenses and capital requirements.

Loan pricing can also be used to balance minor gap mismatches. Where funding from deposits is high for a particular term of loan, the price for these loans could be made more attractive than terms whose funding sources are scarce. For larger gap mismatches, however, a derivative instrument may be a more practical option. (Refer to Sections 7210 and 7502 for more information on derivatives).

Loan pricing is crucial for establishing a successful lending program. In order to establish fair interest rates for both the borrower and the credit union, the following factors should be considered: Cost of funds and the spread required for financing the loan.

- Market rates offered by the competition.
- Excess liquidity position of the credit union.
- Maturity and repayment terms of the loan.
- Credit risk of the loan (e.g. loan purpose, size and security).
- Length of loan amortization period (generally, the longer the period, the higher the rate).

### Share Pricing Policy

When issuing capital shares, discretionary dividend rates should be subject to ALM policy criteria approved by the board. Dividend rates should be set with due regard to the average cost of alternative funds such as deposits, other classes of shares and borrowings. When stock dividends are offered as an alternative to cash dividends, the future costs of increased fixed dividends should be analyzed for ongoing affordability, before stock dividends are declared. Refer to Section 4204 on Distribution of Earnings.

## Terms

ALM policy should set reasonable limits on the terms of loans and deposits. These limits should be broad enough so that management can set varying terms for individual products in operational procedures based on product purpose, so long as these do not exceed the maximum term limits approved by the board.

There are no regulatory requirements for the maximum term on any assets or liabilities which a credit union can assume.

### Term Deposits

It is recommended that the board establish maximum term limits on term deposits. Operational procedures can describe the availability of alternative term deposits and correlate differential pricing for these products within this limit.

The board may want to set a general five year maximum term on deposits in policy, and require that any products with terms greater than five years require special board approval.

### Term Loans

It is recommended that the board establish maximum term limits on term loans. Operational procedures can describe the availability of alternative term loans and correlate differential pricing for these products within this limit.

The board may want to set a general five year maximum term on loans in policy, and require that any products with terms greater than five years require special board approval.

### Operational Procedures

The criteria for offering term loans of varying length can be specified in operational procedures. Operational procedures can require that loan terms be set to similar lengths as the life of the security (e.g. large loans secured by higher valued assets would normally have longer terms to maturity). Due to the higher repayment and security risks of longer term loans, and the usually limited consumer demand for term deposits in excess of five years, it is recommended that generally, term loans be offered with five year maximum maturities.

For increased competitiveness, however, loan maturities in excess of five years may occasionally be sanctioned up to a prescribed policy limit or approved by the board on an exception basis.

Mortgage terms of seven to ten years have become more commonplace in the market but generally should only be offered by credit unions if arrangements are in place to manage the gap between five year funding deposits and those longer term mortgages. Credit unions should consult with their league for appropriate strategies prior to offering extended term mortgages.

Term loans should be substantially matched by contractual maturity dates against non-callable term deposits. For mortgages with terms exceeding one year, selective prepayment penalties should be established by operational policy.

## Interest Rate Risk

Interest rate risk is the risk of an impact on an institution's earnings and capital due to changes in interest rates. One of the primary causes are mismatches in the terms of a credit union's deposits and loans.

Interest rate risk should be periodically measured, and can be controlled through proper management or matching of the institution's assets and liabilities. (Matching is discussed in the next Section).

### Exposure to Interest Rate Risk (IRR)

#### *Earnings Impact Measure*

ALM policy establishes limits on the amount of interest rate risk exposure a credit union is willing to assume. Exposure is normally expressed as a change in potential earnings caused by a likely fluctuation in interest rates; this is an earnings impact measure of interest rate risk.

#### *Regulatory Maximum Exposure*

Subsection 78(2) of Regulation 76/95 prescribes a maximum limit for interest rate risk exposure. This limit is described in Section 7101 of this Reference Manual.

### Measuring IRR

In order to ensure that exposure to IRR remains within policy levels, the credit union will need to periodically measure its exposure to interest rate risk caused by asset/liability mismatches.

IRR must be measured at least quarterly. It is recommended that institutions with fixed loans or deposits greater than 10 per cent of total assets measure this exposure on a monthly or weekly basis. Some of the more common techniques for measuring interest rate risk are discussed in more depth in Section 7404 on Interest Rate Risk Measurement.

### Corrective Action

Where interest rate risk exposure is above policy limits or regulatory limits, management must initiate timely corrective action to deal with the exposure and restore compliance with policy and with section 79(1) of Regulation 76/95. Corrective action is discussed in more depth in Section 7500 on Risk Management.

## **Matching Maturities**

Policy should require that, as much as possible, liability maturities and cashflows correlate to asset maturities and cashflows.

"Matching" refers to the process of structuring the balance sheet so that maturities of interest rate sensitive assets correspond closely to the maturities of interest rate sensitive liabilities. If the balance sheet is well-matched, a change in interest rates will have little or no impact on margin, because assets and liabilities re-price at the same time. The better a credit union is matched, the more likely it is to have stable profits.

The periodic measurement of interest rate risk exposure (introduced in Section 7207) will quantify the extent of balance sheet mismatch. Techniques for measuring interest rate risk are covered in Section 7404 of this Reference Manual.

Balance sheet mismatches can be corrected through the use of traditional portfolio manipulation techniques (discussed in Section 7502). Alternatively, financial derivative instruments can be put into place to hedge against cashflow mismatches. (Refer to Section 7210 and 7502 for a discussion of financial derivative instruments).

## Foreign Currency Risk

Fluctuations in the value of foreign currency investments or deposits can pose a risk to credit union earnings. ALM policy should define the maximum amount of permissible unhedged foreign exchange risk and require that this be monitored closely. The monitoring and management of foreign currency risk should also be addressed by ALM policy. The volume of foreign currency deposits accepted by a credit union should be minimal relative to Canadian fund deposits, due to ineligibility for deposit insurance.

