Royal Bank of Canada

Pillar 3 Report

As at October 31, 2022

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Caution regarding forward-looking statements

From time to time, we make written or oral forward-looking statements within the meaning of certain securities laws, including the "safe harbour" provisions of the *United States Private Securities Litigation Reform Act of 1995* and any applicable Canadian securities legislation. We may make forward-looking statements in this Pillar 3 Report, our 2022 Annual Report, in other filings with Canadian regulators or the SEC, in other reports to shareholders, and in other communications. Forward-looking statements are typically identified by words such as "believe", "expect", "foresee", "forecast", "anticipate", "intend", "estimate", "goal", "commit", "target", "objective", "plan" and "project" and similar expressions of future or conditional verbs such as "will", "may", "might", "should", "could" or "would". By their very nature, forward-looking statements require us to make assumptions and are subject to inherent risks and uncertainties, which give rise to the possibility that our predictions, forecasts, projections, expectations or conclusions will not prove to be accurate, that our assumptions may not be correct and that our financial performance and management objectives, vision and strategic goals will not be achieved. We caution readers not to place undue reliance on these statements as a number of risk factors could cause our actual results to differ materially from the expectations expressed in such forward-looking statements. Additional information about certain risk factors can be found in the Caution regarding forward-looking statements and risk sections of our 2022 Annual Report. When relying on our forward-looking statements to make decisions with respect to us, investors and others should carefully consider these risk factors as well as other uncertainties and potential events. Except as required by law, we do not undertake to update any forward-looking statement, whether written or oral, that may be made from time to time by us or on our behalf.

About Royal Bank of Canada

Royal Bank of Canada is a global financial institution with a purpose-driven, principles-led approach to delivering leading performance. Our success comes from the 95,000+ employees who leverage their imaginations and insights to bring our vision, values and strategy to life so we can help our clients thrive and communities prosper. As Canada's biggest bank, and one of the largest in the world based on market capitalization, we have a diversified business model with a focus on innovation and providing exceptional experiences to our 17 million clients in Canada, the U.S. and 27 other countries. Learn more at rbc.com.

Our business segments include Personal & Commercial Banking, Wealth Management, Insurance, Investor & Treasury Services, and Capital Markets. Our business segments are supported by Corporate Support, which consists of Technology & Operations and Functions. Technology & Operations provides the technological and operational foundation required to effectively deliver products and services to our clients, while Functions includes our finance, human resources, risk management, internal audit and other functional groups, as well as our corporate treasury function.

Capital framework

Our consolidated regulatory capital requirements are determined by guidelines issued by the Office of the Superintendent of the Financial Institutions (OSFI), which are based on the Basel III framework adopted by the Basel Committee on Banking Supervision (BCBS).

The Basel III framework integrates three "Pillars" to establish a robust foundation for banking supervision and financial stability:

- Pillar 1 prescribes minimum capital requirements and addresses capital adequacy, including standards for calculating risk-weighted assets (RWA);
- Pillar 2 requires the establishment of internal assessment processes and supervisory review to evaluate the risk profile and capital adequacy of banks;
- Pillar 3 enhances the consistency and comparability of risk and capital profiles between banks and across jurisdictions for market participants through meaningful disclosures.

Under Basel III, banks use defined approaches to calculate their minimum regulatory capital required to support various risks and exposure types including credit risk, counterparty credit risk, market risk, operational risk, and securitizations exposures. Refer to the "Capital management" section of our 2022 Annual Report for further information on calculation approaches. Refer to the following sections in this report for further information on:

- Capital
- Credit Risk
- Counterparty Credit Risk
- Market Risk
- Operational Risk
- Securitization Exposures

Capital framework (continued)

In January 2015, the BCBS published the "*Revised Pillar 3 Disclosure Requirements*" (Revised Standards) to encourage market discipline through regulatory disclosure requirements. The Revised Standards require comprehensive disclosure of our risks and regulatory capital including our methodologies used in calculating capital requirements instituted under Pillar 1. Existing requirements in the areas of credit risk, counterparty credit risk and securitization activities were replaced by the Revised Standards. OSFI mandated the domestic implementation of the first phase of the Revised Standards for Canadian domestic systemically important banks (D-SIBs) for the reporting period ending October 31, 2018. This Pillar 3 report provides disclosures reflective of this first phase of the Revised Standards. In addition, this Pillar 3 report provides disclosure required under OSFI's May 2018 Capital Disclosure Requirements Guideline.

In March 2017, the BCBS issued its second phase of the Pillar 3 disclosure requirements entitled, "*Pillar 3 disclosure requirements – consolidated and enhanced framework*". The disclosure standard consolidates all existing Pillar 3 disclosure requirements of the Basel III framework, including the leverage and liquidity ratios disclosure templates.

In December 2018, the BCBS issued its third and final phase (phase three) of the Pillar 3 disclosure requirements, *Pillar 3 disclosure requirements – updated framework.* This phase incorporates revisions and additions to the Pillar 3 framework arising from the finalization of the Basel III reforms in December 2017, such as additional disclosure requirements comparing RWA as determined by banks' internal models against results based on the Standardized Approach, and new disclosure requirements on asset encumbrance and capital distribution constraints. The phase three requirements, together with the phase one and two disclosure requirements released in January 2015 and March 2017, respectively, complete the Pillar 3 framework. On March 27, 2020, OSFI announced that it would delay its implementation of the phase three BCBS Pillar 3 disclosure requirements to January 31, 2023. On March 11, 2021, OSFI released for public consultation its draft revised Pillar 3 guideline incorporating the domestic implementation of all three phases to be effective in fiscal 2023. This Pillar 3 guideline was finalized by OSFI on January 31, 2022 with an implementation date requirement of April 30, 2023. Our Pillar 3 disclosures will be updated to reflect this finalized OSFI disclosure guideline requirements. On November 11, 2021, BCBS finalized revisions to its market risk disclosures which we expect OSFI will also incorporate in due course into its disclosure requirements for market risk, the framework which is effective in Q1 2024.

Effective November 1, 2018, OSFI adopted the BCBS frameworks related to the Standardized Approach for measuring counterparty credit risk (SA-CCR), capital requirements for bank exposures to central counterparties (CCPs) and the revised securitization framework as incorporated in OSFI's Capital Adequacy Requirements (CAR) guideline.

On November 1, 2019, the impact of adoption of IFRS 16 *Leases*, and removal of allowed grandfathering and transitioning treatment for certain securitization and counterparty credit risk exposures was incorporated in our measurement of regulatory capital. In addition, we adopted, the Standardized Approach for consolidated regulatory reporting of operational risk as the use of the Advanced Measurement Approach was discontinued by OSFI. This Pillar 3 report reflects the CAR guideline requirements for all periods, including prior period comparatives.

To address the economic disruption caused by the COVID-19 pandemic in Q2 2020, OSFI announced a series of regulatory capital modifications as described in our Capital management section of our 2020 Annual report and further updated as described in the Capital Management section of our 2021 and 2022 Annual Reports. Announced changes included the reduction of the domestic stability buffer to 1% of total RWA while also providing transitional expected credit loss (ECL) modifications over 3 years and risk-weight exclusions for certain exposures. In addition, OSFI also allowed delaying for six months, from the date of deferral, the past due treatment of all loan deferrals requested by clients. On August 31, 2020, OSFI amended this deferral treatment allowing any deferrals issued on or after August 31 to September 30, 2020 to only be exempt from past due treatment for a period of 3 months. Therefore, any deferrals given to clients on or after October 1, 2020 must follow the past due treatment required under the CAR guidelines. Our reported figures reflect this guidance and further updated guidance from OSFI including the raising of the domestic stability buffer to 2.5% effective October 31, 2021, as fully described in our Capital management section of our 2022 Annual Report.

Since Q2 2020, our disclosure for KM1: Key Capital and Leverage metrics template includes disclosure of our capital ratios assuming transitional ECL modifications had not been applied, as required by OSFI.

Refer to the Capital management section of our 2022 Annual Report for further information on upcoming regulatory developments which were announced during the quarter.

Leverage framework

On October 30, 2014, OSFI issued its "Leverage Requirements (LR)" guideline, which reflected its adoption of the BCBS "Basel III leverage ratio framework and disclosure requirement" effective the first fiscal quarter of 2015. The LR guideline requires banks to disclose their leverage ratio and its underlying components. The leverage ratio is defined as the capital measure divided by the leverage exposure measure. The capital measure is defined as Tier 1 capital and the leverage exposure measure is the sum of (a) on-balance sheet exposures; (b) derivative exposures; (c) securities financing transaction (SFT) exposures and (d) off-balance sheet items.

Unmanaged leverage can lead to unwarranted corrective measures due to excessive exposure growth or capital reduction, causing detriment to the bank's balance sheet and overall shareholders' wealth. Maintaining a prescribed minimum level of leverage helps neutralize leverage risk in the event of unexpected economic crises. OSFI requires maintenance of a minimum leverage ratio of 3% at all times.

On October 30, 2018, OSFI published its updated LR guideline, effective November 1, 2018. The revisions aligned the LR guideline with OSFI's adoption of the BCBS *"Standardized approach for measuring counterparty credit risk exposures"* and *Revisions to the securitization framework"*. On November 1, 2019, the impact of adoption of IFRS 16 *Leases*, was incorporated into our leverage ratio.

In addition to the pre-existing 3% leverage ratio minimum requirement, the BCBS introduced an additional leverage ratio buffer requirement for global systemically-important banks (G-SIB) as part of their Basel III reforms *"Basel III: Finalizing post-crisis reforms* (December 2017)*"*. The G-SIB leverage ratio must be met with Tier 1 capital and is set at 50% of a G-SIB's higher-loss absorbency risk-weighted requirement. On July 16, 2018 OSFI announced that all Canadian D-SIBs will be held to the 3.5% minimum leverage requirements including RBC which has been designated a G-SIB. This minimum leverage requirement has now been incorporated into the revised LR guideline effective Q2 2023 released by OSFI on January 31, 2022.

On November 20, 2018, OSFI updated its Leverage disclosure guidelines, which are based on BCBS phase two disclosure requirements, to reflect the revisions to the LR and CAR guidelines mentioned above. Refer to our Leverage disclosures included in this report, as required by OSFI.

To address the economic disruption caused by the COVID-19 pandemic in Q2 2020, OSFI announced two leverage ratio modifications. The first leverage ratio modification required the exclusion of central bank reserves and sovereign-issued securities that qualify as high quality liquid assets from our total leverage exposure amount for a period of one year ending April 30, 2021. The second modification required the exclusion of loans issued under the US Government Payment Protection Program (PPP) from our total leverage exposure amount. On November 5, 2020, OSFI extended the allowed exclusion of central bank reserves and sovereign-issued securities another eight months to December 31, 2021. On August 12, 2021 OSFI announced that sovereign-issued securities would no longer be eligible for exclusion effective January 1, 2022 but that central bank reserves would continue to eligible for exclusion until further notice. On September 13, 2022, OSFI announced that central bank reserves would no longer be eligible for exclusion starting April 1, 2023. Our reported leverage figures reflect this guidance as fully described in our Capital management section of our 2022 Annual Report.

Since Q2 2020, our disclosure of LR2: Leverage ratio common disclosure template includes disclosure of our leverage ratio assuming transitional ECL modification had not been applied, as required by OSFI.

TLAC framework

The Canadian Bail-in regime, including OSFI's Total Loss Absorbing Capacity (TLAC) guideline, came into effect on September 23, 2018. The purpose of the TLAC requirement is to address the sufficiency of a Canadian D-SIB's loss absorbing capacity in supporting its recapitalization in the event of its failure. TLAC is defined as the aggregate of Tier 1 capital, Tier 2 capital, and other TLAC instruments (senior bail-in debt), which includes senior unsecured debt with an original term to maturity of greater than 400 days and remaining term to maturity of greater than 365 days. Under the Bail-in regime, claims of some creditors whose claims otherwise rank equally with those of the holders holding bail-inable notes would be excluded from a bail-in conversion and thus the holders and beneficial owners of bail-inable notes will have to absorb losses ahead of these other creditors as a result of the bail-in conversion.

TLAC requirements establish two minimum standards; which were required to be met effective November 1, 2021: the risk-based TLAC ratio, which builds on the risk-based capital ratios described in the CAR guideline, and the TLAC leverage ratio, which builds on the leverage ratio described in OSFI's LR guideline. The risk-based TLAC ratio is defined as TLAC divided by Total risk-weighted assets (RWA) while the TLAC leverage ratio is defined as TLAC divided by the Leverage ratio exposure. OSFI requires systemically important banks to maintain a minimum TLAC ratio of 24% (inclusive of the revised domestic stability buffer (DSB) of 2.5%) and a TLAC leverage ratio of 6.75%. We began issuing TLAC eligible debt in Q4 2018 and our TLAC ratio is expected to increase through normal course refinancing of maturing debt. More details on our TLAC issuance is available in our Capital management section of our 2022 Annual Report.

In May 2018, OSFI published its TLAC Disclosure guideline for Canadian D-SIBs. The disclosure requirements reflect the BCBS TLAC disclosure requirements as outlined in the BCBS March 2017 phase two requirements mentioned above. Refer to our TLAC disclosures included in this report, as required by OSFI.

To reflect the transitional ECL modification provided by OSFI, as discussed in the Capital framework and Leverage framework sections above, since Q2 2020, our disclosure of KM2: Key metrics – TLAC requirements includes both our TLAC ratio and TLAC leverage ratio assuming the transitional ECL modification had not been applied, as required by OSFI.

