



**REGULATORY GUIDELINE**

# **Interest Rate Risk Management**

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## I. PURPOSE

This is a Regulatory Guidance Document (Guideline) as contemplated by the Standards of Sound Business Practice (the Standards). It supplements and expands upon Section 2, Control Environment of the Standards and must be adhered to by Saskatchewan credit unions.

Interest rate risk is an important risk that can affect the safety and soundness of financial institutions, including credit unions. The Corporation believes that a control framework that manages this risk to prudent levels is a fundamental component of sound banking practice. This guideline outlines the Corporation's expectations regarding an institution's management of Interest Rate Risk (IRR).

## II. INTRODUCTION

IRR refers to the current or prospective risk to a credit union's capital and earnings arising from adverse movements in interest rates. When interest rates change, the present value and timing of future cash flows change. Such changes will affect the underlying value of a credit union's assets, liabilities and/or off-balance sheet items, and hence, its economic value. Changes in interest rates also affect a credit union's earnings by altering interest rate-sensitive income and expenses, affecting its net interest income (NII).

Excessive IRR can pose a significant threat to a credit union's current capital base and/or its future earnings if not managed appropriately.

### SCOPE OF APPLICATION

This guideline applies to all credit unions on a consolidated basis. The Corporation's application of this guideline will be commensurate with each credit union's nature, scope, complexity and risk profile. The Corporation will consider all these factors in establishing its expectations and the level of supervisory intensity at each credit union regarding IRR.

When reviewing a credit union's compliance with this guideline, the Corporation will consider the following criteria:

- the level of inherent IRR at the credit union
- the complexity of a credit union's business lines, products and services
- the size of a credit union, taking into consideration on and off-balance sheet exposures as well as income statement metrics (e.g., earnings)

To the extent possible, the Corporation will apply consistent expectations across credit unions with similar characteristics, based on the above criteria. The Corporation will assess a credit union's adherence to this guideline based on the principles set out below. The Corporation recognizes that there is a range of acceptable practices to effectively manage IRR.

## DEFINITIONS

This guideline considers three main sub-types of IRR<sup>1</sup>:

- a) **Gap risk** - arises from the term structure of banking book instruments and describes the risk arising from the timing of instruments' rate changes. The extent of gap risk depends on whether changes to the term structure of interest rates occur consistently across the yield curve (parallel risk) or differentially by period (non-parallel risk).
- b) **Basis risk** - describes the impact of relative changes in interest rates for financial instruments that have similar tenors but are priced using different interest rate indices.
- c) **Option risk** - arises from option derivative positions or from optional elements embedded in an institution's assets, liabilities and/or off-balance sheet items, where the credit union or its customer can alter the level and timing of their cash flows. Option risk can be further characterized into automatic option risk and behavioural option risk.

Each of these sub-types can change the price/value or earnings/costs of interest rate-sensitive assets, liabilities and/or off-balance sheet items in a way, or at a time, that can adversely affect a credit union's financial condition.

## ECONOMIC VALUE AND EARNINGS-BASED MEASURES

The Corporation expects credit unions to manage IRR through both earnings-based and economic value measures. While earnings-based measures focus on income volatility, economic value measures provide a suitable benchmark for comparability and capital adequacy. If a credit union were to solely minimize its economic value risk by matching the repricing of its assets with liabilities beyond the short term, it could run the risk of earnings volatility. Likewise, management decisions to optimize short-term NII fluctuations could be structurally unviable when evaluated on a longer horizon.

## OVERRIDING PRINCIPLE OF IRR

**Principle #1: IRR is an important risk for all credit unions that should be specifically identified, measured, monitored and controlled.**

IRR is a significant risk that arises from banking activities. IRR arises due to interest rate variability over time, while the business of banking typically involves intermediation activity that produces exposures to both maturity mismatch (e.g., long-maturity assets funded by short-maturity liabilities) and rate mismatch (e.g., fixed rate loans funded by variable rate deposits). In addition, there are optionalities embedded in many of the common banking products (e.g., non-maturity deposits, term deposits, fixed rate loans and mortgage commitments) that may or may not be triggered due to changes in interest rates.

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<sup>1</sup> Refer to Annex I of the Basel Committee on Banking Supervision Standard, Interest Rate Risk in the Banking Book, for a detailed explanation of interest rate risk and its measurement techniques.