### Monitoring Exposure

Where a significant amount of foreign currency liabilities are held by the credit union, the Canadian dollar impact of unrealized gains or losses of these liabilities should be measured and disclosed to the board at least quarterly. Where the level of foreign liabilities is significant, measurement/monitoring of exposure should be undertaken on a more frequent basis (e.g. monthly, weekly, depending upon the size of the holdings). Additionally, the credit union could estimate foreign exchange exposure assuming a range of currency exchange fluctuations.

### Hedging Foreign Exchange Risk

Policy should require that significant amounts of foreign currency deposits be matched against loans or investments in the same currency and with the same term. As deposits compound in size as a result of interest payments, foreign currency risk associated with interest payments can only be eliminated by arranging the same magnitude and timing of income flows from offsetting foreign currency loans and investments. Provincial leagues and brokers normally make available to credit unions a variety of foreign currency investment vehicles. The repricing terms offered and the available liquidity on foreign currency investments should be considered prior to offering foreign currency deposit services to members.

### Derivative Financial Instruments

Policy could also authorize the use of external hedging instruments, i.e. derivatives, which could be purchased to eliminate material unhedged foreign exchange risk. Such instruments include spot transactions, forward purchases, and cross currency swaps. (Refer to Sections 7210 and 7502 for more information on derivatives financial instruments.)

## Financial Derivatives

It is a sound business and financial practice for a credit union to use financial derivatives to hedge the balance sheet and manage interest rate risk, where the level of exposure outweighs the derivative transaction costs.

A derivative instrument is a financial contract whose value fluctuates in relation to the performance of an underlying asset or market index (e.g. a debt or equity security, stock market index, interest or foreign exchange rates). These instruments can enable a credit union to reduce gap mismatch, or set up a hedge against fluctuations in interest rates or foreign exchange rates.

### Derivatives Policy

The use of derivative instruments should be either prohibited or authorized in the ALM policy itself. Where the use is authorized in policy, then policy should also address the following parameters of derivative use:

#### ***Policy Objectives***

Policy should define the purpose for relying on derivatives, whether they will be used to manage interest rate risk within regulatory limits, or whether they will be used to hedge (i.e. eliminate) specified types of risk (e.g. foreign currency risk).

Policy must prohibit the use of derivatives for speculative purposes.

#### ***Authorized Instruments***

Policy shall optimally state the instruments which management is authorized to use in implementing hedging strategies, including any prohibitions. (Schedule 7.12, found in Section 7502, contains a survey of common derivative products). Credit unions should generally avoid the use of writing options, puts or calls, as they are extremely risky instruments.

ALM policy can also specify the amount, term and nature of permissible coverage, or even establish the volume and risk limits for derivatives.

#### ***Expert Consultation***

The derivative policy should require the credit union to obtain expert advice and analysis before entering into a derivative transaction. Expert advice should include consultation with external financial advisors whenever derivatives for a particular purpose are first purchased and until management acquires significant in house expertise.

It is recommended to seek such advice from a league. If brokers are used by the credit union, a list of approved brokers for derivative transactions should be created.

#### ***Purchase Authorization***

The policy must define appropriate authorization for entering into derivative instruments, and require transactions to be made only with the credit union's league or from approved brokers.

#### ***Board Approval***

To ensure the proper use of derivatives, derivative transactions should be reported to the board at the first board meeting following their transaction, so that the board can ensure these transactions

were entered into for either interest rate risk management or for hedging purposes, in accordance with the Act.

When the board determines that the transaction was entered into for hedging purposes, the board will pass a declaration stating that fact. Where the board believes the transaction is for a purpose other than permissible interest rate risk management or hedging, management must be directed to unwind the transaction, or where this would cause significant economic harm, management should be instructed to hedge that derivative transaction.

### **Monitoring Derivatives**

The policy must mandate the appropriate monitoring of derivative transactions and positions. Monitoring includes periodic measurement (at least quarterly) of derivative market values if material. Measurements must be made in accordance with generally accepted accounting principles, and FSCO's Accounting Principles for Derivative Instruments. Monitoring should consist of:

- appropriate contract documentation;
- reliable systems for measuring risk;
- monitoring processes that are independent of the employees authorized to invest in derivatives;
- appropriate accounting treatment and disclosure.

Policy should specify the corrective actions to be taken to unwind or neutralize derivative transactions, or appropriate contingency plans for unexpected balance sheet or interest rate developments.

### **Survey of Derivative Instruments**

Refer to Schedule 7.12 in Section 7502, which lists various derivative instruments that may be used by credit unions to manage interest rate risk.

## **Planning**

Annually, management and the board of directors must develop an business plan, summarizing the credit union's goals and objectives for the coming year.

This annual business plan includes a strategic financial plan that addresses each area of risk management, including asset/liability management. As part of the strategic financial plan, management and the board must set financial targets and plans for asset/liability management. The elements of a asset/liability management plan are set out in Chapter 1 on Planning, and should be referred to for planning purposes.

## Risk Measurement and Board Reporting

It is recommended that the credit union measure the performance and risk level of the credit union's asset/liability management activities, and report these findings to the board.

### Risk Measurement

The following are minimum risk and performance measures of ALM, required by sound business and financial practices:

- Periodic measurement of overall balance sheet mix.
- Periodic measurement of asset, liability and capital growth or decline.
- Periodic measurement of operational cash flows.
- Periodic measurement of financial margin.
- Periodic measurement or projection of the impact of interest movements.
- Periodic measurement of the level of unhedged foreign currency funds.
- Periodic assessment of the appropriateness of financial derivatives held.

The credit union must also meet ALM measurement requirements set out in the Act and Regulations. The credit union may track any other measures of the loan portfolio as it sees fit.