DISCLOSURE MAP

Pillar 3 Requirement	Pillar 3 Requirement		2022 Annual Report section	Sub-section	2022 Annual Report Reference
Overview of key metrics, risk management and RWA	KM1				
		a) Business model and risk profile	Top and emerging risks	Top and emerging risks	58-60
			Risk management overview	Risk management principles	60
				Risk drivers	60-61
			Enterprise risk management	Risk governance	61-62
				Risk appetite	63
				Risk measurement	63-64
				Risk control	64-65
		b) Risk governance structure	Enterprise risk management	Risk governance	61-62
				Risk control	64-65
		c) Communication and enforcement of risk culture within the bank	Enterprise risk management	Culture and conduct risk	96
		d) Scope and main features of risk measurement systems	Enterprise risk management	Risk measurement	63-64
		e) Risk information reporting	Enterprise risk management	Risk control - *Risk monitoring and reporting*	65
		f) Stress testing	Enterprise risk management	Risk measurement – *Stress testing*	64
			Market risk	Stress tests	76
			Systemic risk	Systemic risk	99-100
		g) Strategies and processes applied to manage, hedge and mitigate risks	Enterprise risk management	Risk appetite	63
				Risk measurement	63-64
				Risk control	64-65
			Credit risk	Overview	66
				Credit risk measurement	66-67
				Credit risk assessment	67-69
				Credit risk mitigation	69
				Credit risk approval	70
				Credit risk administration	70
			Market risk	Market risk controls – FVTPL positions	76
				Stress tests	76
				Market risk controls – Interest Rate Risk in the Banking Book (IRRBB) positions	78
				IRRBB measurement	78
				Non-trading foreign exchange rate risk	79
			Liquidity and funding risk	Overview	81
				Risk control	82
				Risk measurement	82
				Funding	84-86
				Liquidity Coverage Ratio (LCR)	88-89
				Net Stable Funding Ratio (NSFR)	89-91
			Insurance risk	Insurance risk	94
			Operational risk	Overview	94
				Operational risk framework	94-96
			Regulatory compliance risk	Regulatory compliance risk	96-97
			Strategic risk	Strategic risk	97
			Reputation risk	Reputation risk	97-98
			Legal and regulatory environment risk	Legal and regulatory environment risk	98-99
			Competitive risk	Competitive risk	99
			Systemic risk	Systemic risk	99-100
			Environmental and social risk	Environmental and social risk	101-104
			Consolidated Financial Statements	Note 9 – Derivative financial instruments and hedging activities - *Derivatives issued for trading purposes*	188
				Note 9 – Derivative financial instruments and hedging activities - *Derivatives issued for other-than-trading purposes*	188
				Note 9 – Derivative financial instruments and hedging activities - *Derivative-related credit risk*	190-191
	OV1				

DISCLOSURE MAP (continued)

Pillar 3 Requirement	Pillar 3 Requirement		2022 Annual Report section	Sub-section	2022 Annual Report Reference
Linkages between financial statements and regulatory exposures	LI1				
	LI2				
	LIA				
Composition of Capital	CC1				
	CC2				
	CCA [1]	Main features of regulatory capital instruments and of other TLAC-eligible instruments			
Macroprudential supervisory measures	GSIB 1 [1,2]	Disclosure of G-SIB indicators			
Credit risk	CRA	a) Translation of the business model into the components of the bank's credit risk profile	Credit risk	Overview	66
				Measurement of economic and regulatory capital - *Gross credit risk exposure*	67
		b) Criteria and approach used for defining credit risk management policy and for setting credit risk limits	Enterprise risk management	Risk governance	61-62
				Risk appetite	63
				Risk measurement	63-64
				Risk control - *Delegated risk approval authorities and risk limits*	65
			Credit risk	Overview	66
				Credit risk assessment	67-69
				Credit risk mitigation	69
				Credit risk approval	70
		c) Structure and organization of the credit risk management and control function	Enterprise risk management	Risk governance	61-62
				Risk control	64-65
		d) Interaction between the credit risk management, risk control, compliance and internal audit functions	Enterprise risk management	Risk governance	61-62
		e) Scope and content of the reporting on credit risk exposure to the executive management and to the board of directors	Enterprise risk management	Risk governance	61-62
				Risk control - *Risk monitoring and reporting*	65
	CR1				
	CR2 [3]				
	CRB	a) The scope and definitions of "past due" and "impaired" exposures used for accounting purposes and the differences, if any, between the definition of past due and default for accounting and regulatory purposes	Consolidated Financial Statements	Note 2 – Summary of significant accounting policies, estimates and judgments - Allowance for credit losses - *Definition of default* *Credit impaired financial assets (Stage 3)*	149
				Note 5 – Loans and allowance for credit losses - *Loans past due but not impaired*	182
		b) The extent of past-due exposures (more than 90 days) that are not considered to be impaired and the reasons for this	Consolidated Financial Statements	Note 5 – Loans and allowance for credit losses - *Loans past due but not impaired*	182
		c) Description of methods used for determining accounting provisions for credit losses	Consolidated Financial Statements	Note 2 – Summary of significant accounting policies, estimates and judgments - Allowance for credit losses	147
		Description of the categorization of ECL accounting provisions (general and specific) for standardized approach exposures	n/a	n/a – For regulatory calculations under both the Standardized and IRB approaches, the IFRS 9 stage 3 allowances are considered to be specific allowances and the IFRS 9 stage 1 and stage 2 allowances are considered to be general allowances	
		d) The bank's own definition of a restructured exposure	Consolidated Financial Statements	Note 2 – Summary of significant accounting policies, estimates and judgments - Allowance for credit losses - *Modifications*	149-150

[1] CCA is available at https://www.rbc.com/investor-relations/regulatory-information.html.
[2] G-SIB1 is provided on page 44 of our Q1 2022 Report to Shareholders available at https://www.rbc.com/investor-relations/regulatory-information.html.
[3] Requirement for disclosure of this table is only semi-annual.

DISCLOSURE MAP (continued)

Pillar 3 Requirement	Pillar 3 Requirement		2022 Annual Report section	Sub-section	2022 Annual Report Reference
Credit risk (continued)	CRC	a) Core features of policies and processes for, and an indication of the extent to which the bank makes use of, on– and off–balance sheet netting	Credit risk	Credit risk assessment – *Counterparty credit risk*	68
			Consolidated Financial Statements	Note 9 – Derivative financial instruments and hedging activities - *Derivative-related credit risk*	190-191
				Note 30 – Offsetting financial assets and financial liabilities	225-226
		b) Core features of policies and processes for collateral evaluation and management	Credit risk	Credit risk mitigation - *Collateral*	69
		c) Information about market or credit risk concentrations under the credit risk mitigation instruments used	Credit risk	Credit risk mitigation	69
				Credit risk approval - *Credit risk limits*	70
			Consolidated Financial Statements	Note 9 – Derivative financial instruments and hedging activities	187-196
	CR3 [3]				
	CRD				
	CR4				
	CR5				
	CRE				
	CR6				
	CR7				
	CR8				
	CR9 [4]				
	CR10		n/a	n/a	n/a
Counterparty credit risk	CCRA	a) Risk management objectives and policies related to counterparty credit risk	Credit risk	Credit risk assessment – *Counterparty credit risk*	68
			Consolidated Financial Statements	Note 9 – Derivative financial instruments and hedging activities - *Derivative-related credit risk*	190-191
		b) The method used to assign the operating limits defined in terms of internal capital for counterparty credit exposures and for CCP exposures	Credit risk	Credit risk assessment – *Counterparty credit risk*	68
		c) Policies relating to guarantees and other risk mitigants and assessments concerning counterparty credit risk, including exposures towards CCPs	Credit risk	Credit risk assessment – *Counterparty credit risk*	68
			Consolidated Financial Statements	Note 9 – Derivative financial instruments and hedging activities - *Derivative-related credit risk*	190-191
			Consolidated Financial Statements	Note 30 – Offsetting financial assets and financial liabilities	225-226
		d) Policies with respect to wrong-way risk exposures	Credit risk	Credit risk assessment – *Wrong-way risk*	69
		e) The impact in terms of the amount of collateral that the bank would be required to provide given a credit rating downgrade	Liquidity and funding risk	Credit ratings	87
	CCR1				
	CCR2				
	CCR3				
	CCR4				
	CCR5 [3]				
	CCR6				
	CCR7		n/a	n/a	n/a
	CCR8	f) Exposures to central counterparties			

[3] Requirement for disclosure of this table is only semi-annual.
[4] Requirement for disclosure of this table is only annual.

DISCLOSURE MAP (continued)

Pillar 3 Requirement	Pillar 3 Requirement		2022 Annual Report section	Sub-section	2022 Annual Report Reference
Securitization	SECA	a) Objectives in relation to securitization activities	Off-balance sheet arrangements	Off-balance sheet arrangements	56-58
			Consolidated Financial Statements	Note 7 – Derecognition of financial assets	182-183
			Consolidated Financial Statements	Note 8 – Structured entities	183-187
		b) List of SPEs where RBC is sponsor / provides implicit support	Consolidated Financial Statements	Note 8 – Structured entities	183-187
		c) Accounting policies for securitization	Consolidated Financial Statements	Note 2 – Summary of significant accounting policies, estimates and judgments – *Basis of consolidation*	143-144
				Note 2 – Summary of significant accounting policies, estimates and judgments – *Derecognition of financial assets*	150
			Critical accounting policies and estimates	Consolidation of structured entities	116
		d) the names of external credit assessment institution (ECAIs) used for securitizations and the types of securitization exposure for which each agency is used	Capital management (also refer to CRD in this document)	Regulatory capital approach for securitization exposures	114
		e) Use of Basel IAA for capital purposes	Credit risk	n/a	66-75
			Capital management	Regulatory capital approach for securitization exposures	114
		f) Use of other internal assessment for capital purposes	Credit risk	Credit risk assessment	67-69
	SEC1	Securitization exposures in the banking book			
	SEC2	Securitization activities in the trading book			
	SEC3	Securitization exposures in the banking book and associated regulatory capital requirements - bank acting as originator or as sponsor			
	SEC4	Securitization exposures in the banking book and associated capital requirements - bank acting as investor			
Market risk	MRA	a) Processes implemented to identify, measure, monitor and control the bank's market risks	Market risk	Market risk controls – FVTPL positions	76
				Stress tests	76
				Market risk measures – FVTPL positions	77-78
				Market risk measures for assets and liabilities of RBC Insurance	78
				Market risk controls – Interest Rate Risk in the Banking Book (IRRBB) positions	78
				IRRBB measurement	78
				Market risk measures – IRRBB Sensitivities	78-79
				Market risk measures for other material non-trading portfolios	79
		Policies for hedging risk and strategies/processes for monitoring the continuing effectiveness of hedges	Consolidated Financial Statements	Note 2 – Summary of significant accounting policies, estimates and judgements – *Hedge accounting*	151-152
		b) Description of the market risk governance structure established to implement the strategies and processes of the bank	Enterprise risk management	Risk governance	61-62
				Risk appetite	63
				Risk measurement	63-64
				Risk control	64-65
				Risk measurement – *Stress testing*	64
				Culture and conduct risk	96

DISCLOSURE MAP (continued)

Pillar 3 Requirement	Pillar 3 Requirement		2022 Annual Report section	Sub-section	2022 Annual Report Reference
Market risk (continued)	MRA (continued)	Description of the relationships and the communication mechanisms between the different parties involved in market risk management	Enterprise risk management	Risk governance	61-62
				Risk control	64-65
		c) Scope and nature of risk reporting and/or measurement systems	Enterprise risk management	Risk measurement	63-64
				Risk control	64-65
				Risk measurement – *Stress testing*	64
			Market risk	Market risk controls – FVTPL positions	76
				Stress tests	76
				Market risk measures – FVTPL positions	77-78
				Market risk measures for assets and liabilities of RBC Insurance	78
				Market risk controls – Interest Rate Risk in the Banking Book (IRRBB) positions	78
				IRRBB measurement	78
				Market risk measures – IRRBB Sensitivities	78-79
				Market risk measures for other material non-trading portfolios	79
	MRB	c) General description of the models (VaR/stressed VaR)	Market risk	Market risk controls – FVTPL positions	76
		g) Description of stress testing applied to the modelling parameters	Market risk	Stress tests	76
	MR1				
	MR2				
	MR3				
	MR4 [3]				
Leverage	LR1				
	LR2				
Total loss absorbing capacity	KM2				
	TLAC1				
	TLAC2				
	TLAC3				
Operational Risk		a) Details of the approach for operational risk capital assessment for which the bank qualifies	Operational risk	Operational risk capital	96
		b) Description of the advanced measurement approaches for operational risk (AMA)[5]	n/a	n/a	n/a
		c) For banks using the AMA, a description of the use of insurance for the purpose of mitigating operational risk[5]	n/a	n/a	n/a
Interest rate risk in the banking book			Market risk	Market risk	76-81

[3] Requirement for disclosure of this table is only semi-annual.

[5] Effective November 1, 2019, OSFI discontinued the AMA approach.