The Corporation expects all credit unions to be familiar with all potentially material elements of IRR to actively identify their exposures and to take appropriate steps to measure, monitor and control IRR.

Credit unions should identify the interest rate risks inherent in their activities undertaken and ensure that these are subject to adequate procedures and controls. Significant hedging or risk management initiatives require appropriate diligence and approvals before being implemented. Products and activities that are new to a credit union should undergo a careful pre-acquisition review to ensure that the IRR characteristics and model risks are well understood and subject to a predetermined test phase before being fully rolled out. Prior to introducing a new product, hedging, or risk-taking strategy, credit unions should have in place appropriate operational procedures and risk control systems. The management of a credit union's IRR should be integrated within its broader risk management framework and aligned with its business planning and budgeting activities.

### III. GOVERNANCE

Please refer to the Corporate Governance Regulatory Guideline for additional guidance regarding the Corporation's expectations of boards of directors and senior management.

**Principle #2: Credit unions are responsible for oversight of the IRR management framework and the risk appetite for IRR. The board is responsible for understanding the nature and level of the credit union's IRR exposure. Monitoring and management of IRR should be undertaken by senior management or its delegates. Credit unions must have an adequate IRR management framework involving regular independent reviews and evaluations of the effectiveness of the system.**

#### ENTERPRISE RISK MANAGEMENT FRAMEWORK

The board is expected to understand the nature and the level of a credit union's IRR exposure and the overall policies with respect to IRR. It should ensure that there is clear guidance regarding the acceptable level of IRR, given the credit union's business strategies. Furthermore, the board is expected to know how IRR is managed, how it may affect the stability of the credit union and the impacts on its performance and operations.

The board should receive and review regular reports on the level and trend of the credit union's IRR exposures. The reporting should be sufficiently detailed to allow the board to understand and assess the performance of senior management, or its delegates, in monitoring and controlling IRR in compliance with approved policies. The Corporation expects that such reviews will be carried out more frequently when the credit union has significant IRR exposures.

Senior management should oversee the approval, implementation and review of IRR management policies, procedures and limits. Accordingly, senior management is responsible for ensuring that the credit union identifies, measures, monitors and controls IRR consistent with the approved strategies and policies. More specifically, senior management is responsible for setting:

- appropriate limits on IRR, including the definition of specific procedures and approvals necessary for exceptions, and ensuring compliance with those limits

- adequate systems for measuring IRR
- standards for measuring IRR, valuing positions and assessing performance, including procedures for updating interest rate shock and stress scenarios, and key underlying assumptions driving the credit union's IRR analysis
- a comprehensive IRR reporting and review process
- effective internal controls and management information systems

Both the board and senior management should understand the implications of the credit union's IRR strategies, including the potential linkages with, and impact on, market, liquidity, credit and operational risk. Senior management is expected to have sufficient technical knowledge to facilitate the board's understanding of IRR, to be responsible for ensuring that delegated staff has the capability and skills to measure, monitor and report IRR, and to ensure that adequate resources are devoted to IRR management. Likewise, the board should have sufficient knowledge of IRR to understand the decisions, plans and policies being implemented by senior management.

## DELEGATION

Senior management may delegate the task for developing IRR policies and practices to expert individuals, a third-party service provider<sup>2</sup> or to an Asset and Liability Management Committee (ALCO). In the case of an ALCO, meetings should occur regularly and include representatives from each major department connected to IRR. While it may delegate tasks or functions, senior management should not delegate to functional areas its overall responsibility for IRR. Similar to the board, senior management is expected to know how IRR is managed and how this risk may affect the stability of the credit union and the impacts on its performance and operations.

Senior management should clearly identify its delegates for managing IRR, and to avoid potential conflicts of interest, should strive for adequate separation of responsibilities in key elements of the risk management process. Credit unions should have IRR identification, measurement, monitoring and control functions with clearly defined responsibilities.

Delegates of senior management, who are responsible for managing IRR, should include individuals with clear lines of authority over the units responsible for establishing and managing positions. There should be a clear communication channel to convey the delegates' directives to these line units.

Senior management should ensure that the credit union's organizational structure enables its delegates to carry out their responsibilities and facilitates effective decision-making and good governance. The risk management and strategic planning areas of the credit union should also communicate regularly to facilitate evaluations of risk arising from future business.

The separation of responsibilities and level of reporting should reflect the credit union's nature, scope, complexity and risk profile.