These measurements should be compared to financial targets in the annual business plan and the budget, so that management can determine whether the credit union is meeting its goals. Management can also assess whether there are material variances from the plan which need to be addressed.

Comparison of these measurements against historical performance, where possible, can also identify significant trends which may need to be addressed by management.

### Risk Management Techniques

Sections 7401 to 7405 provide techniques for measuring and monitoring the adequacy of the credit union's ALM activities.

### Board Reports

The above measurements should be reported to the board of directors, so that the board can also monitor ALM activities and ensure adherence to regulatory requirements and to the annual business plan. Material variances from plan, and their causes, as well as management's plan to correct the variance should also be included in the report. Management should also provide the board with a summary on compliance with ALM policy and relevant regulatory requirements.

### Frequency

Management should provide the board with a report on the ALM portfolio at least quarterly.

### Form

Schedule 7.6 on the following page illustrates a Sample Board Report on ALM Management, which can be used by management to monitor the credit union's ALM activities, ensure regulatory compliance and report findings to the board. The report compiles and compares the important

measures of asset and liability portfolio mix, interest rate risk, foreign exchange risk and derivatives use. This report can be adopted or amended for use by the credit union.

Information contained in the report can be expressed on a periodic basis (monthly, quarterly), or on a year-to-date, or both, depending upon the preferences of the board and the frequency of reporting.

The frequency, form and content for board reports on ALM activities should be set out in ALM policy.

<b>Schedule 7.6</b>					
<b>SAMPLE BOARD REPORT ON ASSET/LIABILITY MANAGEMENT</b>					
<b>Part I - Asset/Liability Mix</b>					
<b>Total assets = in (\$) millions</b>					
<b>Asset/Liability Categories</b>	<b>Actual volume</b>	<b>Mix as a % of assets</b>	<b>Limits per Policy</b>	<b>Target Mix</b>	<b>Variance from plan</b>
Commercial loans	\$	%	%	%	%
Agricultural loans	\$	%	%	%	%
Personal loans	\$	%	%	%	%
Residential mortgages	\$	%	%	%	%
Other loans	\$	%	%	%	%
Financial investments	\$	%	%	%	%
Other investments	\$	%	%	%	%
Capital assets	\$	%	%	%	%
Gross liquid assets	\$	%	%	%	%
Term deposits	\$	%	%	%	%
Demand deposits	\$	%	%	%	%
Foreign currency	\$	%	%	%	%
Brokered deposits	\$	%	%	%	%
Liquidity borrowings	\$	%	%	%	%
<b>Part II - Asset/Liability Growth</b>					
<b>Asset/Liability Categories</b>	<b>Volume (this year)</b>	<b>Volume (last year)</b>	<b>Growth from last year</b>	<b>Projected Growth</b>	<b>Variance from Plan</b>
Commercial loans	\$	%	%	%	%
Agricultural loans	\$	%	%	%	%
Personal loans	\$	%	%	%	%
Residential mortgages	\$	%	%	%	%
Other loans	\$	%	%	%	%
Financial investments	\$	%	%	%	%
Other investments	\$	%	%	%	%
Capital assets	\$	%	%	%	%
Gross liquid assets	\$	%	%	%	%
Term deposits	\$	%	%	%	%
Demand deposits	\$	%	%	%	%
Foreign currency	\$	%	%	%	%
Brokered deposits	\$	%	%	%	%
Liquidity borrowings	\$	%	%	%	%

<b>Schedule 7.6 (continued)</b>					
<b>SAMPLE BOARD REPORT ON ASSET/LIABILITY MANAGEMENT</b>					
<b>Part III: Operational Cash flows (If available, attach a Cash Flow Statement with this report)</b>					
	Cash in-flows	Cash out-flows	Planned In-flows	Planned out-flows	Variance from Plan
This Quarter	\$	\$	\$	\$	%
<b>Part IV: Financial Margin</b>					
Financial Margin (as a % of total assets)	Actual	Per Plan	Variance from plan	Last Year	Last Quarter
This Quarter	%	%	%	%	%
Year to Date	%	%	%	%	%
<b>Part V: Exposure to Interest Rate Risk</b>					
Per Section 78 of Regulation 76/95, what is the credit union's exposure to a 1% change in interest rates, on a shock test basis, as at the period ending date of this report? \$ _____					
<i>(Optional: If the credit union uses an alternative shock test: )</i>					
Other measures of interest rate risk exposure, based on a methodology documented in operational procedures?					
<b>Part VI: Exposure to Foreign Currency Risk</b>					
				Volume \$	As a % of total assets
How much foreign currency is held as deposits by the credit union?				\$	%
How much of this foreign currency is not hedged by loans or derivative instrument?				\$	%
<b>Part VII: Use of Derivatives</b>					
Derivative transactions currently held by the credit union	Notional \$ Value		Purpose of the derivative instrument		
		\$			
		\$			
<b>Part VIII: Corrective Action/Strategies</b>					
Variance	Corrective Action/Strategy				

## **Mix and Yields**

In order to facilitate appropriate management and board monitoring of ALM, the actual mix and yields of major categories of assets and liabilities need to be measured on a periodic basis (at least quarterly) and compared to plan and (where possible) historical performance.

It is important to monitor for variances from the business plan in the volume and mix of loans, investments and deposits, as this could have serious effects on net financial margin. Different types of loan and investment categories will provide different yields. Measurement of the portfolio mix can alert management to future declining margins caused by an unfavourable shift towards lower yielding loans. Conversely, higher than expected asset yields could reflect an undesired shift toward higher risk loans and investments. Written explanations for changes in mix and yields should be provided by management to the board for its periodic review of the financial statements.

The average costs of other sources of funding (borrowings and equity) should be monitored at least quarterly by board and management to determine if they are reasonable. Where interest/dividends are paid to members at the end of the year, these should be estimated and accrued for interim reporting.