OVERVIEW OF KEY METRICS, RISK MANAGEMENT AND RWA

KM1: Key Capital and Leverage metrics (at consolidated group level)

	(Millions of Canadian dollars)[1]	a October 31 2022	b July 31 2022	c October 31 2021	d YoY Change (a-c)
	Available capital (amounts)				
1	Common Equity Tier 1 (CET1)	76,945	76,907	75,583	1,362
1a	Common Equity Tier 1 with transitional arrangements for ECL provisioning not applied	76,774	76,773	75,163	1,611
2	Tier 1	84,242	84,207	82,246	1,996
2a	Tier 1 with transitional arrangements for ECL provisioning not applied	84,071	84,073	81,826	2,245
3	Total capital	93,850	93,857	92,026	1,824
3a	Total capital with transitional arrangements for ECL provisioning not applied	93,850	93,857	92,026	1,824
	Risk-weighted assets (amounts)				
4	Total risk-weighted assets (RWA)	609,879	589,050	552,541	57,338
	Risk-based capital ratios as a percentage of RWA				
5	Common Equity Tier 1 ratio	12.6%	13.1%	13.7%	(1.1)%
5a	Common Equity Tier 1 ratio with transitional arrangements for ECL provisioning not applied	12.6%	13.0%	13.6%	(1.0)%
6	Tier 1 ratio	13.8%	14.3%	14.9%	(1.1)%
6a	Tier 1 ratio with transitional arrangements for ECL provisioning not applied	13.8%	14.3%	14.8%	(1.0)%
7	Total capital ratio	15.4%	15.9%	16.7%	(1.3)%
7a	Total capital ratio with transitional arrangements for ECL provisioning not applied	15.4%	15.9%	16.7%	(1.3)%
	Additional CET1 buffer requirements as a percentage of RWA				
8	Capital conservation buffer requirement	2.5%	2.5%	2.5%	-
9	Countercyclical buffer requirement[2]	0.0%	0.0%	0.0%	-
10	Bank G-SIB and/or D-SIB additional requirements	1.0%	1.0%	1.0%	-
11	Total of bank CET1 specific buffer requirements (row 8 + row 9 + row 10)	3.5%	3.5%	3.5%	-
12	CET1 available after meeting the bank's minimum capital requirements (row 5 - 8%)[3]	4.6%	5.1%	5.7%	(1.1)%
	Basel III leverage ratio				
13	Total Basel III leverage ratio exposure measure	1,898,179	1,839,845	1,662,044	236,135
14	Basel III leverage ratio (row 2 / row 13)	4.4%	4.6%	4.9%	(0.5)%
14a	Basel III leverage ratio (row 2a / row 13) with transitional arrangements for ECL provisioning not applied	4.4%	4.6%	4.9%	(0.5)%

[1] This table incorporates the impact of expected credit loss (ECL) accounting on regulatory capital including transitional ECL provisioning modification granted by OSFI on Mar. 27, 2020. This ECL provisioning modification allowed reduced from a 75% after-tax exclusion rate for growth in Stage 1 and Stage 2 allowances in 2020 to a 50% after-tax exclusion rate in 2021 and a 25% after-tax exclusion rate in 2022. No ECL modification will be allowed in fiscal 2023.

[2] Bank specific countercyclical buffer requirement for Q4 2022 was not material, the amount which is determined based on our private sector exposures in jurisdictions identified by BCBS.

[3] 8% reflects minimum capital requirements which includes D-SIB/G-SIB surcharge, and excludes the OSFI Domestic Stability Buffer of 2.5% effective October 2021. Refer to the Capital management section of our 2022 Annual Report.

2022 vs. 2021

Our CET1 ratio was 12.6%, down 110 bps from last year, mainly reflecting RWA growth (excluding FX), share repurchases, the impact of our Brewin Dolphin acquisition, and the unfavourable impact of fair value OCI adjustments. These factors were partially offset by net internal capital generation, favourable net credit migration and model updates.

Our Tier 1 capital ratio of 13.8% was down 110 bps, reflecting the factors noted above under the CET1 ratio and a favourable impact from the net issuance of preferred shares.

Our Total capital ratio of 15.4% was down 130 bps, reflecting the factors noted above under the Tier 1 capital ratio and a favourable impact from the net issuance of subordinated debentures.

During the year, RWA was up $57 billion, mainly reflecting business growth in commercial and corporate lending, and residential mortgages, as well as the impact of foreign exchange translation. These factors were partially offset by favourable net credit migration, primarily in our wholesale portfolios, and model updates. The model updates mainly reflect the impact of the Q2 2020 period of significant market volatility no longer being reflected in our two-year historical VaR period. In our CET1 ratio the impact of foreign exchange translation on RWA is largely mitigated with economic hedges.

Our Leverage ratio of 4.4% was down 50 bps, mainly reflecting share repurchases, business-driven growth in leverage exposures, lower regulatory modifications, unfavourable impact of fair value OCI adjustments, and the impact of our Brewin Dolphin acquisition. These factors were partially offset by internal capital generation.

Leverage exposures increased by $236 billion mainly driven by business growth in retail and wholesale loans, and undrawn commitments. The impact of foreign exchange translation and lower regulatory modifications, mainly due to the reversal of the sovereign-issued securities qualifying as HQLA, also contributed to the increase.

OVA: Bank risk management approach

The table below presents an overview of Pillar 3 disclosure requirements that have been met within our 2022 Annual Report and incorporated by reference into this Pillar 3 report. Our 2022 Annual Report is available free of charge on our website at http://www.rbc.com/investorrelations

Pillar 3 disclosures requirement		2022 Annual Report section	Sub-section
a)	Business model and risk profile	Top and emerging risks	Top and emerging risks
		Risk management Overview	Risk management principles
			Risk drivers
		Enterprise risk management	Risk governance
			Risk appetite
			Risk measurement
			Risk control
b)	Risk governance structure	Enterprise risk management	Risk governance
			Risk control
c)	Communication and enforcement of risk culture within the bank	Operational risk	Culture and conduct risk
d)	Scope and main features of risk measurement systems	Enterprise risk management	Risk measurement
e)	Risk information reporting	Enterprise risk management	Risk control - *Risk monitoring and reporting*
f)	Stress testing	Enterprise risk management	Risk measurement - *Stress testing*
		Market risk	Stress tests
		Systemic risk	Systemic risk
g)	Strategies and processes applied to manage, hedge and mitigate risks	Enterprise risk management	Risk appetite
			Risk measurement
			Risk control
		Credit risk	Overview
			Credit risk measurement
			Credit risk assessment
			Credit risk mitigation
			Credit risk approval
			Credit risk administration
		Market risk	Market risk controls - FVTPL positions
			Stress tests
			Market risk controls - Interest Rate Risk in the Banking Book (IRRBB) positions
			IRRBB measurement
			Non-trading foreign exchange rate risk
		Liquidity and funding risk	Overview
			Risk control
			Risk measurement
			Funding
			Liquidity Coverage Ratio (LCR)
			Net Stable Funding Ratio (NSFR)

OVA: Bank risk management approach (continued)

Pillar 3 disclosures requirement		2022 Annual Report section	Sub-section
g)	Strategies and processes applied to manage, hedge and mitigate risks (continued)	Insurance risk	Insurance risk
		Operational risk	Overview
			Operational risk framework
		Regulatory compliance risk	Regulatory compliance risk
		Strategic risk	Strategic risk
		Reputation risk	Reputation risk
		Legal and regulatory environment risk	Legal and regulatory environment risk
		Competitive risk	Competitive risk
		Systemic risk	Systemic risk
		Environmental and social risk (including climate change)	Environmental and social risk (including climate change)
		Consolidated Financial Statements	Note 9 - Derivative financial instruments and hedging activities - *Derivatives issued for trading purposes*
			Note 9 - Derivative financial instruments and hedging activities - *Derivatives issued for other-than-trading purposes*
			Note 9 - Derivative financial instruments and hedging activities - *Derivative-related credit risk*

OV1: Overview of risk weighted assets (RWA)

The following table presents an overview of our RWA and the related minimum capital requirements by risk type.

		a	b	c	d	e
		RWA			Minimum capital requirement[1]	RWA
	(Millions of Canadian dollars)	October 31 2022	July 31 2022	October 31 2021	October 31 2022	Change (YoY)
1	**Credit risk (excluding counterparty credit risk)**	**406,601**	**391,932**	**354,442**	**32,528**	**52,159**
2	Of which Standardized approach (SA)	121,839	113,005	102,186	9,747	19,653
3	Of which Internal rating-based (IRB) approach	284,762	278,927	252,256	22,781	32,506
4	**Counterparty credit risk (CCR)**	**50,613**	**49,213**	**53,791**	**4,049**	**(3,178)**
4a	Of which other CCR	9,182	8,787	10,102	734	(920)
4b	Credit valuation adjustment (CVA)	15,682	14,997	18,104	1,255	(2,422)
5	Of which Standardised approach for counterparty credit risk (SA-CCR)[2]	25,749	25,429	25,585	2,060	164
6	Of which Internal model method (IMM)	-	-	-	-	-
7	Equity positions in banking book under market-based approach	2,561	2,562	2,814	205	(253)
8	Equity investments in funds – look-through approach	-	-	-	-	-
9	Equity investments in funds – mandate-based approach	3,419	3,335	2,944	274	475
10	Equity investments in funds – fall-back approach	43	110	45	3	(2)
11	Settlement risk	978	683	1,492	78	(514)
12	**Securitisation exposures in banking book**	**12,543**	**11,897**	**10,328**	**1,004**	**2,215**
13	Of which IRB ratings-based approach (SEC-IRBA)	-	-	-	-	-
14	Of which External ratings-based approach (SEC-ERBA)	9,572	9,020	7,982	766	1,590
15	Of which Standardized approach (SEC-SA)	2,971	2,877	2,346	238	625
16	**Market risk**	**35,342**	**34,551**	**34,806**	**2,827**	**536**
17	Of which Standardized approach (SA)	17,253	17,731	13,330	1,380	3,923
18	Of which Internal model approaches (IMA)	18,089	16,820	21,476	1,447	(3,387)
19	**Operational risk**	**77,639**	**75,813**	**73,593**	**6,211**	**4,046**
20	Of which Basic Indicator Approach	-	-	-	-	-
21	Of which Standardized Approach	77,639	75,813	73,593	6,211	4,046
22	Of which Advanced Measurement Approach[3] (AMA)	-	-	-	-	-
23	Amounts below the thresholds for deduction (subject to 250% risk weight)	20,140	18,954	18,286	1,611	1,854
24	Floor adjustment	-	-	-	-	-
25	**Total (1+4+7+8+9+10+11+12+16+19+23+24)**	**609,879**	**589,050**	**552,541**	**48,790**	**57,338**

[1] The minimum capital requirements for each category can be calculated by multiplying the total RWA by 8% as per OSFI CAR guidelines.

[2] Includes RWA associated with CCP exposures, which EAD is calculated based on SA-CCR.

[3] Effective November 1, 2019, OSFI discontinued the AMA approach.

2022 vs. 2021

Total RWA increased by $57 billion or 9.7%, driven by the following:

Credit risk
RWA increased by $52 billion, mainly reflecting business growth in commercial and corporate lending, and residential mortgages, as well as the impact of foreign exchange translation. These factors were partially offset by favourable net credit migration, primarily in our wholesale portfolios. The impact of foreign exchange translation on RWA is largely mitigated with economic hedges in our CET1 ratio.

Counterparty credit risk
RWA decreased by $3 billion, mainly due to client driven activity in our derivatives and securities financing transaction trading businesses.

Securitization exposures in banking book
RWA increased by $2 billion, mainly driven by client activity.

Market risk
RWA increased $0.5 billion, mainly driven by risk profile changes in our equity derivatives portfolio and higher energy prices, partially offset by the impact of the Q2 2020 period of significant market volatility no longer being reflected in our two-year historical VaR period.

Operational risk
RWA increased $4 billion, mainly driven by average revenue growth and our Brewin Dolphin acquisition.

RWA: Risk-Weighted Assets by Regulatory Approach

The following table provides details of our risk-weighted assets by type of risk and regulatory approach.

TOTAL CAPITAL RISK-WEIGHTED ASSETS [1]	Q4/2022 Risk-weighted assets All-in Basis						Q4/2022 Capital requirements	Risk-weighted assets All-in Basis			
(Millions of Canadian dollars, except percentage and per share amounts)	Exposure [2]	Average of risk weights [3]	Standardized approach	IRB approach	Other	Total [4]	Total [4]	Q3/2022 Total [4]	Q2/2022 Total [4]	Q1/2022 Total [4]	Q4/2021 Total [4]
Credit risk [5]											
Lending-related and other											
Residential mortgages[12]	500,986	8%	13,518	28,144	-	41,662	3,333	40,392	38,860	36,803	34,958
Other retail (Personal, Credit cards and Small business treated as retail)[12]	245,633	27%	8,307	57,199	-	65,506	5,240	64,404	63,622	64,343	63,422
Business (Corporate, Commercial, Medium-sized enterprises and Non-bank financial institutions)	476,896	50%	72,399	166,424	-	238,823	19,106	227,105	221,001	210,091	200,553
Sovereign (Government)	340,529	5%	3,034	12,876	-	15,910	1,273	15,393	14,542	14,758	14,412
Bank	30,348	18%	1,484	3,999	-	5,483	439	5,644	5,868	5,112	4,756
Total lending-related and other	**1,594,392**	**23%**	**98,742**	**268,642**	**-**	**367,384**	**29,391**	**352,938**	**343,893**	**331,107**	**318,101**
Trading - related											
Repo-style transactions	987,066	1%	18	8,557	93	8,668	693	8,294	9,112	8,882	9,537
Derivatives - including CVA	137,865	29%	2,284	21,566	16,288	40,138	3,211	39,086	42,244	37,957	42,377
Total trading-related	**1,124,931**	**4%**	**2,302**	**30,123**	**16,381**	**48,806**	**3,904**	**47,380**	**51,356**	**46,839**	**51,914**
Total lending-related and other and trading-related	**2,719,323**	**15%**	**101,044**	**298,765**	**16,381**	**416,190**	**33,295**	**400,318**	**395,249**	**377,946**	**370,015**
Banking book equities [6]	4,346	131%	-	5,682	-	5,682	455	5,667	5,645	5,682	5,474
Securitization exposures	74,839	17%	5,912	6,631	-	12,543	1,004	11,897	11,706	10,724	10,328
Regulatory scaling factor [7]	n.a.	n.a.	n.a.	18,267	n.a.	18,267	1,461	17,961	17,768	16,959	16,485
Other assets	31,620	140%	n.a.	n.a.	44,216	44,216	3,537	42,843	42,148	41,386	41,840
Total credit risk	**2,830,128**	**18%**	**106,956**	**329,345**	**60,597**	**496,898**	**39,752**	**478,686**	**472,516**	**452,697**	**444,142**
Market risk[8,9]											
Interest rate			2,321	10,935	-	13,256	1,060	12,034	14,127	19,176	14,380
Equity			2,538	1,463	-	4,001	320	4,292	4,840	4,669	4,178
Foreign exchange			3,394	341	-	3,735	299	2,996	3,904	4,155	3,083
Commodities			1,630	120	-	1,750	140	2,627	1,791	1,136	762
Specific risk			7,370	1,041	-	8,411	673	8,110	8,758	8,376	7,601
Incremental risk charge[10, 11]			-	4,189	-	4,189	335	4,492	4,431	4,300	4,802
Total market risk			**17,253**	**18,089**	**-**	**35,342**	**2,827**	**34,551**	**37,851**	**41,812**	**34,806**
Operational risk			**77,639**	**-**	**n.a.**	**77,639**	**6,211**	**75,813**	**75,472**	**74,776**	**73,593**
Total risk-weighted assets (RWA)	**2,830,128**		**201,848**	**347,434**	**60,597**	**609,879**	**48,790**	**589,050**	**585,839**	**569,285**	**552,541**

[1] Calculated using guidelines issued by OSFI under the Basel III All-in framework.

