

Market Risk

Quantitative Impact Study

Information Session #2

October 3, 2024



“

x^wməθk^wəy'əm (Musqueam Nation)
Skwxwú7mesh Úxwumixw
(Squamish Nation) səłlwətaʔɬ
(Tsleil-Waututh Nation)

”

Speakers

**DERRICK
LAU**

Vice
President,
Supervision &
Deposit
Insurance

**REBECCA
LOWREY**

Director,
Reporting &
Standards

**ABHISEK
DAS**

Senior Analyst,
Risk Surveillance &
Analytics

Agenda

1. Introduction – Summary of Sept 18 info session
2. Quantitative Impact Study (“QIS”)
 - Methodology for QIS
 - Reporting for QIS
3. QIS Timeline
4. Question and Answer

Introduction

- Market Risk in the Banking Book – Information Session on Sept 18th
- Outline Quantitative Impact Study (“QIS”) Exercise and QIS template



Quantitative Impact Study

The QIS is a data collection, scenario analysis, and proposed methodology dry run exercise that will allow us to:

- Quantify capital impact vis-a-vis existing methodologies;
- Calibrate methodology parameters; and
- Incorporate any necessary modifications based on the QIS results

→ BCFSA Interest Rate Risk in Banking Book regulations



Walkthrough of Methodology and Reporting

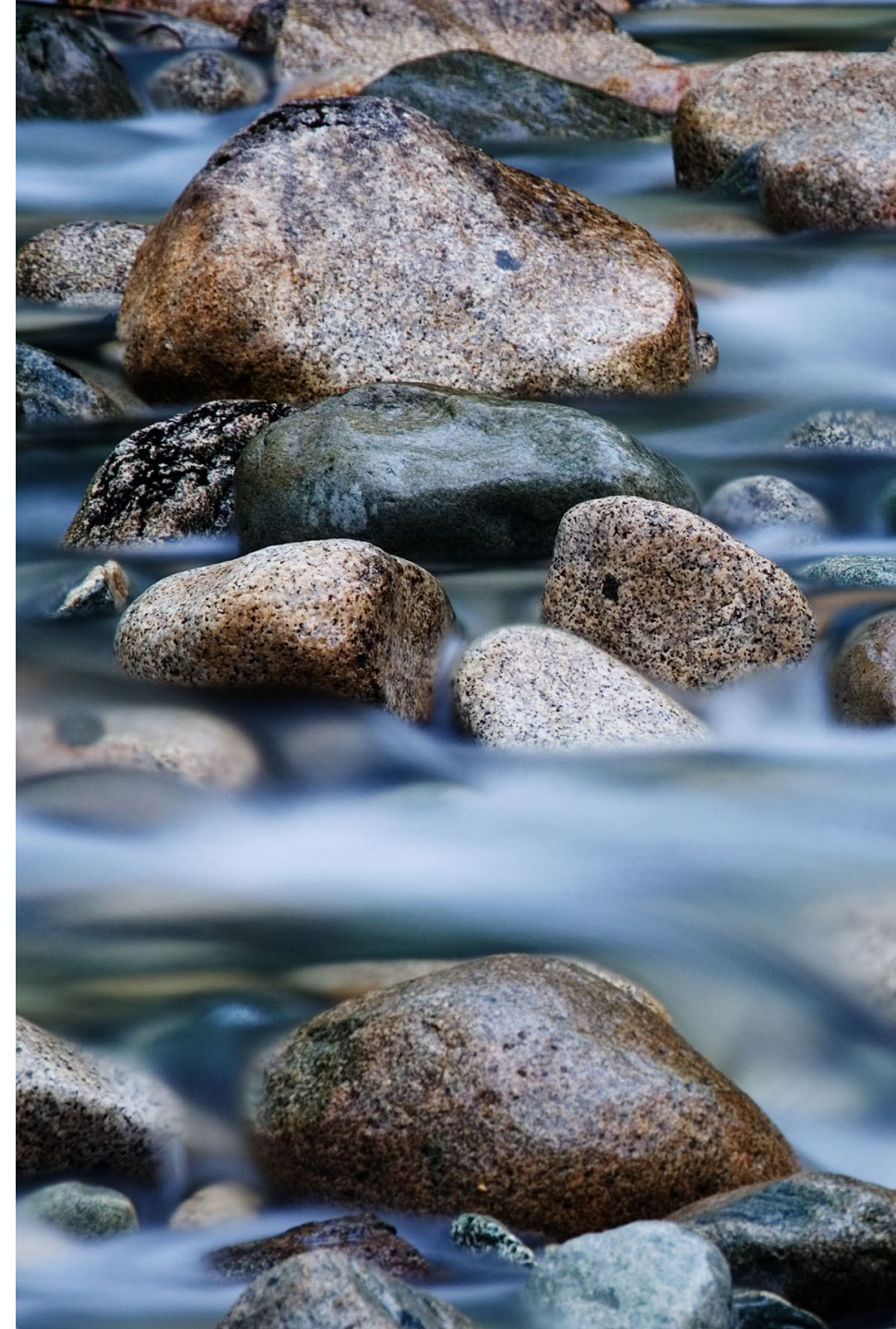
Refer to Excel File:

QIS_IRRBB_CUNAME_REPORTING DATE.xlsx

QIS Reporting Materials

The BCFSA IRRBB QIS Package includes 3 key documents:

- Introduction to BCFSA Interest Rate Risk in Banking Book Methodology
 - Outlines BCFSA's IRRBB instructions and lays out the full set of BCFSA's proposed IRRBB calculation methodology
- BCFSA Interest Rate Risk in Banking Book Quantitative Impact Study (QIS)
 - A procedural document with detailed instructions on completing the QIS Excel template
- QIS_IRRBB_CUNAME_REPORTING DATE.xlsx
 - The Excel file is the QIS reporting template to be populated according to the instructions and the methodology paper.



QIS Reporting

All Credit Unions & C1

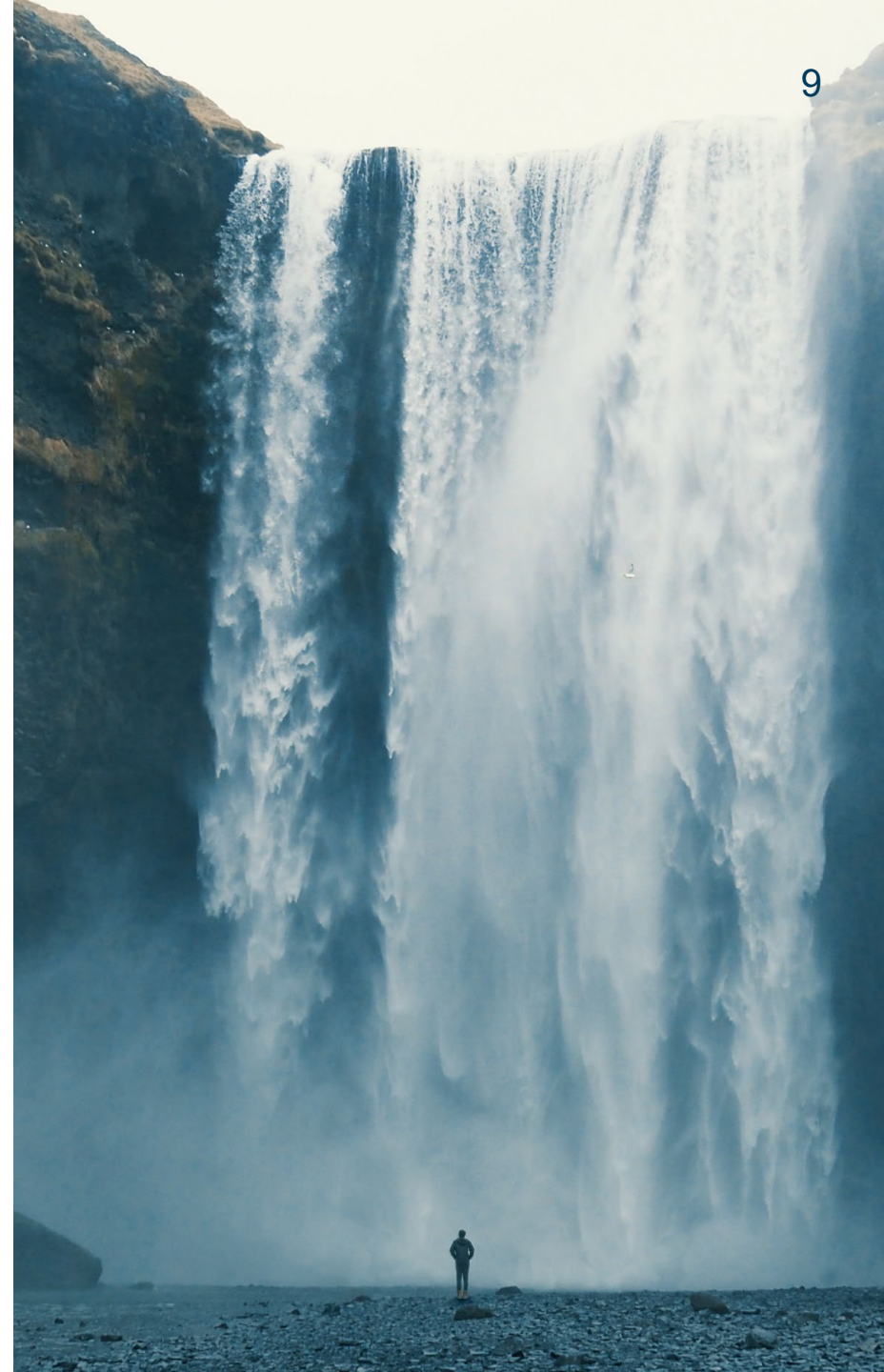
Key metrics:

Economic Value of Equity (“EVE”): measures the theoretical change in the net present value of the balance sheet excluding equity due to yield-curve perturbations

Net Interest Income (“NII”): the difference between total interest income and total interest expense, taking into account hedging activity (e.g. derivatives)

Reporting Δ EVE and Δ NII metrics under:

1. Proposed approach; and
2. Existing methodology used by all credit unions at present.



TAB: Balance Sheet Structure

This tab is to record the balance sheet of the credit union on the reporting date based on the following classification:

- Vertically classify all positions, based on their interest rate exposures, into:
 - Fixed Interest Rate;
 - Floating Interest Rate; and
 - Inflation-Linked Positions
- Horizontally classify all positions into subsets-Assets and Liabilities
- Each cell records the value in CAD of the position

This tab records:

- interest rate sensitive balance sheet positions and
- CAD denominated values

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y					
1		Balance Sheet Structure as of "Reporting Date"																												
2		Floating IR (also included all NMDs classified as non-core)								Fixed IR (also included a) CU's administrated Deposits with remuneration linked to any Interest Rate Index/basket/fund but with fully hedged exposure, b) all core NMDs)						Inflation linked														
3		Notional amount (1)	Of which: Subject to Behavioural Modelling [% over (1)]	Of which: With embedded/explicit automatic optionality [% over (1)]		Economic value (at Baseline IR) (excluding the effect of automatic IR optionality)	Weighted Average yield (%)	Weighted Average Duration [years] (excluding the effect of automatic IR optionality)	Notional amount (2)	Of which: Subject to Behavioural Modelling -% over (2)-	Of which: With embedded/explicit automatic optionality -% over (2)-		Economic value (at Baseline TSIR)	Weighted Average yield (%)	Weighted Average Duration (years) (excluding the effect of automatic IR optionality)	Notional Amount (3)	IEO1													
4				Bought	Sold						Bought	Sold																		
5																														
6	ASSETS (irrespective of its accounting treatment)	0				0			0				0			0	0													
7	Central bank																													
8	of which: Minimum reserves requirements (excluding MLP)																													
9	Interbank exposures																													
10	Retail Mortgages																													
11	Commercial Mortgages																													
12	Other loans and advances																													
13	Debt securities																													
14	Linear Derivatives (including Swaps, Forward Starting Swaps)																													
15	Non Linear Derivatives (including Options, Swaptions)																													
16	Other																													
17	LIABILITIES (irrespective of its accounting treatment)	0				0			0				0			0	0													
18	Central bank																													
19	Interbank exposures																													
20	Debt securities issued																													
21	NMDs: Retail Transactional																													
22	NMDs: Retail Non-Transactional																													
23	NMDs: Wholesale non-transactional																													
24	NMDs: Wholesale transactional																													
25	Term Deposits-Redeemable																													
26	Term Deposits-Non-redeemable																													
27	Term Deposits-Registered Plans																													
28	Term Deposits-Other																													
29	Linear Derivatives (including Swaps, Forward Starting Swaps)																													
30	Non Linear Derivatives (including Options, Swaptions)																													
31	Other																													