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<sup>2</sup> Refer to the Outsourcing of Business Activities, Functions and Processes Guideline (2018-02) for further information on the Corporation's expectations for credit unions pertaining to outsourcing one or more of its business activities to a third-party service provider.

## INTERNAL CONTROLS

Credit unions should have adequate internal controls to ensure the integrity of their IRR management process and compliance with credit union policies. The internal controls should promote effective and efficient operations, reliable financial and regulatory reporting, and compliance with relevant laws and regulations.

With regard to IRR control policies and procedures, credit unions should have appropriate approval processes, exposure limits, reviews and other mechanisms designed to provide a reasonable assurance that risk management objectives are being achieved.

In addition, credit unions should have suitable routines for ongoing and independent evaluations and reviews of their internal control system and risk management processes. This includes certifying that personnel comply with established policies and procedures. Such reviews should address any recent significant changes that impact the effectiveness of controls (including changes in market conditions, personnel, technology and structures of compliance with exposure limits) and confirm that escalation procedures for any exceeded limits remain appropriate. All such evaluations and reviews should be conducted by individuals and/or units that are independent of the function they are assigned to review. When revisions or enhancements to internal controls are warranted, credit unions should have internal review mechanisms in place to promote timely implementation.

The Corporation expects credit unions to maintain an adequate degree of impartial oversight over treasury operations. The Corporation recognizes that treasury operations in some credit unions report to finance or another independent control function. In those cases, senior management should consider establishing mitigating controls to maintain impartial oversight over treasury operations.

Institutions' IRR identification, measurement, monitoring and control processes should be reviewed by an independent auditing function (such as an internal or external auditor) with sufficient and appropriate technical expertise on a regular basis.

**Principle #3: A credit union's risk appetite for IRR should be articulated in terms of the risk to both economic value and earnings. Credit unions should implement policy limits that target maintaining IRR exposures consistent with their risk appetite.**

Credit unions should have clearly defined risk appetite statements implemented through a comprehensive enterprise risk management framework, (i.e., policies and procedures for limiting and controlling IRR). The enterprise risk management framework should delineate delegated powers, lines of responsibility and accountability over IRR management decisions and should clearly define authorized instruments, hedging strategies and risk-taking opportunities. All IRR policies should be reviewed periodically and revised as needed.

## POLICY LIMITS

Policy limits should be appropriate to the nature, scope, complexity and capital adequacy of the credit union, as well as its ability to measure and manage its risks.

Policy limits should be consistent with the credit union's overall approach for measuring IRR. Aggregate risk limits, clearly articulating the appropriate amount of IRR, should be applied on a consolidated basis. Limits may be associated with specific scenarios of changes in interest rates and/or term structures. The interest rate movements used in developing these limits should represent meaningful shock and stress situations, taking into account historical interest rate volatility. Procedures should be established to identify, measure, monitor and control applicable risks.

Limits could be absolute in the sense that they should never be exceeded, or they may be set so that, under specific circumstances, breaches of limits can be tolerated for a predetermined short period of time. Systems should be in place to promptly escalate any positions that exceed, or are likely to exceed, hard limits. There should be a clear policy on who will be informed, how the communication will take place and the actions to be taken in response to an exception. This includes communication to the board and other pertinent stakeholders.

#### **IV. MEASUREMENT, ASSUMPTIONS, SYSTEMS INTEGRITY AND MODEL GOVERNANCE**

**Principle #4: Measurement of IRR should be based on outcomes of both economic value and earnings-based measures, arising from a wide and appropriate range of interest rate shock and stress scenarios.**

##### **ECONOMIC VALUE AND EARNINGS-BASED MEASURES**

Credit unions internal measurement systems (IMS) should capture all material sources of IRR and assess the effect of market changes on the scope of their activities. In addition to the impact of an interest rate shock on its economic value, an institution's policy approach should consider its ability to generate stable earnings sufficient to maintain its normal business operations.