[2] Total exposure represents exposure at default (EAD) which is the expected gross exposure upon the default of an obligor. This amount excludes any allowance against impaired loans or partial write-offs and does not reflect the impact of credit risk mitigation. Exposures acquired through the Federal Reserve Paycheck Protection Program lending facility have been excluded, as required by OSFI.

[3] Represents the average of counterparty risk weights within a particular category.

[4] The minimum capital requirements for each category can be calculated by multiplying the total RWA by 8% as per OSFI CAR guidelines.

[5] For credit risk, a majority of our portfolios use the Internal Ratings Based (IRB) Approach and the remainder use the Standardized Approach.

[6] CAR guidelines define banking book equities based on the economic substance of the transaction rather than the legal form or accounting treatment associated with the financial instrument. As such, differences exist in the identification of equity securities held in the banking book and those reported in the financial statements. Banking book equities are financial instruments held for investment purposes and are not part of our trading book, consisting of publicly-traded and private equities, partnership units, venture capital and derivative instruments tied to equity interests.
As at Q4/22, the amount of publicly-traded equity exposures was $1,807 million and private equity exposures amounted to $2,539 million. Total exposure represents EAD, which is the expected gross exposure upon the default of an obligor.
Under OSFI guidelines, the Simple Risk Weight method under the Market-based Approach is being used to calculate RWA for direct equity exposures ($2,416 million). The calculation of RWA for Equity Investments in Funds ($3,266 million) uses the Mandate-based and Fall-Back Approaches.

[7] The scaling factor represents a calibration adjustment of 6% as prescribed by OSFI under the Basel III framework and is applied to RWA amounts for credit risk assessed under the IRB Approach.

[8] For market risk RWA measurement, we use an internal models approach where we have obtained regulatory approval, and a standardized approach for products yet to be approved. For standardized approach, we use internally validated models.

[9] Regulatory capital for our correlation trading portfolios is determined through the standardized approach as prescribed by OSFI. Therefore, we do not have a Comprehensive Risk Charge for these portfolios. Our securitization and resecuritization positions in our trading book also have capital requirements under the standardized approach. The changes in value due to market and credit risk in the securitization and resecuritization in the trading book are managed through the daily mark-to-market process. Furthermore, we employ market risk measures such as sensitivities to changes in option-adjusted spreads and underlying asset prices as well as value-at-risk (VaR) and stress testing measures.

[10] The incremental risk charge (IRC) was $327 million as at Q4/22. The average was $340 million, high was $468 million and low was $279 million for Q4/22. The IRC is measured over a one-year horizon at a 99.9% confidence level. We utilize a technique known as the Monte Carlo simulation process to generate a statistically relevant number of loss scenarios due to ratings migration and default in order to establish the losses at that confidence level. We also make certain assumptions about position liquidity (the length of time to close out a position) within the model that range from a floor of three months to maximum of one year. The determination of liquidity is based on issuer type and credit rating. Credit rating migration and default probabilities (PD) are based on historical data.

[11] The models are subject to the same internal independent vetting and validation procedures used for all regulatory capital models. Important assumptions are re-reviewed at least annually. Due to the long time horizon and high confidence level of the risk measure, we do not perform back-testing as we do for the VaR measure.

[12] Home equity line of credit (HELOC) exposures under the IRB Approach reported as “Other Retail” in this table in prior quarters have now been grouped with Residential Mortgages to ensure consistent classification between Standardized Approach and IRB Approach. Prior quarter periods have been updated to the new format.

LINKAGES BETWEEN FINANCIAL STATEMENTS AND REGULATORY EXPOSURES

LI1: Differences between accounting and regulatory scopes of consolidation and mapping of financial statement categories with regulatory risk categories

The following table provides the differences between carrying values presented in our financial statements prepared in accordance with International Financial Reporting Standards (IFRS) and our regulatory exposures. It further breaks down the amounts in our financial statements into regulatory risk categories.

As at October 31, 2022

	a	b	c	d	e	f	g
			Carrying values of items:[1]				
(Millions of Canadian dollars)	Carrying values as reported in published financial statements	Carrying values under scope of regulatory consolidation	Subject to credit risk framework	Subject to counterparty credit risk framework	Subject to the securitization framework	Subject to the market risk framework	Not subject to capital requirements or subject to deduction from capital
Assets							
Cash and due from banks	72,397	72,397	72,346	-	-	-	51
Interest-bearing deposits with banks	108,011	108,011	108,011	-	-	-	-
Securities							
Trading	148,205	137,293	6,123	-	61	131,007	103
Investment, net of applicable allowance	170,018	166,816	154,796	-	12,041	-	(22)
	318,223	304,109	160,919	-	12,102	131,007	81
Assets purchased under reverse repurchase agreements and securities borrowed	317,845	317,845	-	317,846	-	-	(1)
Loans							
Retail	549,751	549,261	549,261	-	-	-	-
Wholesale[3]	273,967	271,826	253,417	2,587	9,829	3,547	2,446
	823,718	821,087	802,678	2,587	9,829	3,547	2,446
Allowance for loan losses	(3,753)	(3,753)	-	-	-	-	(3,753)
	819,965	817,334	802,678	2,587	9,829	3,547	(1,307)
Segregated fund net assets	2,638	-	-	-	-	-	-
Other							
Customers' liability under acceptances	17,827	17,827	17,872	-	-	-	(45)
Derivatives[2]	154,439	154,001	-	154,001	-	142,616	-
Premises and equipment, net	7,214	7,198	7,198	-	-	-	-
Goodwill	12,277	12,277	-	-	-	-	12,277
Other intangibles	6,083	5,946	-	-	-	-	5,946
Other assets	80,300	83,763	32,197	38,951	-	8,949	3,666
	278,140	281,012	57,267	192,952	-	151,565	21,844
Total assets[2]	**1,917,219**	**1,900,708**	**1,201,221**	**513,385**	**21,931**	**286,119**	**20,668**
Liabilities and equity							
Deposits							
Personal	404,932	404,932	-	-	-	-	404,932
Business and government	759,870	760,464	-	-	-	-	760,464
Bank	44,012	44,012	-	-	-	-	44,012
	1,208,814	1,209,408	-	-	-	-	1,209,408
Segregated fund net liabilities	2,638	-	-	-	-	-	-
Other							
Acceptances	17,872	17,872	-	-	-	-	17,872
Obligations related to securities sold short	35,511	35,511	-	-	-	-	35,511
Obligations related to assets sold under repurchase agreements and securities loaned	273,947	273,823	-	273,823	-	-	-
Derivatives[2]	153,491	153,491	-	153,491	-	144,754	-
Insurance claims and policy benefit liabilities	11,511	-	-	-	-	-	-
Other liabilities	95,235	91,759	-	-	-	-	91,759
	587,567	572,456	-	427,314	-	144,754	145,142
Subordinated debentures	10,025	10,025	-	-	-	-	10,025
Total liabilities[2]	1,809,044	1,791,889	-	427,314	-	144,754	1,364,575
Equity attributable to shareholders							
Preferred shares	7,318	7,318	-	-	-	-	7,318
Common shares	16,984	16,984	-	-	-	-	16,984
Retained earnings	78,037	77,988	-	-	-	-	77,988
Other components of equity	5,725	6,418	-	-	-	-	6,418
	108,064	108,708	-	-	-	-	108,708
Non-controlling interests	111	111	-	-	-	-	111
Total equity	108,175	108,819	-	-	-	-	108,819
Total liabilities and equity[2]	**1,917,219**	**1,900,708**	**-**	**427,314**	**-**	**144,754**	**1,473,394**

[1] Column c to g reflect a further breakout of column b by providing the respective CAR guideline frameworks utilized and OSFI COVID-19 guidance.

[2] Derivative assets and liabilities are subject to both counterparty credit risk and market risk framework – hence column b will not equal to the sum of column c to g.

[3] Amount includes exposure related to the US Government Paycheck Protection Program which are excluded from risk-weighting as per OSFI COVID-19 guidance.

LI2: Main sources of differences between regulatory exposure amounts and carrying values in financial statements

The following table provides the key differences between the exposure amounts for regulatory purposes and the accounting carrying values as presented in our financial statements that are within the scope of regulatory consolidation.

As at October 31, 2022

		a	b	c	d	e
			Items subject to:			
	(Millions of Canadian dollars)	Total	Credit risk framework	Securitization framework	Counterparty credit risk framework	Market risk framework
1	**Asset carrying value amount under scope of regulatory consolidation (as per template LI1)[1]**	**1,880,040**	**1,201,221**	**21,931**	**513,385**	**286,119**
2	Liabilities carrying value amount under regulatory scope of consolidation (as per template LI1)[1]	427,314	-	-	427,314	144,754
3	Total net amount under regulatory scope of consolidation	1,452,726	1,201,221	21,931	86,071	141,365
4	Off-balance sheet amounts[2]	1,512,513	420,915	52,908	1,038,690	-
5	Differences due to Fair Value adjustment	5,282	5,112	-	170	-
6	Differences due to different netting rules, other than those already included in row 2	1,743	1,743	-	-	-
7	Differences due to consideration of provisions	-	-	-	-	-
8	Differences due to prudential filters	-	-	-	-	-
9	Difference due to accounting and risk treatment of securitizations and other items	1,367	1,367	-	-	-
10	**Exposure amounts considered for regulatory purposes**	**2,973,631**	**1,630,358**	**74,839**	**1,124,931**	**141,365**

[1] Amount reflects Table LI1 columns (c), (d), (e) and (f) from the previous page. Derivative assets and liabilities are subject to both counterparty credit risk and market risk framework – hence column a will not equal to the sum of column b to e.

[2] Off-balance sheet amounts reflect the application of credit conversion factors.

LIA: Explanations of differences between accounting and regulatory exposure amounts

Our consolidated balance sheet ("accounting balance sheet") is prepared in compliance with IFRS as issued by the International Accounting Standards Board. We leverage our accounting balance sheet to apply the required regulatory requirements prescribed by OSFI to determine our regulatory capital consolidated balance sheet.

In Template LI1: Differences between accounting and regulatory scopes of consolidation and mapping of financial statement categories with regulatory risk categories, we identify the differences between our IFRS consolidated accounting balance sheet (column a in LI1) and our regulatory capital consolidated balance sheet (column b in LI1). Our regulatory capital consolidated balance sheet, on which capital adequacy requirements are determined, reflects all of our consolidated subsidiaries except for our insurance subsidiaries as prescribed by OSFI's CAR guidelines.

In Template LI2: Main sources of differences between regulatory exposure amounts and carrying values in financial statements, we quantify measurement differences other than regulatory consolidation.

Our banking book regulatory carrying values reflect our IFRS accounting balance sheet values except for our fair valued loans and debt securities carried at fair value through other comprehensive income (FVOCI), which under the Credit risk framework, are measured at amortized cost. Off-balance sheet regulatory asset values reflect prescribed conversion factors and undrawn amounts.

Regulatory carrying values for our Counterparty credit risk related to our derivative assets and liabilities, assets purchased under reverse repurchase agreements and securities borrowed and obligations related to assets sold under repurchase agreements and securities loaned are determined using OSFI's CAR guidelines Chapter 4 Settlement and Counterparty risk framework. On November 1, 2018, OSFI adopted the BCBS Standardized Approach for measuring Counterparty credit risk for derivative regulatory exposures and we have adopted this methodology for our derivative regulatory exposures. The main differences between the accounting and regulatory amounts for Counterparty credit risk relate to regulatory inclusion of potential future exposure amounts and differences in allowed IFRS and regulatory netting rules, and also application of financial collateral in the calculation of regulatory exposure amount.