32																														
33																														
34																														
35																														

TAB: IRRBB Results – Existing

This tab is to record the EVE and NII metrics that are calculated based on **existing** methodology and assumptions used by the credit union

- If either EVE or NII is not being calculated in existing **PROCESS**, please leave blank
- Determine existing metric(s) (EVE/NII) for each scenario mentioned in this tab

This tab records EVE and NII metrics based on the existing methodology.

C) IRRBB Results_Breakdown_Basel

Only Reporting currency. Please use existing methodology to calculate EVE and NII.

Panel C.1. Balance Sheet Structure as of "Reporting Date"

	Floating IR (also included all NMDs classified as non-core)														Fixed IR (also included a) CU's administrated Dep															
	EVE Metric										NII Metric				EVE Metric															
	Parallel									Non-Parallel				Parallel				Parallel												
	-300 bps	-200 bps	-100 bps	-50 bps	Baseline	+50 bps	+100 bps	+200 bps	+300 bps	Short Rates Shock Down	Short Rates Shock Up	Steepener	Flattener	-300 bps	-200 bps	-100 bps	-50 bps	Baseline	+50 bps	+100 bps	+200 bps	+300 bps	-300 bps	-200 bps	-100 bps	-50 bps	Baseline	+50 bps	+100 bps	+200 bps
ASSETS (irrespective of its accounting treatment)	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
Central bank																														
Interbank exposures																														
Retail Mortgages																														
Commercial Mortgages																														
Other loans and advances																														
Debt securities																														
Linear Derivatives (including Swaps, Forward Starting																														
Non Linear Derivatives (including Options, Swaptions)																														
Other																														
LIABILITIES (irrespective of its accounting treatment)	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0
Central bank																														
Interbank exposures																														
Debt securities issued																														
NMDs: Retail Transactional																														
NMDs: Retail Non-Transactional																														
NMDs: Wholesale non-transactional																														
NMDs: Wholesale transactional																														
Term Deposits-Redeemable																														
Term Deposits-Non-redeemable																														
Term Deposits-Registered Plans																														
Term Deposits-Other																														
Linear Derivatives (including Swaps, Forward Starting																														
Non Linear Derivatives (including Options, Swaptions)																														
Other																														

Interest Rate Shock Scenario Interest Rate Shock in bps

Short 300

Long 150

TAB: IRRBB Results – Basel

This tab is to record results as per BCFSA methodology with Basel parameters for shaping scalar and time buckets:

- Classify each balance sheet position as:
 - Fixed interest rate position; or
 - Floating interest rate position
- Classify into asset or liability classes
- Discount curve perturbation based on scenarios (*Row 7*).
- EVE and NII metrics for each:
 - Scenario; and
 - Asset and liability position

This tab records EVE and¹⁴
NII metrics based on:
BCFSA IRRBB
methodology
Basel time buckets and
shaping scalar

Examples of rate shocks:

- Short Rate Shock Down of 275 bps (with a floor of 100 bps) (EVE)
- Shock Up of 50 bps parallel discount curve perturbation (NII)

C) IRRBB Results_Breakdown Basel

Only Reporting currency. Basel Parameters for shaping scalar and time buckets. EVE and NII to be calculated using BCFSA methodology.