## **Growth**

The credit union's reporting system should also measure the growth and decline of the major categories of assets and liabilities. These measurements need to be reviewed and assessed relative to plan and historical performance. Measurement and review should be conducted at least quarterly.

Loan volumes should be compared to plan and historical volumes to assess the extent and rationale for loan growth. Stagnant loan growth should be analyzed in terms of the local competitiveness of the institution's pricing and marketing, membership demographics and new product needs, as well as lending staff capabilities. Confirmed causes of low loan growth should be addressed immediately as that this situation is often the cause of declining credit union viability.

Deposit growth needs to be similarly measured and should approximate the rate of loan growth, otherwise excess liquidity will cause spreads to decline. Deposit pricing and product mix may need to be reconsidered mid year if unfavourable variances persist. In this case, management should document new deposit growth strategies for the board to consider and ratify.

## Financial Margin

Financial margin should be measured at least quarterly and compared to planned and (where possible) historical earnings. Differences in expected performance should be explained in terms of the unanticipated behaviour of factors impacting spread, and where applicable, strategies. This information should be included in the report to the board, for review and discussion at their regularly scheduled board meetings.

Financial margin measures the profitability of the credit union's balance sheet. Financial margin is net interest income after loan costs expressed as a percentage of average assets, and can be calculated as follows:

<b>Schedule 7.7 FINANCIAL MARGIN</b>	
<b>Financial Margin = <u>Net Interest and Investment Income less loan costs</u></b>	
<b>Average Assets</b>	
Where net interest and investment income is calculated as:	
+	Loans Interest Income
+	Investment Income
-	Interest expense on deposits
-	<u>Other interest expense and dividends</u>
=	Net interest and Investment Income

Monitoring financial margin is important to ensure there are sufficient earnings to cover operating expenses. Refer to schedule 7.8, which highlights non-balance sheet items affecting financial margin.

<b>Schedule 7.8 INFLUENCES ON FINANCIAL MARGIN</b>	
•	Pricing policy
•	Asset/liability mix
•	Timing of loan/deposit repricing
•	Investment yields
•	Level of excess liquidity
•	Interest rate fluctuations
•	Foreign currency fluctuations

## Interest Rate Risk Measurement

An important element of asset/liability management is the measurement of interest rate risk. This topic was introduced in Section 7207. Interest rate risk is the risk of an impact on an institution's earnings and capital due to changes in interest rates. One of the primary causes are mismatches in the terms of a credit union's deposits and loans.

Interest rate risk exposure can lead to significant operating losses, and deterioration of capital, and therefore must be periodically measured and where appropriate, managed effectively.

### Measuring Interest Rate Risk

In most credit unions, the interaction of portfolio volumes, rates, maturities and yield curves is so complex that it cannot be left to intuitive judgment to quantify interest rate risk. Therefore, techniques for accurately measuring interest rate risk are required.

The following are some techniques that can be used to measure interest rate risk:

- Gap (Matching) Schedule analysis;
- Gap Ratio analysis (30/70 Rule);
- Earnings Shock Test;
- Dynamic Gap analysis;
- Simulation analysis;
- Dollar Duration analysis.
- These techniques are each discussed in this Section.

### Gap Schedule

The most common tool used to measure interest rate risk is the gap, or matching schedule (also termed asset/liability matching report).

In a gap schedule, all of the institution's balance sheet items (both on and off) are placed into a series of "time buckets". A "time bucket" is a consecutive period of time (usually three months or one year). Balance sheet items are placed into the time bucket which corresponds to the amount of time remaining before the interest rates on that item are re-priced. Refer to Schedule 7.9 for a sample Gap Schedule and an illustration of how various balance sheet items should be classified.

In Schedule 7.9 there are two special buckets for non-interest sensitive items and variable interest items. The gap schedule should include all balance sheet items (fixed rate as well as variable rate and non-interest bearing assets and liabilities) in order to ensure that all items are accounted for.

### Term

Gap schedules do not have to have limited terms. A proper gap schedule should measure the balance sheet for the entire life of its assets and liabilities. This can best be accomplished by having a final time bucket covering any repricing/maturity after five years.

**Buckets**

A credit union may choose the size and number of time buckets that appear on its gap schedule. A common approach is to segregate time buckets into monthly time buckets for the first year, then into annual time buckets for the next four years, and one final bucket for any items repricing after five years.

Another approach is to have quarterly time segments for the first year, six month buckets thereafter for another four years, and one final bucket for any items repricing after five years.

**Time to Repricing**

Assets and liabilities should be categorized into time buckets on the basis of their "time to repricing" for an accurate measurement of gap. An instrument such as a deposit or a loan "reprices" when its interest rate changes. An example of this is when a mortgage reaches the end of its term, and the new interest rate is established for a fixed period of time, usually between six months and five years. Floating rate instruments are considered to reprice daily.

The "time to repricing" is the period of time over which a fixed interest rate will remain fixed. For some assets or liabilities, this is generally the time left until maturity. However, for other items, it may be sooner. For example, a personal loan with a one year term and repayment amortized over three years may be subject to annual repricing, posing interest rate risk to the credit union at each date that it is repriced. In the gap schedule, such an instrument should be placed into the one year time bucket.

**Compliance**

The completion of a gap schedule is required to be submitted annually to DICO in the Annual Member Institution Return (the AMIR), completion of which is a condition of deposit insurance.