For risk management purposes, credit unions should pay attention to the complementary nature of economic value and earnings-based measures in their risk and internal capital assessments, particularly in terms of:

- **Outcomes** - economic value measures compute a change in the net present value of the institution's assets, liabilities and off-balance sheet items, while earnings-based measures focus on changes to future profitability within a given time horizon eventually affecting future levels of an institution's own equity capital.
- **Assessment horizons** - economic value measures reflect changes in value over the remaining life of the credit union's assets, liabilities and off-balance sheet items (i.e., until all positions have run off), while earnings-based measures cover only the short to medium term, and therefore, do not fully capture those risks that will continue to impact profit and loss accounts beyond the period of estimation.
- **Future business/production** - economic value measures consider the net present value of repricing cash flows of instruments on the credit union's balance sheet or accounted for as an off-balance sheet item (i.e., a run-off view). Depending on a credit union's nature, scope, complexity and risk profile, earnings measures may, in addition to

a run-off view, assume rollover of maturing items (i.e., a constant balance sheet view) and/or assess the scenario-consistent impact on the credit union's future earnings inclusive of future business (i.e., a dynamic view).<sup>3</sup>

## **INTEREST RATE SHOCK AND STRESS SCENARIOS**

Credit unions are expected to calculate the impact on economic value and earnings of multiple scenarios, based on:

1. internally selected interest rate shock scenarios addressing the institution's risk profile, according to its Internal Capital Adequacy Assessment Process (ICAAP)<sup>4</sup>
2. historical, hypothetical and forward-looking interest rate stress scenarios<sup>5</sup>, which tend to be more severe than shock scenarios
3. parallel shock of 100bps up or down, across all time buckets<sup>6</sup>

## **DEVELOPING INTERNAL INTEREST RATE SHOCK AND STRESS SCENARIOS**

A credit union's stress testing framework for IRR should be commensurate with its nature, scope, complexity and overall risk profile. The framework should include clearly defined objectives, scenarios tailored to the credit union's businesses and risks, well documented assumptions and sound methodologies. The framework will be used to assess the potential impact of the scenarios on the credit union's financial condition, enable ongoing and effective review processes for stress tests and recommend actions based on the stress test results. IRR stress tests should play an important role in the communication of risks, both within the credit union and externally with supervisors, the membership and other stakeholders through appropriate disclosures.

## **ROLES AND OBJECTIVES**

Credit unions should measure their vulnerability to loss in value and/or reductions in short-term earnings under stressful market conditions – including the breakdown of key assumptions – and consider those results when establishing and reviewing their policies and limits for IRR.

The credit union's stress testing framework for IRR should be part of its broader risk management and governance processes. This should feed into the decision-making process at the appropriate management level, including strategic decisions (e.g., business and capital planning decisions; strategies to ensure a stable and adequate net interest margin in support of required profitability; etc.). In particular, IRR stress testing and sensitivity analysis should be considered in the ICAAP, requiring credit unions to undertake forward-looking stress testing that could adversely impact the credit union's capital or earnings.

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<sup>3</sup> A dynamic view can be useful for business planning and budgeting purposes. However, dynamic approaches are dependent on key variables and assumptions that are extremely difficult to project with accuracy over an extended period and can potentially hide certain key underlying risk exposures.

<sup>4</sup> Refer to the Corporation's Internal Capital Adequacy Assessment Process (ICAAP) Guideline.

<sup>5</sup> Refer to the Corporation's Stress Testing Guideline.

<sup>6</sup> There are 19 time buckets in OSFI's standardized framework, but the analysis may be generalized to any number of buckets. Refer to Annex 1 in OSFI's Interest Rate Risk Management Guideline.



## SELECTION PROCESS FOR SHOCK AND STRESS SCENARIOS

The identification of relevant shock and stress scenarios for IRR, the application of sound modelling approaches and the appropriate use of the stress testing results require collaboration. A stress-testing program for IRR should consider the opinions of various individuals and subject matter experts, both internal and external to the credit union. This includes individuals from finance, treasury, risk management, as well as third-party service providers who support the credit union in monitoring and measuring IRR.

Credit unions should determine a range of potential interest rate movements against which they will measure their IRR exposures. Senior management should ensure that risk is measured under a reasonable range of potential interest rate scenarios, including some containing severe stress elements. A credit union should consider the nature and sources of its IRR exposures, the time required to reduce or unwind unfavourable exposures and its capability/willingness to withstand accounting losses in order to reposition its risk profile. A credit union should select scenarios that provide meaningful estimates of risk and include a range of shocks that is sufficiently wide to allow the board and senior management to understand the risk inherent in the institution's products and activities.

In developing the scenarios<sup>7</sup>, credit unions should consider a variety of factors, such as the shape and level of the current term structure of interest rates and the historical and implied volatility of interest rates. In low interest rate environments, credit unions should also consider negative interest rate scenarios and the possibility of asymmetrical effects of negative interest rates on their different asset and liability profiles.