Panel C.1		Balance Sheet Structure as of "Reporting Date"																												15			
		Floating IR (also included all NMDs classified as non-core)																						Fixed IR (also included a) CU's administrated Dep									
		EVE Metric												NII Metric										EVE Metric									
		Parallel										Non-Parallel				Parallel										Parallel							
		-300 bps	-200 bps	-100 bps	-50 bps	Baseline	+50 bps	+100 bps	+200 bps	+300 bps	Short Rates Shock Down	Short Rates Shock Up	Steepener	Flattener	-300 bps	-200 bps	-100 bps	-50 bps	Baseline	+50 bps	+100 bps	+200 bps	+300 bps	-300 bps	-200 bps	-100 bps	-50 bps	Baseline	+50 bps	+100 bps	+200 bps		
ASSETS (irrespective of its accounting treatment)		0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0		
Central bank																																	
Interbank exposures																																	
Retail Mortgages																																	
Commercial Mortgages																																	
Other loans and advances																																	
Debt securities																																	
Linear Derivatives (including Swaps, Forward Starting																																	
Non Linear Derivatives (including Options, Swaptions)																																	
Other																																	
LIABILITIES (irrespective of its accounting treatment)		0	0	0		0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0		
Central bank																																	
Interbank exposures																																	
Debt securities issued																																	
NMDs: Retail Transactional																																	
NMDs: Retail Non-Transactional																																	
NMDs: Wholesale non-transactional																																	
NMDs: Wholesale transactional																																	
Term Deposits-Redeemable																																	
Term Deposits-Non-redeemable																																	
Term Deposits-Registered Plans																																	
Term Deposits-Other																																	
Linear Derivatives (including Swaps, Forward Starting																																	
Non Linear Derivatives (including Options, Swaptions)																																	
Other																																	

Interest Rate Shock Scenario	Interest Rate Shock in bps
Short	300
Long	150

TAB: IRRBB Results – BCFSA

The EVE and NII metrics are calculated in this tab based on BCFSA methodology and BCFSA proposed parameters for shaping scalar and time buckets:

- Classify each balance sheet position as:
 - Fixed interest rate position; or
 - Floating interest rate position
- Classify into asset or liability classes
- Discount curve perturbation based on scenarios (*Row 7*).
- EVE and NII metrics for each:
 - Scenario; and
 - Asset and liability position

This tab records the EVE and NII metrics based on

- BCFSA IRRBB methodology, and
- BCFSA proposed time buckets and shaping scalar

TAB: NMDs behavioural assumptions

Interest rate changes lead to changes in classification of **Non-Maturity Deposits (NMDs)** into:

- core;
- non-core
- Based on credit union's own methodology, NMDs are classified into:
 - transactional;
 - non-transactional
- Weighted average repricing captures change in the weighted average value of NMDs between:
 - the baseline and parallel up; and/or
 - parallel down movements of the discount curve