The regulatory carrying value of exposures subject to the securitization framework includes our on-balance sheet third party securitization holdings as well as our securitized credit card exposures which meet the risk transference requirements under the CAR guidelines Chapter 7 but are not considered securitized for the purposes of our IFRS accounting balance sheet. Our regulatory carrying values are determined based on the BCBS revised securitization framework adopted by OSFI on November 1, 2018.

Our trading book regulatory carrying values are determined as prescribed under the CAR guidelines Chapter 9. We employ OSFI's prudent valuation guidance requirements, as stated in CAR Chapter 9 section 9.8 to our trading book. Refer to our 2022 Annual Report - Risk Management section which provides further insight into how we measure our market risk and the linkage of market risk to selected balance sheet items.

CAPITAL

CC1: Composition of Capital

The following table provides details of our regulatory capital and required regulatory adjustments under OSFI's CAR guidelines. Reconciliation references to CC2 of where these items are located on our IFRS and regulatory balance sheet are also included.

	Composition of Capital Template (Millions of Canadian dollars, except percentage and otherwise noted)	Cross Reference of Current Quarter to Regulatory Capital Balance Sheet (CC2)	Q4/22	Q3/22	Q2/22	Q1/22	Q4/21
Common Equity Tier 1 capital (CET1): Instruments and Reserves							
1	Directly issued qualifying common share capital (and equivalent for non-joint stock companies) plus related stock surplus	a+a'	17,162	17,327	17,554	17,817	17,887
2	Retained earnings	b+b'	77,859	76,230	75,691	73,297	71,563
3	Accumulated other comprehensive income (and other reserves)	c-c'	5,725	3,011	3,761	3,355	2,533
4	*Directly issued capital subject to phase out from CET1 (only applicable to non-joint stock companies)*		-	-	-	-	-
5	Common share capital issued by subsidiaries and held by third parties (amount allowed in group CET1)	d	11	10	10	10	11
6	**Common Equity Tier 1 capital before regulatory adjustments**		**100,757**	**96,578**	**97,016**	**94,479**	**91,994**
	Common Equity Tier 1 capital: Regulatory adjustments						
7	Prudential valuation adjustments		-	-	-	-	-
8	Goodwill (net of related tax liability)	e+e'-t	12,135	10,806	10,853	10,884	10,734
9	Other intangibles other than mortgage-servicing rights (net of related tax liability)	f+f'-v	4,887	3,566	3,579	3,649	3,656
10	Deferred tax assets excluding those arising from temporary differences (net of related tax liability)	g	278	232	228	227	222
11	Cash flow hedge reserve	h	2,394	1,431	1,681	695	566
12	Shortfall of provisions to expected losses	i	-	-	-	-	-
13	Securitization gain on sale		-	-	-	-	-
14	Gains and losses due to changes in own credit risk on fair valued liabilities	j	1,893	1,371	1,009	(33)	(258)
15	Defined benefit pension fund net assets (net of related tax liability)	k-u	2,395	2,399	2,701	2,171	1,909
16	Investments in own shares (if not already netted off paid-in capital on reported balance sheet)		-	-	-	-	-
17	Reciprocal cross holdings in common equity		-	-	-	-	-
18	Non-significant investments in the capital of banking, financial and insurance entities, net of eligible short positions (amount above 10% threshold)		-	-	-	-	-
19	Significant investments in the common stock of banking, financial and insurance entities that are outside the scope of regulatory consolidation, net of eligible short positions (amount above 10% threshold)		-	-	-	-	-
20	Mortgage servicing rights (amount above 10% threshold)		-	-	-	-	-
21	Deferred tax assets arising from temporary differences (amount above 10% threshold, net of related tax liability)		-	-	-	-	-
22	Amount exceeding the 15% threshold		-	-	-	-	-
23	of which: significant investments in the common stock of financials	l	-	-	-	-	-
24	of which: mortgage servicing rights		-	-	-	-	-
25	of which: deferred tax assets arising from temporary differences	m	-	-	-	-	-
26	Other deductions or regulatory adjustments to CET1 as determined by OSFI		(170)	(134)	(104)	(194)	(418)
27	Regulatory adjustments applied to Common Equity Tier 1 due to insufficient Additional Tier 1 and Tier 2 to cover deductions		-	-	-	-	-
28	**Total regulatory adjustments to Common Equity Tier 1**		23,812	19,671	19,947	17,399	16,411
29	**Common Equity Tier 1 capital (CET1)**		**76,945**	**76,907**	**77,069**	**77,080**	**75,583**
29a	**Common Equity Tier 1 Capital (CET1)** with transitional arrangements for ECL provisioning not applied		76,774	76,773	76,966	76,885	75,163
Additional Tier 1 capital (AT1): Instruments							
30	Directly issued qualifying Additional Tier 1 instruments plus related stock surplus		7,294	7,297	7,274	7,411	6,661
31	of which: classified as equity under applicable accounting standards	n'+n'''+n''''	7,294	7,297	7,274	7,411	6,661
32	of which: classified as liabilities under applicable accounting standards		-	-	-	-	-

	Composition of Capital Template *continued* (Millions of Canadian dollars, except percentage and otherwise noted)	**Cross Reference of Current Quarter to Regulatory Capital Balance Sheet (CC2)**	**Q4/22**	**Q3/22**	**Q2/22**	**Q1/22**	**Q4/21**
33	*Directly issued capital instruments subject to phase out from Additional Tier 1*	x'+n"	-	-	-	-	-
34	Additional Tier 1 instruments (and CET1 instruments not included in row 5) issued by subsidiaries and held by third parties (amount allowed in group AT1)		3	3	2	2	2
35	*of which: instruments issued by subsidiaries subject to phase out*		-	-	-	-	-
36	**Additional Tier 1 capital before regulatory adjustments**		7,297	7,300	7,276	7,413	6,663
	Additional Tier 1 capital: Regulatory adjustments						
37	Investments in own Additional Tier 1 instruments		-	-	-	-	-
38	Reciprocal cross holdings in Additional Tier 1 instruments		-	-	-	-	-
39	Non-significant investments in the capital of banking, financial and insurance entities, net of eligible short positions (amount above 10% threshold)		-	-	-	-	-
40	Significant investments in the capital of banking, financial and insurance entities that are outside the scope of regulatory consolidation, net of eligible short positions		-	-	-	-	-
41	Other deductions from Tier 1 capital as determined by OSFI		-	-	-	-	-
41a	of which: reverse mortgages		-	-	-	-	-
42	Regulatory adjustments applied to Additional Tier 1 due to insufficient Tier 2 to cover deductions		-	-	-	-	-
43	**Total regulatory adjustments to Additional Tier 1 capital**		-	-	-	-	-
44	**Additional Tier 1 Capital (AT1)**		**7,297**	**7,300**	**7,276**	**7,413**	**6,663**
45	**Tier 1 capital (T1 = CET1 + AT1)**		**84,242**	**84,207**	**84,345**	**84,493**	**82,246**
45a	**Tier 1 capital** with transitional arrangements for ECL provisioning not applied		84,071	84,073	84,242	84,298	81,826
Tier 2 Capital: Instruments and Provisions							
46	Directly issued qualifying Tier 2 instruments plus related stock surplus	q" + q""'	8,587	8,741	8,710	9,009	8,443
47	*Directly issued capital instruments subject to phase out from Tier 2*	q"'	-	-	-	-	448
48	Tier 2 instruments (and CET1 and AT1 instruments not included in rows 5 or 34) issued by subsidiaries and held by third parties (amount allowed in group Tier 2)	r + q""	3	3	3	3	26
49	*of which: instruments issued by subsidiaries subject to phase out*	q""	-	-	-	-	*23*
50	Collective allowances	s	1,018	906	813	997	863
51	**Tier 2 capital before regulatory adjustments**		**9,608**	**9,650**	**9,526**	**10,009**	**9,780**
	Tier 2 Capital: Regulatory adjustments						
52	Investments in own Tier 2 instruments		-	-	-	-	-
53	Reciprocal cross holdings in Tier 2 instruments and Other TLAC-eligible Instruments		-	-	-	-	-
54	Non-significant investments in the capital of banking, financial and insurance entities, and Other TLAC-eligible instruments issued by G-SIBs and Canadian D-SIBs that are outside the scope of regulatory consolidation, where the institution does not own more than 10% of the issued common share capital of the entity (amount above 10% threshold)		-	-	-	-	-
54a	Non-significant investments in the other TLAC-eligible instruments issued by G-SIBs and Canadian D-SIBs, where the institution does not own more than 10% of the issued common share capital of the entity: amount previously designated for the 5% threshold but that no longer meets the conditions		-	-	-	-	-
55	Significant investments in the capital of banking, financial and insurance entities and Other TLAC-eligible instuments issued by G-SIBs and Canadian D-SIBs that are outside the scope of regulatory consolidation		-	-	-	-	-
56	Other deductions from Tier 2 capital		-	-	-	-	-
57	**Total regulatory adjustments to Tier 2 capital**		-	-	-	-	-
58	**Tier 2 capital (T2)**		**9,608**	**9,650**	**9,526**	**10,009**	**9,780**
59	**Total capital (TC = T1 + T2)**		**93,850**	**93,857**	**93,871**	**94,502**	**92,026**
59a	**Total Capital** with transitional arrangements for ECL provisioning not applied		93,850	93,857	93,871	94,502	92,026
60	**Total risk-weighted assets**		**609,879**	**589,050**	**585,839**	**569,285**	**552,541**
60a	**Common Equity Tier 1 (CET1) Capital RWA**		**609,879**	**589,050**	**585,839**	**569,285**	**552,541**
60b	**Tier 1 Capital RWA**		**609,879**	**589,050**	**585,839**	**569,285**	**552,541**
60c	**Total Capital RWA**		**609,879**	**589,050**	**585,839**	**569,285**	**552,541**

Composition of Capital Template *continued* (Millions of Canadian dollars, except percentage and otherwise noted)		Cross Reference of Current Quarter to Regulatory Capital Balance Sheet (CC2)	Q4/22	Q3/22	Q2/22	Q1/22	Q4/21
Capital ratios							
61	Common Equity Tier 1 (as a percentage of risk-weighted assets)		12.6%	13.1%	13.2%	13.5%	13.7%
61a	CET1 Ratio with transitional arrangements for ECL provisioning not applied		12.6%	13.0%	13.1%	13.5%	13.6%
62	Tier 1 (as a percentage of risk-weighted assets)		13.8%	14.3%	14.4%	14.8%	14.9%
62a	Tier 1 Capital Ratio with transitional arrangements for ECL provisioning not applied		13.8%	14.3%	14.4%	14.8%	14.8%
63	Total capital (as a percentage of risk-weighted assets)		15.4%	15.9%	16.0%	16.6%	16.7%
63a	Total Capital Ratio with transitional arrangements for ECL provisioning not applied		15.4%	15.9%	16.0%	16.6%	16.7%
64	Buffer (minimum CET1 requirement plus capital conservation buffer plus G-SIB buffer requirement plus D-SIB buffer expressed as a percentage of risk-weighted assets)		8.0%	8.0%	8.0%	8.0%	8.0%
65	of which: capital conservation buffer		2.5%	2.5%	2.5%	2.5%	2.5%
66	of which: bank-specific countercyclical buffer		0.0%	0.0%	0.0%	0.0%	0.0%
67	of which: G-SIB buffer[1]		1.0%	1.0%	1.0%	1.0%	1.0%
67a	of which: D-SIB buffer		0.0%	0.0%	0.0%	0.0%	0.0%
68	Common Equity Tier 1 available to meet buffers (as a percentage of risk-weighted assets)		12.6%	13.1%	13.2%	13.5%	13.7%
OSFI target (minimum + capital conservation buffer + D-SIB surcharge (if applicable))							
69	Common Equity Tier 1 target ratio		8.0%	8.0%	8.0%	8.0%	8.0%
70	Tier 1 capital target ratio		9.5%	9.5%	9.5%	9.5%	9.5%
71	Total capital target ratio		11.5%	11.5%	11.5%	11.5%	11.5%
Amounts below the thresholds for deduction (before risk-weighting)							
72	Non-significant investments in the capital and Other TLAC-eligible instruments of other financials entities		600	769	1,324	958	761
73	Significant investments in the common stock of financials		6,533	5,960	6,112	5,980	5,799
74	Mortgage servicing rights (net of related tax liability)		-	-	-	-	-
75	Deferred tax assets arising from temporary differences (net of related tax liability)		1,523	1,622	1,514	1,506	1,515
Applicable caps on the inclusion of allowances in Tier 2							
76	Allowances eligible for inclusion in Tier 2 in respect of exposures subject to standardized approach (prior to application of cap)		874	781	737	849	861
77	Cap on inclusion of allowances in Tier 2 under standardized approach		874	781	737	849	861
78	Allowances eligible for inclusion in Tier 2 in respect of exposures subject to internal ratings-based approach (prior to application of cap)		2,693	2,609	2,485	2,882	2,925
79	Cap on inclusion of allowances in Tier 2 under internal ratings-based approach		2,693	2,609	2,485	2,882	2,925
Capital instruments subject to phase-out arrangements (only applicable between 1 Jan 2013 and 1 Jan 2022)							
80	*Current cap on CET1 instruments subject to phase out arrangements*		-	-	-	-	-
81	*Amounts excluded from CET1 due to cap (excess over cap after redemptions and maturities)*		-	-	-	-	-
82	*Current cap on AT1 instruments subject to phase out arrangements*		-	-	-	-	739
83	*Amounts excluded from AT1 due to cap (excess over cap after redemptions and maturities)*		-	-	-	-	-
84	*Current cap on T2 instruments subject to phase out arrangements*		-	-	-	-	919
85	*Amounts excluded from T2 due to cap (excess over cap after redemptions and maturities)*		580	565	565	562	-

[1] Capital surcharge, equal to the higher of our D-SIB surcharge and the BCBS's G-SIB surcharge, is applicable to risk-weighted capital.