Credit unions should evaluate various scenarios regarding how low or negative interest rates impact behaviour, products and hedging.

**Principle #5: In measuring IRR, credit unions should fully understand key behavioural and modelling assumptions. The assumptions should be conceptually sound and documented and should be tested and aligned with the credit union's business strategies.**

Both economic value and earnings-based measures of IRR are significantly affected by a number of assumptions made for the purposes of risk quantification, namely:

- expectations for the exercise of interest rate options (explicit and embedded) by both the credit union and its customers under specific interest rate shock and stress scenarios
- treatment of balances and interest flows arising from non-maturity deposits (NMDs)
- treatment of own equity in economic value measures
- the implications of accounting practices for IRR

Therefore, when assessing its IRR exposures, a credit union should make judgements and assumptions about how an instrument's actual maturity or repricing behaviour may vary from the instrument's contractual terms because of behavioural optionalities as rates change (i.e., the embedded optionality effect).

The degree of sophistication of IRR measurement techniques should be commensurate with the degree of risk inherent in the credit union.

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<sup>7</sup> See the Corporation's Guideline on Stress Testing (2011-01) for more information.

## COMMON PRODUCTS WITH BEHAVIOURAL OPTIONALITIES

Common products with behavioural optionalities include:

- Fixed rate loans subject to prepayment risk – Credit unions should understand the nature of prepayment risk for their portfolios and make reasonable and prudent estimates of the expected prepayments. The assumptions underlying the estimates and where prepayment penalties or other contractual features materially affect the embedded optionality effect should be documented. There are several factors that are important determinants of the institution's estimate of the effect of each interest rate shock and stress scenario on the average prepayment speed. Specifically, a credit union should assess the expected average prepayment speed under each scenario.
- Fixed rate loan commitments – Credit unions may sell options to retail customers (e.g., prospective mortgage buyers or renewers), whereby for a limited period, the customers can choose to draw down a loan at a committed rate. Unlike loan commitments to corporates, where drawdowns strongly reflect characteristics of automatic interest rate options, mortgage commitments (i.e., pipelines) to retail customers are also impacted by other behavioural drivers.
- Term deposits subject to early redemption risk – Credit unions may attract deposits with a contractual maturity term or with step-up clauses that enable the depositor at different time periods to modify the speed of redemption. A classification scheme should be documented describing whether a term deposit is deemed to be subject to redemption penalties or to other contractual features that preserve, or extend, the cash flow profile of the instrument<sup>8</sup>.
- Non-Maturing Deposits (NMDs) – Behavioural assumptions for deposits that have no specific repricing date are a material determinant of IRR exposures under the economic value and earnings-based measures. Credit unions should document, monitor and regularly update key assumptions for NMD balances and behaviour used in measuring IRR. To determine the appropriate assumptions for its NMDs, a credit union should analyze its depositor base in order to identify the proportion of core deposits (i.e., NMDs that are unlikely to reprice even under significant changes in the interest rate environment). Assumptions should vary according to depositor characteristics (e.g., retail/wholesale) and account characteristics (e.g., transactional/non-transactional).

Modelling assumptions<sup>9</sup> should be conceptually sound, reasonable and consistent with historical experience. They should also take into consideration the nature, scope, complexity and risk profile of a credit union. Credit unions should carefully consider how the exercise of the behavioural optionality will vary not only under the interest rate shock and stress scenario but also across other dimensions. The following table presents considerations.

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<sup>8</sup> If deemed not material, 'hardship' or 'estate' redemptions on non-cashable term deposits should not be considered as early redemption risk. As such, modeling of this risk would not be expected.

<sup>9</sup> Institutions should subject all material behavioural assumptions to modeling. Institutions should also conduct due diligence and periodic reviews to determine and confirm materiality.