This tab records Non-Maturity Deposit (NMD) classification changes based on interest rate scenarios.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1																		
2		"Reporting Date"																
3		Exposure Amount	Average yield (%)	% Core and Non core baseline		% Core and Non core parallel down		% Core and Non core parallel up		Weighted average repricing baseline			Weighted average repricing down			Weighted average repricing up		
4				Core	Non-Core	Core	Non-Core	Core	Non-Core	Core	Non-Core	Total	Core	Non-Core	Total	Core	Non-Core	Total
5	NMD Classification	0	#DIV/0!									#DIV/0!			#DIV/0!			#DIV/0!
6	<u>NMDs: Retail Transactional</u>	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	Retail Transactional				100.00%		100.00%		100.00%			0.00			0.00			0.00
8	<u>NMDs: Retail Non-Transactional</u>	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	Retail Non-Transactional				100.00%		100.00%		100.00%			0.00			0.00			0.00
10	<u>NMDs: Wholesale non-transactional</u>	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	Wholesale non-transactional				100.00%		100.00%		100.00%			0.00			0.00			0.00
12	<u>NMDs: Wholesale transactional</u>	0	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	Wholesale transactional				100.00%		100.00%		100.00%			0.00			0.00			0.00
14	<u>brokered wholesale</u>																	
15																		
16																		
17																		
18																		
19		Jun-24																
20		Historical calibration window		Last date model calibration														
21																		
22		Start date	End date															
23	NMDs: Retail Transactional																	
24	NMDs: Retail Non-Tranctional																	
25	NMDs: Wholesale non-transactional																	
26	NMDs: Wholesale transactional																	
27																		
28																		
29																		
30																		
31																		

TAB: Stratification Retail NMD

This tab is to record the NMDs that exist on the credit unions' books as of the reporting date:

- NMD balance (in CAD) and number of accounts for each NMD type
- The limits/bounds in this tab are arbitrary and flexible. Credit Unions are encouraged to change these bounds during reporting if such changes result in better classification and representation of requested data

This tab records the
Non-Maturity Deposits
as of the reporting date

	A	B	C
1	Stratification of Retail NMD accounts		
2	"Reporting Date"- Reporting currency		
3			
4		Exposure Amount [CAD]	Account Count
5	Total retail NMDs	0	
6	1. Natural persons	0	
7	NMDs: Retail Transactional	0	
8	Individual depositor amount < 200		
9	200 <= Individual depositor amount < 500		
10	500 <= Individual depositor amount <1000		
11	1000 <= Individual depositor amount < 1500		
12	1500 <= Individual depositor amount < 2000		
13	2000 <= Individual depositor amount < 2500		
14	2500 <= Individual depositor amount < 3000		
15	3000 <= Individual depositor amount < 3500		
16	3500 <= Individual depositor amount < 4000		
17	4000 <= Individual depositor amount < 4500		
18	4500 <= Individual depositor amount < 5000		
19	Individual depositor amount =>5000		
20	NMDs: Retail Non-Transactional	0	
21	Individual depositor amount < 200		
22	200 <= Individual depositor amount < 500		
23	500 <= Individual depositor amount <1000		
24	1000 <= Individual depositor amount < 1500		
25	1500 <= Individual depositor amount < 2000		
26	2000 <= Individual depositor amount < 2500		
27	2500 <= Individual depositor amount < 3000		
28	3000 <= Individual depositor amount < 3500		
29	3500 <= Individual depositor amount < 4000		
30	4000 <= Individual depositor amount < 4500		
31	4500 <= Individual depositor amount < 5000		
32	Individual depositor amount =>5000		

33	2. SME's	0	
34	NMDs: Retail Transactional	0	
35	Individual depositor amount < 1000		
36	1000 <= Individual depositor amount < 3000		
37	3000 <= Individual depositor amount <5000		
38	5000 <= Individual depositor amount < 7000		
39	7000 <= Individual depositor amount < 9000		
40	9000 <= Individual depositor amount < 11000		
41	11000 <= Individual depositor amount < 13000		
42	13000 <= Individual depositor amount < 15000		
43	15000 <= Individual depositor amount < 17000		
44	17000 <= Individual depositor amount < 19000		
45	19000 <= Individual depositor amount < 21000		
46	21000 <= Individual depositor amount < 23000		
47	23000 <= Individual depositor amount < 25000		
48	Individual depositor amount =>25000		
49	NMDs: Retail Non-Transactional	0	
50	Individual depositor amount < 1000		
51	1000 <= Individual depositor amount < 3000		
52	3000 <= Individual depositor amount <5000		
53	5000 <= Individual depositor amount < 7000		
54	7000 <= Individual depositor amount < 9000		
55	9000 <= Individual depositor amount < 11000		
56	11000 <= Individual depositor amount < 13000		
57	13000 <= Individual depositor amount < 15000		
58	15000 <= Individual depositor amount < 17000		
59	17000 <= Individual depositor amount < 19000		
60	19000 <= Individual depositor amount < 21000		
61	21000 <= Individual depositor amount < 23000		
62	23000 <= Individual depositor amount < 25000		
63	Individual depositor amount =>25000		
64			
65			
66			