CC2: Regulatory capital balance sheet

The following table provides a reconciliation of our regulatory capital elements as reported in CC1 with our balance sheet prepared in accordance with IFRS and our regulatory balance sheet.

Regulatory capital balance sheet (Millions of Canadian dollars)	Cross Reference to Basel III Regulatory Capital Components (CC1)	Q4/22 Balance sheet as in Report to Shareholders	Q4/22 Under regulatory scope of consolidation
Assets			
Cash and due from banks		72,397	72,397
Interest-bearing deposits with banks		108,011	108,011
Securities, net of applicable allowance		318,223	304,109
Non-significant investments in capital of other financial institutions not exceeding regulatory thresholds			600
Other securities			303,509
Assets purchased under reverse repurchase agreements and securities borrowed		317,845	317,845
Loans			-
Retail		549,751	549,261
Wholesale		273,967	271,826
Allowance for loan losses		(3,753)	(3,753)
Collective allowance reflected in Tier 2 regulatory capital [1]	**s**		(1,018)
Shortfall of allowances to expected loss [2]	**i**		-
Allowances not reflected in regulatory capital			(2,735)
		819,965	817,334
Segregated fund net assets		2,638	-
Other			
Customers' liability under acceptances		17,827	17,827
Derivatives		154,439	154,001
Premises and equipment, net		7,214	7,198
Goodwill	**e**	12,277	12,277
Goodwill related to insurance and joint ventures	**e'**		-
Other intangibles	**f**	6,083	5,946
Other intangibles related to insurance and joint ventures	**f'**		137
Other		80,300	83,763
Significant investments in other financial institutions and insurance subsidiaries			6,533
of which: exceeding regulatory thresholds	**l**		-
of which: not exceeding regulatory thresholds			6,533
Defined - benefit pension fund net assets	**k**		3,238
Deferred tax assets			1,425
of which: deferred tax assets excluding those arising from temporary differences	**g**		278
of which: deferred tax assets arising from temporary differences exceeding regulatory thresholds	**m**		-
of which: deferred tax liabilities related to permitted tax netting			(1,743)
of which: deferred tax assets - other temporary differences			2,890
Other assets			72,567
of which: relates to assets of operations held for sale – Goodwill			-
Total assets		**1,917,219**	**1,900,708**

[1] Collective allowance includes Stage 1 and Stage 2 ACL on financial assets.

[2] Expected loss as defined under the Basel III framework.

Regulatory capital balance sheet ***continued*** (Millions of Canadian dollars)	**Cross Reference to Basel III Regulatory Capital Components (CC1)**	**Q4/22**	
		Balance sheet as in Report to Shareholders	**Under regulatory scope of consolidation**
Liabilities			
Deposits			
Personal		404,932	404,932
Business and government		759,870	760,464
Bank		44,012	44,012
		1,208,814	1,209,408
Segregated fund net liabilities		2,638	-
Other			
Acceptances		17,872	17,872
Obligations related to securities sold short		35,511	35,511
Obligations related to assets sold under repurchase agreements and securities loaned		273,947	273,823
Derivatives		153,491	153,491
Insurance claims and policy benefit liabilities		11,511	-
Other liabilities		95,235	91,759
Gains and losses due to changes in own credit risk on fair value liabilities	**j**		1,893
Deferred tax liabilities			439
of which: related to goodwill	**t**		142
of which: related to intangibles	**v**		1,196
of which: related to pensions	**u**		843
of which: relates to permitted tax netting			(1,742)
of which: other deferred tax liabilities			-
Other Liabilities			89,427
Subordinated debentures	**q**	10,025	10,025
Regulatory capital amortization of maturing debentures	**q'''''**		(818)
Subordinated debentures not allowed for regulatory capital	**q'**		1,438
Subordinated debentures used for regulatory capital:			9,405
of which: are qualifying	**q''**		9,405
of which: are subject to phase out directly issued capital:	**q'''**		-
of which: are subject to phase out issued by subsidiaries and held by 3rd party	**q''''**		-
Total liabilities		**1,809,044**	**1,791,889**
Equity attributable to shareholders		**108,064**	**108,708**
Common shares	**a**	16,984	16,984
of which are treasury - common shares			(334)
Retained earnings		78,037	77,988
of which relates to contributed surplus	**a'**		178
of which relates to retained earnings for capital purposes	**b**		77,810
of which relates to insurance and joint ventures	**b'**		49
Other components of equity	**c**	5,725	6,418
Gains and losses on derivatives designated as cash flow hedges	**h**		2,394
Unrealized foreign currency translation gains and losses, net of hedging activities			5,688
Other reserves allowed for regulatory capital			(1,664)
of which relates to Insurance	**c'**		693
Preferred shares and other equity instruments	**n**	7,318	7,318
of which: are qualifying	**n'**		7,301
of which: are subject to phase out	**n''**		-
of which portion are not allowed for regulatory capital			23
of which: are qualifying treasury - preferred shares	**n'''**		(1)
of which: are qualifying treasury - other	**n''''**		(5)
of which: are subject to phase out treasury - preferred shares			-

Regulatory capital balance sheet *continued* (Millions of Canadian dollars)	Cross Reference to Basel III Regulatory Capital Components (CC1)	Q4/22 Balance sheet as in Report to Shareholders	Under regulatory scope of consolidation
Non-controlling interests		**111**	**111**
of which: are qualifying			
portion allowed for inclusion into CET1	**d**		11
portion allowed for inclusion into Tier 1 capital	**o**		3
portion allowed for inclusion into Tier 2 capital	**r**		3
of which: are subject to phase out	**x'**		-
of which: portion not allowed for regulatory capital			94
Total equity		**108,175**	**108,819**
Total liabilities and equity		**1,917,219**	**1,900,708**

Insurance subsidiaries [1]	Principal activities	Equity	Assets
Assured Assistance Inc.	Service provider for insurance claims	2	-
Royal Bank of Canada Insurance Company Limited	Life, annuity, trade credit, title and property reinsurance company provides coverage to international clients	2,027	1,325
RBC (Barbados) Services Company Ltd	Investment management, reinsurance transaction support and corporate services to Royal Bank of Canada Insurance Company Ltd.	1	-
RBC Insurance Agency Ltd.	Distribution of H&A products through AVIVA	52	52
RBC Insurance Company (Cayman) Limited	Life, annuity reinsurance company provides coverage to international clients	5	-
RBC Insurance Company of Canada	Property and casualty insurance company	117	124
RBC Insurance Holdings Inc.	Holding company	1	-
RBC Insurance Services Inc.	Service provider for insurance companies listed and the bank (creditor)	70	88
RBC Life Insurance Company	Life and health insurance company	3,420	20,617
		5,695	22,206

[1] The list of legal entities that are included within the accounting scope of consolidation but excluded from the regulatory scope of consolidation.

CREDIT RISK

CRA: General qualitative information about credit risk

The table below presents an overview of Pillar 3 disclosure requirements that have been met within our 2022 Annual Report and incorporated by reference into this Pillar 3 report. Our 2022 Annual Report is available free of charge on our website at http://www.rbc.com/investorrelations

Pillar 3 disclosures requirement		2022 Annual Report section	Sub-section
a)	Translation of the business model into the components of the bank's credit risk profile	Credit risk	Overview
			Measurement of economic and regulatory capital - *Gross credit risk exposure*
b)	Criteria and approach used for defining credit risk management policy and for setting credit risk limits	Enterprise risk management	Risk governance
			Risk appetite
			Risk measurement
			Risk control – *Delegated risk approval authorities and risk limits*
		Credit risk	Overview
			Credit risk assessment
			Credit risk mitigation
			Credit risk approval
c)	Structure and organization of the credit risk management and control function	Enterprise risk management	Risk governance
			Risk control
d)	Interaction between the credit risk management, risk control, compliance and internal audit functions	Enterprise risk management	Risk governance
e)	Scope and content of the reporting on credit risk exposure to the executive management and to the board of directors	Enterprise risk management	Risk governance
			Risk control – *Risk monitoring and reporting*

CR1: Credit quality of assets

The following table presents a comprehensive view of the credit quality of our on- and off-balance sheet assets.

As at October 31, 2022

		a	b	c	d	e	f	g
		Gross carrying values of		Allowances/ impairments[2]	Of which ECL accounting provisions on SA exposures		Of which ECL accounting provisions on IRB exposures	Net values (a+b-c)
	(Millions of Canadian dollars)	Defaulted exposures[1]	Non-defaulted exposures		Allocated in regulatory category of Specific[3]	Allocated in regulatory category of General[3]		
1	Loans	2,183	800,495	3,753	105	272	3,376	798,925
2	Debt Securities	-	158,391	22	-	-	22	158,369
3	Off-Balance Sheet exposures[4]	854	315,821	403	-	-	403	316,272
4	**Total**	**3,037**	**1,274,707**	**4,178**	**105**	**272**	**3,801**	**1,273,566**

[1] Definition of default as per the CAR guidelines and recent OSFI COVID-19 guidance.

[2] Reflects Stage 1, 2 and 3 allowances under IFRS 9, excluding ACL on fair value through OCI on financial instruments.

[3] Regulatory category of specific allowance reflects IFRS 9 Stage 3 allowances. Regulatory category of general allowances reflects Stage 1 & 2 allowances.

[4] Off balance sheet amounts are before the application of credit conversion factors and reflect guarantees given and irrevocable loan commitments. Revocable loan commitments are excluded as per BCBS requirements.

As at July 31, 2022

		a	b	c	d	e	f	g
		Gross carrying values of		Allowances/ impairments[2]	Of which ECL accounting provisions on SA exposures		Of which ECL accounting provisions on IRB exposures	Net values (a+b-c)
	(Millions of Canadian dollars)	Defaulted exposures[1]	Non-defaulted exposures		Allocated in regulatory category of Specific[3]	Allocated in regulatory category of General[3]		
1	Loans	1,958	776,189	3,667	122	221	3,324	774,480
2	Debt Securities	-	144,712	22	-	-	22	144,690
3	Off-Balance Sheet exposures[4]	772	302,578	334	-	-	334	303,016
4	**Total**	**2,730**	**1,223,479**	**4,023**	**122**	**221**	**3,680**	**1,222,186**

[1] Definition of default as per the CAR guidelines and recent OSFI COVID-19 guidance.

[2] Reflects Stage 1, 2 and 3 allowances under IFRS 9, excluding ACL on fair value through OCI on financial instruments.

[3] Regulatory category of specific allowance reflects IFRS 9 Stage 3 allowances. Regulatory category of general allowances reflects Stage 1 & 2 allowances.

[4] Off balance sheet amounts are before the application of credit conversion factors and reflect guarantees given and irrevocable loan commitments. Revocable loan commitments are excluded as per BCBS requirements.

CR2: Changes in stock of defaulted loans and debt securities

The following table presents our defaulted exposure balances, the flows between non-defaulted and defaulted exposure categories and reductions in the defaulted exposure balances due to write-offs.

For the six months ended October 31, 2022

	(Millions of Canadian dollars)	a
1	**Defaulted loans and debt securities at the end of April 30, 2022**	**2,066**
2	Loans and debt securities that have defaulted since the last reporting period	579
3	Returned to non-defaulted status	(72)
4	Amounts written off	(652)
5	Other changes	262
6	**Defaulted loans and debt securities at the end of October 31, 2022**	**2,183**

For the six months ended April 30, 2022

	(Millions of Canadian dollars)	a
1	**Defaulted loans and debt securities at the end of October 31, 2021**	**2,209**
2	Loans and debt securities that have defaulted since the last reporting period	723
3	Returned to non-defaulted status	(172)
4	Amounts written off	(497)
5	Other changes	(197)
6	**Defaulted loans and debt securities at the end of April 30, 2022**	**2,066**

CRB: Additional disclosure related to the credit quality of assets

The table below presents an overview of Pillar 3 disclosure requirements that have been met within our 2022 Annual Report and incorporated by reference into this Pillar 3 report. Our 2022 Annual Report is available free of charge on our website at http://www.rbc.com/investorrelations

Pillar 3 disclosures requirement		2022 Annual Report section	Sub-section
a)	Definitions of past due and impaired exposures	Consolidated Financial Statements	Note 2 - Summary of significant accounting policies, estimates and judgments Allowance for credit losses - Definition of default Credit impaired financial assets (Stage 3) Note 5 – Loans and allowances for credit losses Loans past due but not impaired
b)	Extent of past due exposures	Consolidated Financial Statements	Note 5 – Loans and allowances for credit losses Loans past due but not impaired
c)	Description of methods used for determining accounting provisions for credit losses	Consolidated Financial Statements	Note 2 - Summary of significant accounting policies, estimates and judgments Allowance for credit losses
	Description of the categorization of ECL accounting provisions (general and specific) for standardized approach exposures	n/a	n/a - For regulatory calculations under both the Standardized and IRB approaches, the IFRS 9 stage 3 allowances are considered to be specific allowances and the IFRS 9 stage 1 and stage 2 allowances are considered to be general allowances
d)	Definition of a restructured exposure	Consolidated Financial Statements	Note 2 - Summary of significant accounting policies, estimates and judgments Allowance for credit losses - Modifications

CRB: Additional disclosure related to the credit quality of assets (continued)

(e) Breakdown of exposures by geographical areas, industry and residual maturity

The following table provides a breakdown of our credit risk exposures by industry, geographical areas and residual maturity. Our classification below reflects the Basel regulatory defined exposure classes. Amounts shown below reflect Exposures at default (EAD), which is the amount expected to be owed by an obligor at the time of default.