Schedule 7.9 SAMPLE ASSET/LIABILITY MATCHING (GAP) REPORT (\$000's)												
	Variable Rate	Under 30 days	30-60	60-90	90-365	1-2 yr.	2-3 yr.	3-4 yr.	4-5 yr.	Over 5 years	Non-Interest Bearing	Total Assets
Cash	1000											1000
S.T. Investments			1000	1000	2000							4000
L.T. Investments										500		500
Business Loans	1000		800	200	1000							3000
Personal Loans	1500		200	800	500	1000						4000
Mortgages		1000	1500	2000	4000	4000	4500	4000	3000			24000
Accrued Int.											1500	1500
Other Assets											2000	2000
<b>Total Assets</b>	<b>3500</b>	<b>1000</b>	<b>3500</b>	<b>4000</b>	<b>7500</b>	<b>5000</b>	<b>4500</b>	<b>4000</b>	<b>3000</b>	<b>500</b>	<b>3500</b>	<b>\$40000</b>
Daily Int. Savings	1500											1500
Var. Rate Deposits	500											500
Other Deposits			2000	1500	1000							4500
RRSP's		500	1000	1000	1000	4000	2000	3000	2000			14500
GIC's		500	1000	1000	1000	4000	3000	3000				13500
Accrued Interest											1000	1000
Accounts Payable											500	500
External Borrowings	500											500
Surplus & Capital											3500	3500
<b>Total Liabilities/Equity</b>	<b>2500</b>	<b>1000</b>	<b>4000</b>	<b>3500</b>	<b>3000</b>	<b>8000</b>	<b>5000</b>	<b>6000</b>	<b>2000</b>	<b>-0-</b>	<b>5000</b>	<b>40000</b>
<b>Mismatches (gap)</b>	<b>1000</b>	<b>0</b>	<b>(500)</b>	<b>500</b>	<b>4500</b>	<b>(3000)</b>	<b>(500)</b>	<b>(2000)</b>	<b>1000</b>	<b>500</b>	<b>(1500)</b>	
% matched	71%	100%	88%	88%	40%	63%	90%	67%	67%	0%	70%	
<b>Gap Ratio</b>	<b>29%</b>	<b>0%</b>	<b>12%</b>	<b>12%</b>	<b>60%</b>	<b>37%</b>	<b>10%</b>	<b>33%</b>	<b>33%</b>	<b>100%</b>	<b>30%</b>	
<b>Policy limit</b>	<b>30%</b>	<b>30%</b>	<b>30%</b>	<b>30%</b>	<b>30%</b>	<b>30%</b>	<b>30%</b>	<b>30%</b>	<b>30%</b>	<b>30%</b>	<b>30%</b>	

The extent of interest rate mismatch or gap is calculated by subtracting, for each time bucket, the volume of liabilities (including equity) subject to repricing from the volume of assets subject to repricing. If more assets than liabilities are being repriced in a given time bucket, the gap is "asset sensitive" or "positive". Conversely, if more liabilities than assets are being priced in a given time bracket, the gap is "liability sensitive" or "negative".

$$\text{Positive gap for time bucket } X = \text{Assets}_X - (\text{Liabilities}_X + \text{Equity}_X) > 0$$

$$\text{Negative gap for time bucket } X = \text{Assets}_X - (\text{Liabilities}_X + \text{Equity}_X) < 0$$

## Gap Schedule Analysis

General conclusions about interest rate risk can be made from a preliminary view of the gap schedule. Schedule 7.9 shows a typical gap schedule, where liabilities in time buckets less than one year tend to exceed assets in those buckets (negative gap). At terms over one year, assets tend to outweigh liabilities (positive gap). In a rising interest rate environment, this situation results in declining financial margin in the first year, as the cost of deposits rises with repricing while revenue from assets stays constant.

Since the fluctuations of interest rates are unpredictable, credit unions should speculate on interest rate movements through their gap position. Instead credit unions should monitor and manage their interest rate exposure, within reasonable levels, to minimize the downside risk of adverse interest rate movements.

The optimal gap position depends on the risk preference of the credit union, the financial strength of the organization to assume such risks, and the competence of the staff to manage interest rate risk.

Techniques for dealing with mismatches, however, are briefly discussed in Section 7502. Where a credit union experiences difficulty in understanding and selecting appropriate strategies, it should obtain external assistance from its league or other qualified financial advisors.

Interest rate risk can be measured from the gap schedule, either by measuring the individual gap mismatch for each time bucket (the gap ratio), or by aggregating the gap mismatches for all time buckets to determine the gap mismatch for the entire balance sheet (the earnings impact or shock test). These two techniques are discussed below.

### Gap Ratio

The gap ratio is a simple measure of balance sheet mismatch. It is a very focused measure, as it only measures the level of mismatch for one particular time bucket.

The gap ratio is defined as the ratio of net assets (or liabilities and equity) within a particular time bucket divided by the greater of their two amounts.

For time bucket x, the gap ratio =  
Absolute value of (AssetsX - (LiabilitiesX + EquityX))  
Maximum of (AssetsX or (LiabilitiesX + EquityX))

This measure is useful for assessing and prioritizing large dollar exposures to interest rate risk. Generally, it is recommended that material dollar mismatches in time buckets not exceed 30 per cent.

The gap ratio has been calculated for each time bucket identified in Schedule 7.9. Refer to the second last line of that gap schedule for the gap ratio for each time bucket. It should be noted, however, that the gap ratio test is not as accurate as other available techniques. Its primary shortcoming is that it may miss small percentage exposures that can add up into large dollar

exposures. Also, it does not take into account that an exposure in one time bucket could offset an exposure in another.

### Measuring the Earnings Impact of Gap

A gap schedule can provide management with a dollar measurement of interest rate risk. A simple quantification of earnings risk over the coming year can be accomplished through the calculation of the earnings shock test.

By recognizing the inherent time value of money, a nominal dollar gap schedule (such as the one in Schedule 7.9) can be modified to effectively calculate the likely annual earnings impact of changing interest rates. For example, weighing the gaps in each time bucket by the length of time that they are sustained gives a better assessment of the actual interest exposure during the fiscal period. Under this methodology, a weighting factor is applied to each gap calculated for each time bucket. Weighted mismatches for all time buckets are then totaled.