TAB: Other behavioural models

This tab is to record the dispersion of models used to model prepayment of mortgages and pre-withdrawal of term deposits under different interest rate scenarios:

- If there are no behavioural models being used, record notional amounts of:
 - fixed rate retail loans subject to prepayment risk; and/or
 - retail term deposits subject to early redemption risk

This tab records the dispersion of behavioural models

	A	B	C	D	E	F	G	H	I	J
1	Other Behavioural Models. Reporting Currency									
2	"Reporting Date"									
3		Notional Amount (Total)	Of which: Subject to Behavioural modelling (%)	Amount subject to modelling	Baseline Scenario (behavioural)	Parallel Shock Down (conditional)	Parallel Shock Up (conditional)	Starting date model calibration	End date model calibration	Last date of model calibration
4	Fixed Rates retail loans subject to Prepayment risk									
5	Time window of model calibration and last calibration date									
6	Notional amount			0						
7	Conditional Prepayment Rates (annualized average) (%)									
8										
9	Retail Term deposits subject to early redemption risk									
10	Time window of model calibration and last calibration date									
11	Notional amount			0						
12	Conditional Redemption Rates (cumulative average) (%)									
13	Pass Through rate (%)									
14										
15										
16										
17										
18										
19										
20										
21										
22										
23										
24										
25										

QIS Reporting

Demonstration of Excel Reporting Template

Refer to Excel File:

QIS_IRRBB_CUNAME_REPORTING DATE.xlsx

QIS reporting

1. Excel file “**QIS_IRRBB_CUNAME_REPORTING DATE.XLSX**” with inputs populated and calculated as of reporting date
2. All the underlying data used. This should include monthly granular data (as of month end), on:
 - Mortgages;
 - Deposits;
 - Derivatives;
 - Debt securities; and
 - Valuation curves and discount curves used in existing methodologies
3. Documentation and data on any internal model used, including those used for behaviour-modelling and yield-curve modelling, including model specifications, model inputs, and model outputs

QIS Reporting for
Credit unions and
Central 1

QIS reporting

1. If there are any market index linked NMDs/term deposits/product offerings, please include:
 - a) Explanation of why such products are not considered as exposed to market risk; and
 - b) Term sheets of a sample hedge of such products, if the positions are hedged
2. Documentation and data on any internal model used, including those used for behaviour modelling and yield curve modelling, including model specifications, model inputs, and model outputs