As at October 31, 2022

	a	b	c	d	e
	Credit Risk[1,2]			Counterparty Credit Risk[5]	
	On-balance sheet amount	Off-balance sheet amount[3]		Repo-style Transaction	Derivatives
(Millions of Canadian dollars)		Undrawn	Other[4]		
Retail					
Residential secured[6]	393,346	107,604			
Qualifying revolving	32,474	94,949			
Other retail	98,070	19,993	136		
Total Retail	**523,890**	**222,546**	**136**		
Wholesale					
Agriculture	10,417	2,089	36	-	161
Automotive	8,919	9,184	317	-	1,606
Banking	73,335	5,487	1,036	111,559	38,830
Consumer Discretionary	19,666	9,297	569	-	949
Consumer Staples	7,103	6,750	346	-	1,923
Oil and Gas	6,086	11,272	1,923	-	5,959
Financial Services	45,394	25,017	3,530	69,790	24,546
Financing Products	5,762	2,352	163	237	780
Forest Products	1,143	1,033	230	-	78
Governments	279,401	5,678	1,563	18,745	6,290
Industrial Products	10,755	9,319	601	-	1,216
Information Technology	5,291	7,144	298	55	1,908
Investments	23,764	3,946	669	157	458
Mining and Metals	2,377	4,259	945	-	467
Public Works and Infrastructure	2,614	2,417	497	-	144
Real Estate and Related	89,926	18,295	1,872	-	818
Other Services	27,839	13,425	2,848	33	852
Telecommunication and Media	7,301	8,298	79	-	2,751
Transportation	6,394	6,386	930	-	2,069
Utilities	12,318	20,651	5,275	-	5,081
Other Sectors	4,113	1,700	71	73	20,126
Total Wholesale	**649,918**	**173,999**	**23,798**	**200,649**	**117,012**
Total Exposure[1]	**1,173,808**	**396,545**	**23,934**	**200,649**	**117,012**
By Geography[7]					
Canada	697,015	284,705	9,444	79,795	41,923
United States	334,821	79,829	10,145	59,866	24,161
Europe	79,343	25,485	2,603	39,244	36,107
Other International	62,629	6,526	1,742	21,744	14,821
Total Exposure[1,7]	**1,173,808**	**396,545**	**23,934**	**200,649**	**117,012**
By Maturity					
Unconditionally cancellable	74,782	254,437	-	-	-
Within 1 year	393,378	30,301	13,241	200,649	57,882
1 to 5 year	572,186	106,404	9,217	-	39,398
Over 5 years	133,462	5,403	1,476	-	19,732
Total Exposure[1]	**1,173,808**	**396,545**	**23,934**	**200,649**	**117,012**

[1] Excludes securitization, banking book equities and other assets not subject to standardized or IRB approach. Also excludes exposures acquired through the US Government Paycheck Protection Program (PPP).

[2] EAD for Standardized exposures are reported net of Stage 3 allowances and EAD for IRB exposures are reported gross of all allowances for credit loss and partial write-off as per regulatory definitions.

[3] EAD for Undrawn credit commitments and other off-balance sheet amounts are reported after the application of credit conversion factors.

[4] Includes other off-balance sheet exposures such as letters of credit & guarantees.

[5] Counterparty credit risk EAD reflects exposure amount after netting. Collateral is included in EAD for repo-style transactions to the extent allowed by regulatory guidelines. Exchange traded derivatives are included in Other Sectors.

[6] Includes residential mortgages and HELOC.

[7] Geographic profile is based on the country of residence of the borrower.

CRB: Additional disclosure related to the credit quality of assets (continued)

As at July 31, 2022

(Millions of Canadian dollars)	a	b	c	d	e
	Credit Risk[1,2]			Counterparty Credit Risk[5]	
	On-balance sheet amount	Off-balance sheet amount[3]		Repo-style Transaction	Derivatives
		Undrawn	Other[4]		
Retail					
Residential secured[6]	386,876	105,330			
Qualifying revolving	31,403	93,974			
Other retail	95,417	19,614	137		
Total Retail	**513,696**	**218,918**	**137**		
Wholesale					
Agriculture	10,066	2,043	35	-	103
Automotive	8,271	9,324	318	-	1,673
Banking	69,814	4,891	1,043	119,329	33,063
Consumer Discretionary	18,521	9,359	637	-	740
Consumer Staples	6,519	6,400	318	-	1,408
Oil and Gas	5,272	11,535	1,621	-	9,174
Financial Services	42,625	22,886	3,260	67,244	18,496
Financing Products	5,702	2,068	502	364	1,001
Forest Products	1,130	1,017	234	-	34
Governments	274,903	5,126	1,579	21,847	6,851
Industrial Products	10,620	8,936	761	-	702
Information Technology	4,814	6,815	290	71	1,783
Investments	22,983	3,859	663	177	401
Mining and Metals	1,699	3,835	882	-	265
Public Works and Infrastructure	2,180	1,986	442	-	194
Real Estate and Related	86,243	16,379	1,666	-	1,152
Other Services	26,381	12,619	1,781	20	960
Telecommunication and Media	6,732	7,942	70	-	2,595
Transportation	6,293	6,930	882	-	1,823
Utilities	10,504	19,996	5,121	-	5,514
Other Sectors	3,933	2,181	18	63	6,682
Total Wholesale	**625,205**	**166,127**	**22,123**	**209,115**	**94,614**
Total Exposure[1]	**1,138,901**	**385,045**	**22,260**	**209,115**	**94,614**
By Geography[7]					
Canada	695,037	280,248	9,023	89,660	26,992
United States	304,938	74,637	9,202	52,468	28,799
Europe	76,420	23,938	2,430	41,018	29,021
Other International	62,506	6,222	1,605	25,969	9,802
Total Exposure[1,7]	**1,138,901**	**385,045**	**22,260**	**209,115**	**94,614**
By Maturity					
Unconditionally cancellable	73,633	248,668	-	-	-
Within 1 year	382,165	27,734	12,217	209,115	45,431
1 to 5 year	561,825	102,253	9,354	-	30,554
Over 5 years	121,278	6,390	689	-	18,629
Total Exposure[1]	**1,138,901**	**385,045**	**22,260**	**209,115**	**94,614**

[1] Excludes securitization, banking book equities and other assets not subject to standardized or IRB approach. Also excludes exposures acquired through the US Government Paycheck Protection Program (PPP).

[2] EAD for Standardized exposures are reported net of Stage 3 allowances and EAD for IRB exposures are reported gross of all allowances for credit loss and partial write-off as per regulatory definitions.

[3] EAD for Undrawn credit commitments and other off-balance sheet amounts are reported after the application of credit conversion factors.

[4] Includes other off-balance sheet exposures such as letters of credit & guarantees.

[5] Counterparty credit risk EAD reflects exposure amount after netting. Collateral is included in EAD for repo-style transactions to the extent allowed by regulatory guidelines. Exchange traded derivatives are included in Other Sectors.

[6] Includes residential mortgages and HELOC.

[7] Geographic profile is based on the country of residence of the borrower.

CRB: Additional disclosure related to the credit quality of assets (continued)

(f) Amounts of impaired exposures (according to the definition used by the bank for accounting purposes) and related allowances and write-offs, broken down by geographical areas and industry

The following tables provide a breakdown of impaired exposures by geographical areas and industry.

As at October 31, 2022

Impaired exposures by geography[1] and portfolio (Millions of Canadian dollars)	Gross impaired exposures	Allowance[2]	Net impaired exposures
Canada			
Retail	664	177	487
Wholesale	356	115	241
Securities	-	-	-
Total - Canada	**1,020**	**292**	**728**
United States			
Retail	34	2	32
Wholesale	674	175	499
Securities	-	-	-
Total - United States	**708**	**177**	**531**
Other International			
Retail	200	98	102
Wholesale	271	102	169
Securities	150	(23)	173
Total - Other International	**621**	**177**	**444**
Total			
Retail	898	277	621
Wholesale	1,301	392	909
Securities	150	(23)	173
Total impaired exposures	**2,349**	**646**	**1,703**

[1] Geographic information is based on residence of borrower.

[2] Allowance reflects only Stage 3 IFRS 9 allowances and includes allowances on acquired credit-impaired loans and securities.

As at July 31, 2022

Impaired exposures by geography[1] and portfolio (Millions of Canadian dollars)	Gross impaired exposures	Allowance[2]	Net impaired exposures
Canada			
Retail	605	150	455
Wholesale	396	181	215
Securities	-	-	-
Total - Canada	**1,001**	**331**	**670**
United States			
Retail	35	2	33
Wholesale	526	130	396
Securities	-	-	-
Total - United States	**561**	**132**	**429**
Other International			
Retail	191	99	92
Wholesale	306	110	196
Securities	150	(19)	169
Total - Other International	**647**	**190**	**457**
Total			
Retail	831	251	580
Wholesale	1,228	421	807
Securities	150	(19)	169
Total impaired exposures	**2,209**	**653**	**1,556**

[1] Geographic information is based on residence of borrower.

[2] Allowance reflects only Stage 3 IFRS 9 allowances and includes allowances on acquired credit-impaired loans and securities.

CRB: Additional disclosure related to the credit quality of assets (continued)

Net write-offs by geography[1] and portfolio (Millions of Canadian dollars)	For the three months ended October 31, 2022	For the three months ended July 31, 2022
Canada		
Retail	176	154
Wholesale	90	13
Total Canada	**266**	**167**
United States[2]		
Retail	3	1
Wholesale	(6)	33
Total United States	**(3)**	**34**
Other International		
Retail	(1)	6
Wholesale[2]	(8)	(7)
Total Other International	**(9)**	**(1)**
Total		
Retail	178	161
Wholesale	76	39
Total net write-offs	**254**	**200**

[1] Geographic information is based on residence of borrower.

[2] Includes acquired credit-impaired loans related to the acquisition of City National.

CRB: Additional disclosure related to the credit quality of assets (continued)

As at October 31, 2022

Impaired exposures by portfolio and sector (Millions of Canadian dollars)	Gross impaired exposures	Allowance[1]	Net impaired exposures
Retail			
Residential mortgages	560	132	428
Personal	200	97	103
Small business	138	48	90
Total Retail	**898**	**277**	**621**
Wholesale			
Agriculture	18	2	16
Automotive	9	5	4
Banking	1	-	1
Consumer Discretionary	254	50	204
Consumer Staples	122	39	83
Oil and Gas	57	77	(20)
Financial Services	96	26	70
Financial Products	-	-	-
Forest Products	7	1	6
Governments	3	1	2
Industrial Products	77	15	62
Information Technology	5	2	3
Investments	9	2	7
Mining and Metals	12	9	3
Public Works and Infrastructure	16	9	7
Real Estate and Related	322	78	244
Other Services	246	53	193
Telecommunication and Media	8	8	-
Transportation	6	3	3
Utilities	-	-	-
Other	33	12	21
Total Wholesale	**1,301**	**392**	**909**
Total impaired loans and acceptances	**2,199**	**669**	**1,530**
Securities	150	(23)	173
Total impaired exposures	**2,349**	**646**	**1,703**

[1] Allowance reflects only Stage 3 IFRS 9 allowances and includes allowances on acquired credit-impaired loans and securities.

CRB: Additional disclosure related to the credit quality of assets (continued)

As at July 31, 2022

Impaired exposures by portfolio and sector (Millions of Canadian dollars)	Gross impaired exposures	Allowance[1]	Net impaired exposures
Retail			
Residential mortgages	537	127	410
Personal	176	84	92
Small business	118	40	78
Total Retail	**831**	**251**	**580**
Wholesale			
Agriculture	13	2	11
Automotive	12	6	6
Banking	-	(2)	2
Consumer Discretionary	205	32	173
Consumer Staples	111	35	76
Oil and Gas	64	82	(18)
Financial Services	83	23	60
Financial Products	-	-	-
Forest Products	4	1	3
Governments	2	1	1
Industrial Products	65	12	53
Information Technology	6	1	5
Investments	8	3	5
Mining and Metals	10	2	8
Public Works and Infrastructure	18	9	9
Real Estate and Related	326	88	238
Other Services	239	101	138
Telecommunication and Media	12	4	8
Transportation	12	6	6
Utilities	-	-	-
Other	38	15	23
Total Wholesale	**1,228**	**421**	**807**
Total impaired loans and acceptances	**2,059**	**672**	**1,387**
Securities	150	(19)	169
Total impaired exposures	**2,209**	**653**	**1,556**

[1] Allowance reflects only Stage 3 IFRS 9 allowances and includes allowances on acquired credit-impaired loans and securities.

CRB: Additional disclosure related to the credit quality of assets (continued)

(g) Ageing analysis of accounting past-due exposures

The following table provides the ageing of our retail and wholesale past due exposures. Amounts presented may include loans past due as a result of administrative processes, such as mortgage loans on which payments are restrained pending payout due to sale or refinance, which can fluctuate based on business volumes. Past due loans arising from administrative processes are not representative of the borrowers' ability to meet their payment obligations. The table excludes loans less than 30 days past due as they are not generally representative of the borrowers' ability to meet their payment obligations.