<b>Product</b>	<b>Dimensions influencing the exercise of the embedded behavioural options</b>
Fixed rate loans subject to prepayment risk	<p>Loan size, loan-to-value (LTV) ratio, borrower characteristics, contractual interest rates, seasoning, geographical location, original and remaining maturity, and other historical factors.</p> <p>Other macroeconomic variables such as stock indices, unemployment rates, GDP, inflation and housing price indices should be considered in modelling prepayment behaviour.</p>
Fixed rate loan commitments	Borrower characteristics, geographical location (including competitive environment), customer relationship with the credit union, as evidenced by cross-products, remaining maturity of the commitment, seasoning and remaining term of the mortgage.
Term deposits subject to early redemption risk	<p>Deposit size, depositor characteristics, funding channel (e.g., direct or brokered deposit), contractual interest rates, seasonal factors, geographical location and competitive environment, remaining maturity and other historical factors.</p> <p>Other macroeconomic variables such as stock indices, unemployment rates, GDP, inflation and housing price indices should be considered in modelling deposit redemption behaviour.</p>
NMDs	Responsiveness of product rates to changes in market interest rates, current level of interest rates, spread between an institution's offer rate and market rate, competition from other firms, the institution's geographical location and demographic, and other relevant characteristics of its customer base.

Further, credit unions should consider the materiality of the impact of behavioural optionalities within floating rate loans. For instance, the behaviour of prepayments arising from embedded caps and floors could impact the credit union’s Economic Value of Equity.

Credit unions should be able to test the appropriateness of key behavioural assumptions, and all changes to the assumptions of key parameters should be documented. Credit unions should periodically perform sensitivity analyses for key assumptions to monitor the impact on measured IRR. Sensitivity analyses should be performed with reference to both economic value and earnings-based measures and should be reflective of the nature, scope, complexity and risk profile of a credit union.

The most significant assumptions underlying the system should be documented and clearly understood by senior management. Documentation should also include descriptions on how those assumptions could potentially affect the credit union’s hedging strategies.

As market conditions, competitive environments and strategies change over time, the credit union should review significant measurement assumptions at regular intervals and more frequently during rapidly changing market conditions. For example, if the competitive market has changed such that consumers now have lower transaction costs available to them for refinancing their residential mortgages, prepayments may become more sensitive to smaller reductions in interest rates.

**Principle #6: Measurement systems and models used for IRR should be based on accurate data and subject to appropriate documentation, testing and controls to give assurance on the accuracy of calculations. Models used to measure IRR should be appropriate for the nature, scope and complexity of the credit union.**

## **MEASUREMENT SYSTEMS AND DATA INTEGRITY**

Accurate and timely measurement of IRR is necessary for effective risk management and control. A credit union's risk measurement system should be able to identify and quantify the major sources of IRR exposure. The mix of a credit union's business lines and the risk characteristics of its activities should guide management's selection of the most appropriate form of measurement system, taking into consideration the nature, scope, and complexity of the credit union.

Credit unions should not rely on a single measure of risk, given that risk management systems tend to vary in how they capture the components of IRR. Instead, credit unions should use a variety of methodologies to quantify their IRR exposures under both the economic value and earnings-based measures, ranging from simple calculations based on static simulations using current holdings to more sophisticated dynamic modelling techniques that reflect potential future business activities.

A credit union's management information system should allow it to retrieve accurate IRR information in a timely manner. The management information system should capture interest rate risk data on all the credit union's material IRR exposures. There should be sufficient documentation of the major data sources used in the institution's risk measurement process.

In instances where credit unions utilize their own internal measurement system, data inputs should be automated as much as possible to reduce operational errors. Data mapping should be periodically reviewed and tested against an approved model version. A credit union should monitor the type of data extracts and set appropriate controls.

Where cash flows are slotted into different time buckets (e.g., for gap analyses) or assigned to different vertex points to reflect the different tenors of the interest rate curve, the slotting criteria should be stable over time to allow for a meaningful comparison of risk figures over different periods.

A credit union's internal measurement system should be able to compute economic value and earnings-based measures of IRR, as well as other measures of IRR prescribed by the Corporation based on the interest rate shock and stress scenarios defined. It should also be sufficiently flexible to incorporate supervisory-imposed constraints on institutions' internal risk parameter estimates.

## **MODEL GOVERNANCE PROCESS**

The validation of IRR measurement methods and assessment of corresponding model risk should be included in a formal policy process that should be reviewed and approved by senior management. The policy should specify the management roles and designate who is responsible for the development, implementation and use of models. In addition, the model oversight responsibilities, as well as policies including the development of initial and ongoing validation procedures, evaluation of results, approval, version control, exception, escalation,

modification and decommission processes, need to be specified and integrated within the governance processes for model risk management.