<b>Schedule 7.10</b>								
<b>SAMPLE EARNINGS IMPACT TEST (SHOCK TEST)</b>								
Total assets = \$95.4 M								
\$ are in 000's	Variable Rate	Up to 3 months	3 to 6 months	6 to 9 months	9 to 12 months	over 12 months	Total	
A	<b>Assets</b>	500	1,000	3,000	6,000	5,000	79,900	95,400
B	<b>Liabilities &amp; Equity</b>	6,000	4,000	3,000	1,000	5,400	76,000	95,400
C	<b>GAP (A-B)</b>	<b>(5,500)</b>	<b>(3,000)</b>	<b>0</b>	<b>5,000</b>	<b>(400)</b>	<b>3,900</b>	
D	<b>Weight</b>	1.000	0.875	0.625	0.375	0.125	0	
	<b>Weighted Factor (CxD)</b>	<b>(5,500)</b>	<b>(2,625)</b>	<b>0</b>	<b>1,875</b>	<b>(50)</b>	<b>0</b>	<b>(6,300)</b>
Weighted Cumulative GAP							(6,300)	
1 per cent of Weighted Cumulate GAP (6,300 x 0.01)							(63)	
Exposure in terms of total assets = 63/95,400							(0.066%)	
Conversion to basis points							(6.6)	

Schedule 7.10 computes an estimated dollar gain or loss in annual earnings attributable to an immediate interest rate change of one per cent. The total change in earnings is calculated by multiplying the weighted average gap by the magnitude and sign of the assumed interest rate change (i.e. one per cent). As illustrated in Schedule 7.10, an interest rate increase of one per cent would decrease earnings for the year by \$63,000, or 6.6 basis points. Similarly, a decrease in interest rates of one per cent would increase earnings for the year by \$63,000.

## Shock Test

The methodology used to measure interest rate risk exposure in Schedule 7.10 is sufficient to meet the specifications of the shock test prescribed in section 78(2) of Regulation 76/95. (The shock test was introduced in Section 7101 of this Reference Manual).

## Measuring Interest Rate Risk Exposure over one year

The gap schedule illustrated in Schedule 7.10 measures interest rate risk exposure over a one year period only. However, most credit union's have assets and liabilities repricing or maturing over much longer time horizons. Adapting the gap schedule to determine the effects of interest rate fluctuations on current net interest income for longer periods can be achieved by changing the weights applied to each time bucket. For more information, contact your league or financial advisor.

## Limitations of Gap Analysis

The earnings measure illustrated in Schedules 7.10 provides valuable insight into the effects of interest rate fluctuations on the credit union's earnings and reported balance sheet position. However, the projected results are dependent on a number of underlying assumptions. Some of the major limitations of the two techniques include the following:

- An assumption that interest rate changes of one per cent, or multiples thereof, occur at the beginning of the year and are sustained throughout the year which may not be realistic. An assumed one per cent increase in rates which is immediate and sustained for a year, would be roughly equivalent, in terms of its effect on earnings, to a two per cent gradual increase taking place over the same interval.
- An assumption that any change in interest rates simultaneously affects all the balance sheet items subject to repricing in the same way, but this generally does not happen.
- An assumption that the existing structure of the balance sheet will remain static over the next 12 months. New business and deposit compounding in addition to unanticipated early withdrawals or prepayments will affect the gap position and thus the exposure to interest risk during the year.

## Other Techniques

More sophisticated gap measurement techniques are available that take into account additional variables of interest rate risk and realistic assumptions regarding market conditions and that analyze interest rate risk for a greater number of interest rate variations. These techniques, dynamic gap analysis, simulation, and dollar duration, can provide a more accurate measure of interest rate risk.

These techniques, which are described below, generally require a high level of financial expertise and in some instances, require sophisticated computer models. For more information on such techniques, the credit unions can contact their league or other financial advisor.

## Dynamic Gap Analysis

Estimates of early prepayments of personal loans can be accounted for in the gap schedule using the average term historically experienced on these types of open loans, rather than their contractual maturity dates. Subjective estimates for new business cash flows can also be included. A gap schedule which takes into account these types of assumptions is commonly referred to as a dynamic gap schedule.

***Simulation***

The analytical process of calculating earning outcomes for alternative interest rate scenarios is termed "simulation". The simulation technique, which is a type of income sensitivity analysis, is most efficiently and conveniently performed by computer, although it can also be performed manually.

***Dollar Duration***

Duration is a portfolio valuation technique which measures the life of an asset or liability based on the present value of its cash flows. The duration technique provides an estimate of the rise or decline in the market value of equity of a portfolio, under various interest rate scenarios.

***Conclusion***

Several techniques have been discussed in this section regarding the measurement of interest rate risk. For a credit union with a sizeable and complex balance sheet, all of the above techniques should be considered. It may also wish to contact its league or financial advisor for advice in selecting a measurement technique or to obtain technical expertise.

## Monitoring Derivatives

The use of financial derivatives to hedge interest rate risk and foreign exchange risk were discussed in Sections 7209 and 7210. It is recommended that credit unions which use financial derivative monitor the instruments on an ongoing basis. The monitoring of financial derivatives involves:

- measuring the value of each instrument on a periodic basis (at least annually);
- assessing the instruments appropriateness as a hedge against interest rate risk given the current economic environment (at least annually);
- reporting this information to the board (at least annually);
- disclose the market value of derivatives instruments annually in the notes to the financial statements.

For guidance on how to value derivative instruments, and how to record them for accounting purposes, refer to:

- FSCO's Accounting Principals for Derivatives Instruments;
- the Canadian Institute of Chartered Accountants (CICA) Handbook;
- an accountant;
- the credit union's league.

## Risk Management

### Corrective Action

An important activity in the effective management of risk is management's timely response to unauthorized risk or poor performance developments. As a follow up to the asset/liability risk measurements taken by the credit union (and discussed in Section 7400), management should investigate all significant performance variances relative to the annual business plan and to historical performance, and respond by taking action to correct these variances. Management must similarly respond to any contravention of board policy or regulatory requirements, or other unauthorized risk.