QIS Reporting for
Credit unions
Central 1

QIS Reporting

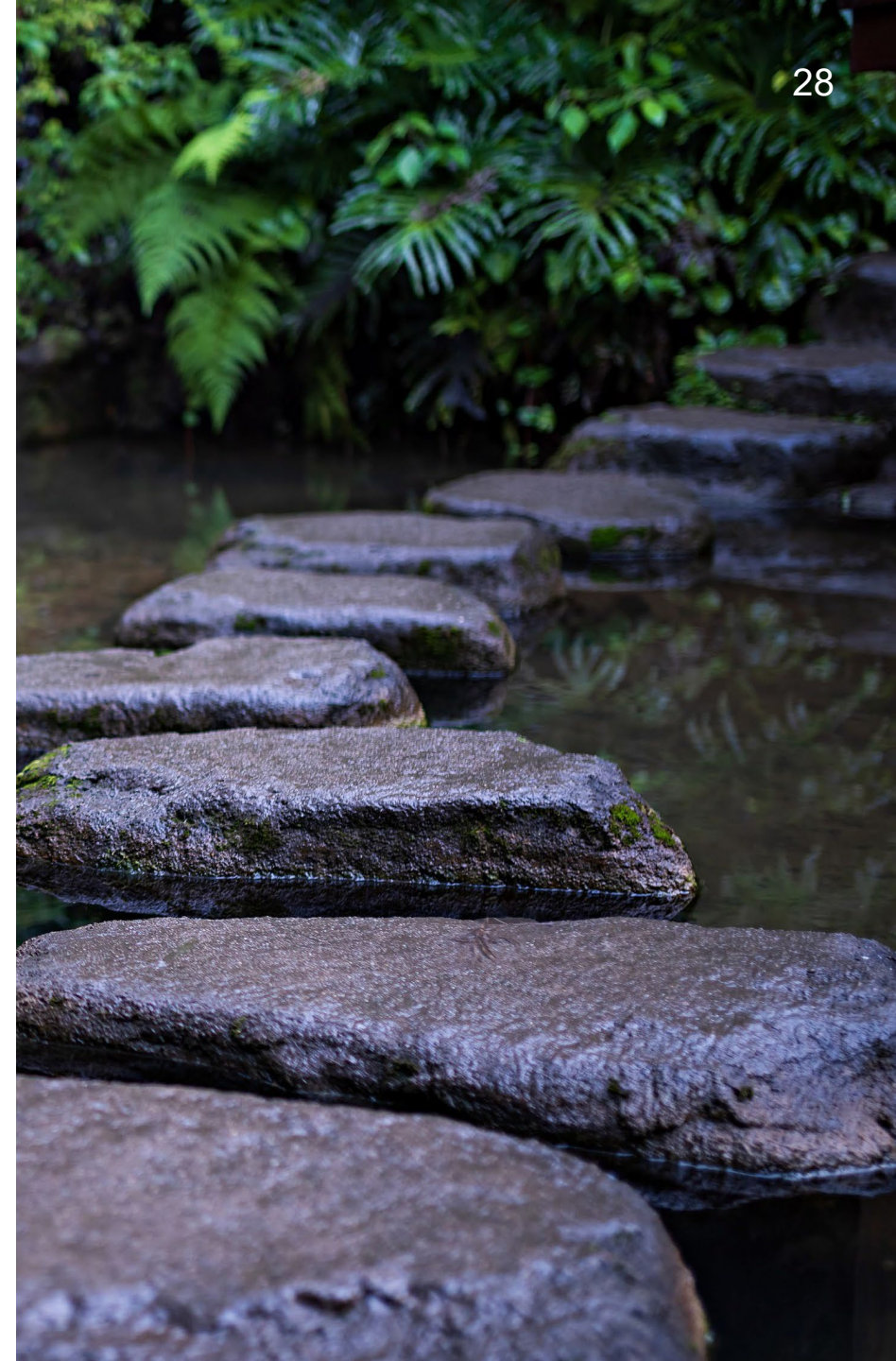
1. Data on any hedges used in banking book exposure management, including term sheets for such hedges. The hedge need not be for interest rate risk mitigation only but can include equity, FX or commodity risk also. Please also provide the corresponding hedged positions in a separate document.
2. Any additional data the credit union thinks is relevant to the QIS exercise.

QIS reporting for
Credit unions and
Central 1

Next Steps

IRRBB Quantitative Impact Study Timeline & Next Steps

- **First submission via IRIS: November 15, 2024**
- Quarterly submission for five consecutive quarters:
 - September 2024 (submit by November 15, 2024);
 - December 2024 (submit by February 10, 2025);
 - March 2025 (submit by April 30, 2025);
 - June 2025 (submit by July 31, 2025); and
 - September 2025 (submit by October 31, 2025)
- Final decision on approach will be based on the QIS findings, and consultation with credit unions
- BCFSA plans to release a consultation paper on market risk approach in early 2026



Questions?

Contact: CUCapital@bcfsa.ca

Please reach out to
CUCapital@bcfsa.ca if you have
detailed questions following the
session.



Thank you.