An effective validation framework should include three core elements:

- evaluation of conceptual/methodological soundness, including developmental evidence
- ongoing model monitoring, including process verification and benchmarking
- outcomes analysis, including back testing of key internal parameters (e.g., stability of deposits, prepayments, early redemptions, pricing of instruments)

In addressing the expected initial and ongoing validation activities, the policy should establish a hierarchical process for determining model risk soundness based on both quantitative and qualitative dimensions such as size, impact, past performance and familiarity with the modelling technique employed.

Model risk management for IRR measures should follow a holistic approach that begins with motivation, development and implementation by model owners and users. Prior to receiving authorization for usage, the process for determining model inputs, assumptions, modelling methodologies and outputs should be reviewed and validated independently of the development of IRR models. The review and validation results, and any recommendations on model usage, should be presented to and approved by senior management. Upon approval, the model should be subject to ongoing review, process verification and validation at a frequency that is consistent with the level of model risk appetite determined and approved by the credit union.

The ongoing validation process should, where appropriate, establish a set of exception trigger events that obligate the model reviewers to promptly notify senior management or its delegates, in order to determine corrective actions and/or restrictions on model usage. Clear version control authorizations should be designated, where appropriate, to model owners. Over time, an approved model may be modified or decommissioned. Credit unions should articulate policies for model transition, including change and version control authorizations and documentation.

IRR models can include those developed by third-party vendors. Model inputs or assumptions may also be sourced from related modelling processes or sub-models (both in-house and vendor-sourced) and should be included in the validation process. Credit unions should document and explain model specification choices as part of the validation process.

Credit unions that purchase IRR models should ensure there is adequate documentation of their use of those models, including any specific customisation. If vendors provide input for market data, behavioural assumptions or model settings, the credit union should have a process in place to determine if those inputs are reasonable for its business and the risk characteristics of its activities.

Internal audit should regularly review the risk management system and the model risk management process as part of its risk assessment and audit plan. The audit activity should not duplicate model risk management processes but should review its integrity and effectiveness. The review should be conducted by competent individuals with sufficient technical knowledge and experience.

**Principle #7: Measurement outcomes of IRR and hedging strategies must be reported to the board and senior management or its delegates on a regular basis.**

The reporting of risk measures to the board, senior management or its delegates should occur on a regular basis. These reports should compare current IRR exposures with policy limits, as well as past IRR forecasts or risk estimates with actual results (i.e., earnings) to inform potential modelling shortcomings. Reporting should also include the results of the periodic model reviews and audits on a similar frequency. Portfolios that may be subject to significant mark-to-market movements should be clearly identified and subject to oversight in line with any other portfolios exposed to market risk.

The types of reports prepared for the board and senior management will vary based on the credit union's portfolio composition but at minimum should include:

- summaries of the credit union's aggregate IRR exposures and explanatory text that highlights the assets, liabilities, cash flows and strategies (including hedging program activities) that drive the level and direction of IRR
- reports demonstrating the credit union's compliance with policies and limits
- key modelling assumptions such as NMD characteristics, prepayments on fixed rate loans, etc.
- results of stress tests, including assessment of sensitivity to key assumptions and parameters
- summaries of the reviews of IRR policies, procedures and adequacy of the measurement systems, including any findings of internal and external auditors and/or other equivalent external parties (e.g., consultants)

The IRR reports should provide aggregate information, as well as sufficient supporting detail, to enable the board and senior management to assess the sensitivity of the credit union to changes in market conditions with particular reference to portfolios that may potentially be subject to significant mark-to-market movements. The reports should guide senior management's review of the credit union's IRR management policies and procedures to ensure that they remain appropriate and sound. Senior management should also ensure that analysis and risk management activities related to IRR are conducted by competent individuals with technical knowledge and experience, consistent with the nature and scope of the institution's activities.

## V. PUBLIC DISCLOSURE

Please refer to the Financial Reporting and Disclosure Guideline (2018-01) for additional guidance.

**Principle #8: Information on the level of IRR exposure and practices for measuring and controlling IRR should be disclosed to the public on a regular basis.**

The level of IRR exposure should be regularly measured and disclosed on an annual basis. Disclosure of IRR information should be commensurate with the nature, scope, complexity and risk profile of the credit union. Credit unions should publicly disclose, at a minimum:

- their risk management objectives and policies, including the nature of IRR and key assumptions
- the results of the prescribed stress tests set out in Principle 4

## VI. CAPITAL ADEQUACY

**Principle #9: Capital adequacy for IRR should be specifically considered as part of the Internal Capital Adequacy Assessment Process in line with the credit union's risk appetite for IRR.**

Credit unions are responsible for evaluating the level of capital that they should hold and for ensuring that this is sufficient to cover IRR and its related risks. The overall level of capital should be commensurate with both the credit union's actual measured level of risk (including for IRR) and its risk appetite.