### Operational Procedures

Procedures can assist management in ensuring regulatory and policy requirements are met with respect to asset/liability mix, interest rate risk exposure, foreign exchange rate exposure, and derivatives use.

It is recommended that the credit union have procedures in place which ensure that:

- balance sheet limits for major asset/liability and capital categories have not been exceeded;
- product pricing has been conducted in accordance with policy;
- interest rate risk had been measured and monitored in accordance with policy;
- uncovered foreign currency exposure does not exceed policy limits.

Sections 7501 and 7502 discuss procedures that can assist management in complying with policy and regulatory requirements. To assist in implementation, procedures should be both appropriate and cost effective given the size of the credit union's operations.

It is a sound business and financial practice for credit unions to document procedures. Written procedures result in higher staff productivity and better control over resources.

## Reliance on Qualified and Competent Staff and Volunteers

In larger credit unions, the chief financial officer or manager of finance would be responsible for ALM, together with the management of liquidity, investments and capital. These functions combined are commonly referred to as treasury operations. In smaller organizations, the treasurer manager would coordinate these activities.

The establishment of an advisory Asset/Liability Management Committee (ALCO) to assist the person chiefly responsible for treasury operations is recommended. In smaller institutions, this committee would typically be a subcommittee of the board, including the treasurer manager. In larger organizations, the committee could be comprised of board and management representatives, or limited exclusively to senior management, where operational issues are very complex. Refer to Schedule 7.11 for Sample Terms of Reference

### Schedule 7.11

#### SAMPLE TERMS OF REFERENCE FOR ASSET/LIABILITY MANAGEMENT COMMITTEE

**Purpose:** ALCO assists the chief executive officer (CEO) and chief financial officer (CFO) manage the mix, yields and maturities of assets and liabilities and interest rate exposure to meet policies and targets as set by the board of directors.

**Composition:** ALCO has five members: CEO, CFO, credit manager, controller, and manager sales & marketing.

**Authority:** ALCO acts in an advisory capacity to the CEO and CFO and has no direct authority to make financial decisions.

**Organization:** The CFO acts as ALCO Chair, the CEO acts as ALCO Vice Chair and the Controller acts as ALCO Secretary.

**Notice of Meetings:** The CFO or CEO distributes verbal, electronic or written notice of upcoming ALCO meetings in advance of the meeting. Normally, the date and time of the next meeting is set at the conclusion of each ALCO meeting.

**Meeting Materials:** The following written materials are distributed to each ALCO member in advance of each regular meeting:

- Agenda for the meeting (to be amended, completed and adopted at the meeting).
- Minutes of the last regular ALCO meeting and minutes of other, previous ALCO meetings not yet adopted.
- Reports related to asset/liability, investment, liquidity and interest rate risk management.

**Minutes:** The ALCO Secretary prepares minutes of every meeting and presents them to the next ALCO meeting. All corrective action decided upon or ratified shall be entered into the minutes and form part of the credit union's corporate records.

**Committee Expenditures:** ALCO may recommend expenditures in areas such as marketing, but such commitments are authorized by the Manager responsible for the applicable area of operation or by the CEO if such expenditures have not been budgeted. ALCO has no direct spending authority.

## Managing Interest Rate Risk

This section summarizes some of the procedures that may be followed to reduce interest rate risk. These procedures are intended to assist credit unions which face significant asset/liability mismatching. The following interest rate risk management techniques are discussed in this section:

- Traditional portfolio manipulation techniques (e.g. incentive pricing, staggered deposit renewals, etc.).
- External hedging techniques (e.g. use of derivatives, such as interest rate swaps).

Procedures for reducing interest rate risk should be devised within the framework of existing strategies of the organization, its current risk position and the economic constraints which the credit union faces in adjusting its asset/liability mix.

### Traditional Portfolio Manipulation Procedures

Traditional portfolio manipulation procedures for the following three different mismatch scenarios are discussed below: reducing exposure to rising interest rates (closing a negative gap), reducing exposure to falling interest rates (closing a positive gap), and reducing seasonal exposures. Although effective, traditional measures of controlling interest rate risk have impacts on members, usually by changing deposit and loan rates to induce members to change their choices of borrowing and deposit terms. More transparent alternatives for reducing interest rate risk, mainly derivatives, are discussed later in this Section.

### Procedures for Reducing Exposure to Rising Rates (Closing a Negative Gap)

During a period of climbing interest rates, a credit union which is funding its long term loans with short term deposits (negative gap) will experience rising financing costs as its deposits float at increasingly high rates. In order to reduce this exposure, the following procedures may be applied to shorten the term of assets and lengthen the term of liabilities:

- Price products so that favourable rates encourage shorter maturities for loans and longer maturities for deposits. Unfavourable rates should be used to discourage loan/deposit terms that will enlarge the negative gap.
- Where pricing policy will not stem demand for longer term, fixed rate assets, restrict the availability of fixed rate loans.
- Change portfolio mix in favour of variable rate loans. Promote variable rate consumer loans over fixed rate mortgages. Consumer or commercial loans earn a higher yield and can be matched against variable rate deposits.
- Market/promote products which will close the gap position. Recommended methods of promoting products include advertisements, in-branch posters and contest prizes. Inform staff of their priority to increase certain product volumes through cross selling efforts.
- Where new business is not available to correct the gap position, encourage the conversion of maturities in the existing portfolio. Allow members to negotiate in mid-term an extended maturity for fixed rate deposits, or convert closed fixed rate loans to open loans to encourage prepayment.
- Consider selling a portion of the fixed rate mortgage portfolio to other industry players. Such an arrangement allows ongoing member contact, the correction of an unfavourable mismatch and the option to earn a return for continuing service.

- Use the investment portfolio, if necessary, to correct a negative gap by maintaining investments in short-term instruments.

### **Procedures for Reducing Exposure to Falling Rates (Closing a Positive Gap)**

The same procedures as those described above may be used to reduce exposure to falling rates (close a positive gap), except that the opposite tactics should be employed. In an environment of falling interest rates, a credit union which is funding short-term loans with long-term deposits will experience shrinking revenues and financial margin as its loan interest income falls while deposit interest expense remains fixed. In brief, the following approaches are recommended to reduce exposure to falling interest rate (close a positive gap):

- Price products to dampen demand for variable rate loans and fixed rate term deposits.
- Where pricing does not stem demand, restrict funds available for variable rate loans.
- Change portfolio mix in favour of fixed rate mortgages.
- Market and promote products which close the gap.
- Allow members to extend mortgage terms at current fixed rates.
- Create incentives for members to cash term deposits early.
- Invest excess liquidity of the investment portfolio into longer term vehicles.

### **Reducing Seasonal Mismatches**

Credit unions that are subject to large seasonal fluctuations in product cash flows (e.g. RRSP deposits, Canada Savings Bonds purchases, mortgage advances and renewals) will experience a seasonal mismatch on one side of the balance sheet or the other which they may want to adjust. These seasonal fluctuations can be dealt with by introducing staggered maturity dates on products such as RRSP's, term deposits, loans or mortgages. Where necessary, price should be used as an incentive for the promotion of odd terms. Refer to the recommendations below to reduce seasonal mismatches:

- Stagger RRSP and RRIF deposit renewals by arranging terms to mature on the member's birthday.
- Introduce payroll deduction savings plans that take in deposits periodically, thus spreading the deposits over time.
- Promote products at certain times of the year using contests.
- Offer additional options on mortgage terms, e.g. 18, 30 or 42 month maturities, so that the renewal dates for these loans can be spread throughout the year.
- Promote short-term mortgages (e.g. six month terms) prior to RRSP season so these will mature when heavy deposits are coming in.

### **Drawbacks of Traditional Portfolio Manipulation Procedures**

Sometimes traditional manipulation procedures will trigger unwanted side effects. Consider an attempt by a credit union to correct an exposure to rising rates by:

- halting longer term mortgages to their members;
- increasing the rate on longer term deposits;
- dropping the rates for shorter term mortgages;
- a mix of any of the above.

Each of these techniques for influencing members have their drawbacks. Ceasing to offer four and five year mortgages runs the risk of losing members and their business to another financial institution. Offering higher deposit rates without an equal increase in lending rates will reduce financial margin.

Also, a potential conflict of interest may exist. Although the credit union may match longer term mortgages on its gap schedule, the members may not benefit from being persuaded to invest for longer terms.

Finally, despite all the effort, sometimes attempts to influence members just does not work. Even a high premium may not be enough to convince members to invest at longer terms.

Due to the possible adverse impacts of traditional methods on members, financial institutions often employ other methods of controlling interest rate risk through the use of derivative instruments. These are discussed below.

### **Derivative Instruments**

A derivative instrument is a financial contract whose value fluctuates in relation to the performance of an underlying asset or market index (e.g. a debt or equity security, stock market index, interest rate or foreign exchange rate). (Derivatives were introduced in Section 7210.)

Derivative instruments can be used by a credit union to reduce gap mismatch, and to reduce exposure to interest rate risk and foreign exchange risk. Derivatives must be used for hedging purposes only, and must not be used for speculative or investment purposes.

The most common derivative transaction used for managing interest rate risk is the interest rate swap, which is discussed below. Other derivative instruments are described in Schedule 7.12.

### **Interest Rate Swaps**

Interest rate swaps (swaps) are legal agreements between two parties; one party agrees to pay a fixed rate of interest for a specific term in exchange for the other party paying a variable or floating rate of interest. The fixed rate payment acts as a hedge for the longer term gaps and the floating part of the swap will hedge the short or variable term. Interest rate swaps can often provide efficient, conservative, and prudent solutions to interest rate risk management problems.

It is useful to monitor rates for trends prior to transacting a swap. On the floating side, swap rates are closely tied to rates in bond markets. The swap's fixed rate is generally set by using a specific Government of Canada bond plus the swap spread. Typically, any fees or commissions are included in the swap rate.

**Schedule 7.12**  
**REVIEW OF FINANCIAL DERIVATIVES**

**Interest Rate Swap**

Allows an organization to exchange interest expense (or interest income) cash flows with another counterparty either to fix or obtain more attractive rates, without exchanging the underlying financial instruments. Swaps may be used to hedge an interest rate gap or manage interest rate risk within regulatory limits.

**Floors, Caps, Collars**

A minimum (floor) and a maximum (cap) interest rate or a range of rates (collar) are determined for a variable-rate financial instrument. May be used to hedge an interest rate gap or manage interest rate risk.

**Interest Rate/Foreign Exchange Forward Agreements**

These are agreements between two parties, frequently a financial institution and its client, setting in advance the interest rate (or exchange rate) relating to a future payment or receipt. Forwards may be used to hedge either interest risk or foreign currency risk on large institutional deposits.

**Foreign Currency Futures Contracts**

These are agreements to take delivery of, or deliver a set amount of foreign currency on a particular date at a stipulated price through a futures exchange. (These may be used to hedge foreign currency risk).

**Securities Options**

A security option is a contract between two parties which is legally binding only on the seller of the option. An option grants the purchaser of that option the right – but not the obligation – to purchase (call option) or sell (put option) a security at a specified price, commonly referred to as a strike price, up to a specified date. The seller of an option grants that right to the purchaser for the extra income received. Options can be used to hedge against volatile portfolio investment values.

**Stock Index Options**

Same as above, but the value of these options fluctuate in relation to specific stock market indices. These options can be used to hedge an entire securities portfolio.