Credit unions should not only rely on supervisory assessments of capital adequacy for IRR but should also develop their own methodologies for capital allocation, based on their risk appetite. In determining the appropriate level of capital, credit unions should consider both the amount and the quality of capital needed.

Capital adequacy for IRR should be considered in relation to the risks to economic value, given that such risks are embedded in the credit union's assets, liabilities and off-balance sheet items. Given the possibility that future earnings may be lower than expected, credit unions should consider capital buffers to address any risks to future earnings.

Capital adequacy assessments for IRR should factor in:

- the size and tenor of internal limits on IRR exposures and whether these limits are reached at the point of capital calculation
- the effectiveness and expected cost of hedging open positions that are intended to take advantage of internal expectations of the future level of interest rates
- the sensitivity of the internal measures of IRR to key modelling assumptions
- the impact of shock and stress scenarios on positions priced off different interest rate indices (basis risk)
- the impact on economic value and NII of mismatched positions
- the impact of embedded losses
- the drivers of the underlying risk
- the circumstances under which the risk might crystallize

The outcomes of the capital adequacy for IRR should be considered in a credit union's ICAAP.

## VII. ASSESSMENT

**Principle #10: The Corporation will regularly assess credit unions IRR and the effectiveness of the approaches that credit unions use to identify, measure, monitor and control IRR.**

At least quarterly, credit unions are expected to report the results from the impact on economic value and earnings using the standardized scenario (Principle 4, third bullet point) to the Corporation.

Taking into account a credit union's nature, scope, complexity and risk profile at the time of assessment, the Corporation will:

- collect sufficient information from credit unions to assess their IRR exposure<sup>10</sup>
- regularly evaluate the adequacy, integrity and effectiveness of an institution's IRR management framework and assess whether its practices comply with the stated objectives and risk tolerances set by the credit union, and the expectations as set out in Principles 1 to 7
- evaluate whether a credit union's process for measuring IRR provides a sufficient basis for identifying and measuring this risk, taking note particularly of the key assumptions that affect the measurement of IRR

The Corporation will assess the adequacy of a credit union's capital relative to its IRR exposures (against expectations set out in Principle 9) to determine whether the credit union requires a more detailed examination and should potentially be subject to additional capital requirements and/or other mitigation actions.

The Corporation's evaluation could be undertaken both on a standalone basis and by making comparisons with credit unions of a similar nature, scope and complexity. In particular, the Corporation may compare the key behavioural and strategic assumptions being made by the credit union to determine whether they can be justified with regard to the economic environment and business model. The Corporation will ensure that both the information and the review process is comparable and consistent across credit unions.

Credit unions identified as outliers are considered as potentially having undue IRR. When a review of a credit union's IRR exposure reveals inadequate management or excessive risk relative to capital, earnings or general risk profile, the Corporation will require mitigation actions. This may include additional ad hoc scenarios or an additional outlier/materiality test that compares a credit union's maximum Economic Value of Equity under different prescribed interest rate shock scenarios, or IRR exposure relative to earnings.<sup>11</sup>

When the Corporation concludes that a credit union's management of IRR is inadequate, the Corporation will require the credit union to take one or more of the following actions:

- reduce its IRR exposures (e.g., by hedging)
- set constraints on its internal risk parameters
- improve its risk management framework

The reduction in IRR should be achieved within an established, specified time frame, taking into consideration prevailing financial and economic conditions, as well as the causes of the IRR exposure exceeding the supervisory threshold and its structural nature.

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<sup>10</sup> A limited and not necessarily exhaustive example of information that the Corporation may collect is reflected under the BCBS Principle #10. For example, the Corporation may collect information on the modelling of NMDs; the impact of assumptions used regarding product with optionalities; economic value and earnings-based measures for interest rate shock and stress scenarios in addition to those prescribed in Principle 4; etc.

<sup>11</sup> The Corporation will prescribe the type of outlier/materiality test based on an institution's underlying IRR exposure and the risks these exposures may pose to future capital levels or earnings. Refer to Principle 11 of OSFI's Interest Rate Risk Guideline for additional information on the outlier/materiality test.