As at October 31, 2022

(Millions of Canadian dollars)	30 to 89 days	90 days and greater	Total
Retail	1,328	168	1,496
Wholesale	1,279	2	1,281
Total	**2,607**	**170**	**2,777**

As at July 31, 2022

(Millions of Canadian dollars)	30 to 89 days	90 days and greater	Total
Retail	1,248	150	1,398
Wholesale	1,857	12	1,869
Total	**3,105**	**162**	**3,267**

(h) Breakdown of restructured exposures between impaired and not impaired exposures

Restructured exposures actively benefitting from modified contractual terms as at Oct 31, 2022 are not material (Jul 31, 2022 – not material).

CRC: Qualitative disclosure requirements related to credit risk mitigation techniques

The table below presents an overview of Pillar 3 disclosure requirements that have been met within our 2022 Annual Report and incorporated by reference into this Pillar 3 report. Our 2022 Annual Report is available free of charge on our website at http://www.rbc.com/investorrelations

<table>
<tr><th colspan="2">Pillar 3 disclosures requirement</th><th>2022 Annual Report section</th><th>Sub-section</th></tr>
<tr><td rowspan="3">a)</td><td rowspan="3">Core features of policies and processes for, and an indication of the extent to which the bank makes use of, on- and off-balance sheet netting</td><td>Credit risk</td><td>Credit risk assessment – Counterparty credit risk</td></tr>
<tr><td rowspan="2">Consolidated Financial Statements</td><td>Note 9 - Derivative financial instruments and hedging activities – Derivative-related credit risk</td></tr>
<tr><td>Note 30 - Offsetting financial assets and financial liabilities</td></tr>
<tr><td>b)</td><td>Core features of policies and processes for collateral evaluation and management</td><td>Credit risk</td><td>Credit risk mitigation – Collateral</td></tr>
<tr><td rowspan="3">c)</td><td rowspan="3">Information about market or credit risk concentrations under the credit risk mitigation instruments used</td><td rowspan="2">Credit risk</td><td>Credit risk mitigation</td></tr>
<tr><td>Credit risk approval – Credit risk limits</td></tr>
<tr><td>Consolidated Financial Statements</td><td>Note 9 - Derivative financial instruments and hedging activities</td></tr>
</table>

CR3: Credit risk mitigation techniques – overview

We utilize allowed regulatory credit mitigation techniques to reduce capital requirements associated with our balance sheet exposures. The following table presents a detailed breakdown of our unsecured and secured loan and debt securities exposures. Secured exposures are mitigated by way of additional collateral or guarantees being requested of the borrower. We sometimes also utilize credit derivatives to mitigate our on-balance sheet exposures.

As at October 31, 2022

		a	b	c	d	e	f	g
	(Millions of Canadian dollars)	Exposures unsecured: carrying amount	Exposures secured by collateral	Exposures secured by collateral, of which: secured amount[1]	Exposures secured by financial guarantees[2]	Exposures secured by financial guarantees, of which: secured amount[3]	Exposures secured by credit derivatives	Exposures secured by credit derivatives, of which: secured amount
1	Loans[4]	230,547	460,738	455,985	107,640	96,973	-	-
2	Debt securities	142,959	15,333	15,333	77	-	-	-
3	**Total**	**373,506**	**476,071**	**471,318**	**107,717**	**96,973**	**-**	**-**
4	Of which defaulted[5]	272	1,128	1,128	338	287	-	-

[1] Column c is a subset of column b.

[2] Credit mitigation allocation for multi-secured exposures is made by way of order of priority of available mitigation to be utilized: financial guarantees portion first followed by collateral for any remaining balance.

[3] Column e is a subset of column d.

[4] Securitized mortgages that do not qualify as securitized under IFRS or regulatory capital requirements are recognized as collateralized in column b and column c.

[5] Defaulted exposures are net of Stage 3 allowances.

As at April 30, 2022

		a	b	c	d	e	f	g
	(Millions of Canadian dollars)	Exposures unsecured: carrying amount	Exposures secured by collateral	Exposures secured by collateral, of which: secured amount[1]	Exposures secured by financial guarantees[2]	Exposures secured by financial guarantees, of which: secured amount[3]	Exposures secured by credit derivatives	Exposures secured by credit derivatives, of which: secured amount
1	Loans[4]	217,399	430,229	427,679	104,964	98,814	-	-
2	Debt securities	129,619	14,148	14,148	214	-	-	-
3	**Total**	**347,018**	**444,377**	**441,827**	**105,178**	**98,814**	**-**	**-**
4	Of which defaulted[5]	253	997	997	339	260	-	-

[1] Column c is a subset of column b.

[2] Credit mitigation allocation for multi-secured exposures is made by way of order of priority of available mitigation to be utilized: financial guarantees portion first followed by collateral for any remaining balance.

[3] Column e is a subset of column d.

[4] Securitized mortgages that do not qualify as securitized under IFRS or regulatory capital requirements are recognized as collateralized in column b and column c.

[5] Defaulted exposures are net of Stage 3 allowances.

CRD: Qualitative disclosures on banks' use of external credit ratings under the standardized approach for credit risk

As detailed in section CR4, certain of our portfolios' RWA amounts are calculated as per OSFI's CAR Guideline Standardized Approach requirements. OSFI's Standardized Approach methodology allows for the reliance on the external credit ratings of counterparties, issued by independent rating agencies, for the determination of RWA. Five external rating agencies ratings, namely, Standard & Poor's (S&P), Moody's Investors Service, Fitch Rating Services, DBRS and Kroll Bond Rating Agency, Inc. have been approved by OSFI. Currently, external ratings are used to determine the RWA amounts associated with our wholesale exposures under the asset classes of corporate, sovereign, public sector entities, multilateral development banks, banks and securities firms. As well, external ratings are used for determining the risk weighting for certain of our securitizations exposures.

External ratings utilized from the above-mentioned rating agencies are either an issuer rating or an issue-specific rating. We rely on an issue-specific rating if it is available for the purposes of determining RWA for the exposures we hold. We utilize the issuer rating only for our exposures which rank pari-passu with senior claims of the issuer.

Our supervisor, OSFI, specifies in its CAR guideline the required standard mapping of long term external ratings of the above rating agencies to an equivalent risk weight. We rely on OSFI's mapping to determine the appropriate risk buckets for our Standardized Approach portfolios under the guideline. OSFI's current mapping of external rating agencies rating is reflected in the table below:

Long-term rating					
Standardized Risk Weight Category	**S&P**	**Moody's**	**Fitch**	**DBRS**	**Kroll**
Long Term					
(AAA to AA-)	AAA to AA-	Aaa to Aa3	AAA to AA-	AAA to AA (low)	AAA to AA-
(A+ to A-)	A+ to A-	A1 to A3	A+ to A-	A(high) to A(low)	A+ to A-
(BBB+ to BBB-)	BBB+ to BBB-	Baa1 to Baa3	BBB+ to BBB-	BBB(high) to BBB(low)	BBB+ to BBB-
(BB+ to BB-)	BB+ to BB-	Ba1 to Ba3	BB+ to BB-	BB(high) to BB(low)	BB+ to BB-
(B+ to B-)	B+ to B-	B1 to B3	B+ to B-	B(high) to B(low)	B+ to B-
(Below B-)	Below B-	Below B3	Below B-	CCC or lower	Below B-

We understand that OSFI annually reviews the list of acceptable rating agencies and will reflect any changes in allowed rating agencies in its update to the CAR guidelines.

CR4: Standardized approach – credit risk exposure and credit risk mitigation (CRM) effects

The following table provides the effect of CRM on the calculation of capital requirements under the standardized approach. It presents on-balance sheet and off-balance sheet exposures before and after credit conversion factors (CCF) and CRM as well as associated RWA and RWA density by asset classes. As noted in CRD, the external ratings of the counterparty is relied on to determine the prescribed regulatory risk weight to be assigned.

As at October 31, 2022

		a	b	c	d	e	f
	(Millions of Canadian dollars, except as otherwise noted)	Exposures before CCF and CRM		Exposures post-CCF and CRM		RWA and RWA density	
	Asset Classes	On-balance sheet amount	Off-balance sheet amount	On-balance sheet amount	Off-balance sheet amount	RWA	RWA density
1	Sovereigns and their central banks[1]	37,023	337	52,791	43	79	0.1%
2	Non-central government public sector entities	15,305	427	15,305	187	2,955	19.1%
3	Multilateral development banks	4,380	-	4,380	-	-	-
4	Banks	4,376	545	4,376	190	1,032	22.6%
5	Securities firms[1]	1,707	2,355	2,772	929	1,250	33.8%
6	Corporates[1]	74,431	51,086	61,249	11,790	71,083	97.3%
7	Regulatory retail portfolios	10,334	5,926	10,334	432	8,233	76.5%
8	Secured by residential property[1]	51,523	20	34,602	-	12,931	37.4%
9	Secured by commercial real estate	-	-	-	-	-	-
10	Equity	-	-	-	-	-	-
11	Past-due loans	466	23	466	2	614	131.2%
12	Higher-risk categories	268	288	268	109	565	150.0%
13	Other assets	21,960	-	21,960	-	23,097	105.2%
14	**Total**	**221,773**	**61,007**	**208,503**	**13,682**	**121,839**	**54.8%**

[1] When CRM is available in the form of an eligible guarantee, the portion that is covered by the guarantee will attract the risk weight of the protection provider and will be reflected in the protection provider's asset class in column c and d. Exposures acquired through the US Government Paycheck Protection Program have been excluded, as required by OSFI.

As at July 31, 2022

		a	b	c	d	e	f
	(Millions of Canadian dollars, except as otherwise noted)	Exposures before CCF and CRM		Exposures post-CCF and CRM		RWA and RWA density	
	Asset Classes	On-balance sheet amount	Off-balance sheet amount	On-balance sheet amount	Off-balance sheet amount	RWA	RWA density
1	Sovereigns and their central banks[1]	30,411	286	46,152	40	140	0.3%
2	Non-central government public sector entities	14,689	403	14,689	197	2,774	18.6%
3	Multilateral development banks	4,162	-	4,162	-	-	-
4	Banks	3,182	486	3,182	182	793	23.6%
5	Securities firms[1]	1,625	2,023	2,754	780	1,171	33.1%
6	Corporates[1]	67,537	46,729	55,818	10,488	64,378	97.1%
7	Regulatory retail portfolios	9,640	5,442	9,640	417	7,706	76.6%
8	Secured by residential property[1]	48,449	19	31,579	-	11,779	37.3%
9	Secured by commercial real estate	-	-	-	-	-	-
10	Equity	-	-	-	-	-	-
11	Past-due loans	420	30	420	3	538	127.2%
12	Higher-risk categories	215	294	215	132	520	150.0%
13	Other assets	23,150	-	23,150	-	23,206	100.2%
14	**Total**	**203,480**	**55,712**	**191,761**	**12,239**	**113,005**	**55.4%**

[1] When CRM is available in the form of an eligible guarantee, the portion that is covered by the guarantee will attract the risk weight of the protection provider and will be reflected in the protection provider's asset class in column c and d. Exposures acquired through the US Government Paycheck Protection Program have been excluded, as required by OSFI.

CR5: Standardized approach – exposures by asset classes and risk weights

The following table presents the breakdown of credit risk exposures under the standardized approach by asset classes and risk weight.

As at October 31, 2022

		a	b	c	d	e	f	g	h	i	j
	Risk weight / Asset Classes (Millions of Canadian dollars)	0%	10%	20%	35%	50%	75%	100%	150%	Others	Total credit exposures amount (post CCF and post-CRM)
1	Sovereigns and their central banks	52,755	-	-	-	-	-	79	-	-	52,834
2	Non-central government public sector entities	1,326	-	14,013	-	-	-	153	-	-	15,492
3	Multilateral development banks	4,380	-	-	-	-	-	-	-	-	4,380
4	Banks	-	-	4,407	-	16	-	143	-	-	4,566
5	Securities firms	-	-	2,622	-	708	-	371	-	-	3,701
6	Corporates	-	-	1,276	1,428	14	-	70,321	-	-	73,039
7	Regulatory retail portfolios	-	-	-	-	-	10,135	631	-	-	10,766
8	Secured by residential property	-	-	-	32,551	-	2,051	-	-	-	34,602
9	Secured by commercial real estate	-	-	-	-	-	-	-	-	-	-
10	Equity	-	-	-	-	-	-	-	-	-	-
11	Past-due loans	-	-	-	-	-	-	176	292	-	468
12	Higher-risk categories	-	-	-	-	-	-	-	377	-	377
13	Other assets	2,832	-	-	-	-	-	18,783	-	345	21,960
14	**Total**	**61,293**	**-**	**22,318**	**33,979**	**738**	**12,186**	**90,657**	**669**	**345**	**222,185**

As at July 31, 2022

		a	b	c	d	e	f	g	h	i	j
	Asset Classes (Millions of Canadian dollars) / Risk weight	0%	10%	20%	35%	50%	75%	100%	150%	Others	Total credit exposures amount (post CCF and post-CRM)
1	Sovereigns and their central banks	46,052	-	-	-	-	-	140	-	-	46,192
2	Non-central government public sector entities	1,201	-	13,637	-	2	-	46	-	-	14,886
3	Multilateral development banks	4,162	-	-	-	-	-	-	-	-	4,162
4	Banks	-	-	3,202	-	20	-	142	-	-	3,364
5	Securities firms	-	-	2,511	-	709	-	314	-	-	3,534
6	Corporates	-	-	1,234	1,440	9	-	63,623	-	-	66,306
7	Regulatory retail portfolios	-	-	-	-	-	9,404	653	-	-	10,057
8	Secured by residential property	-	-	-	29,762	-	1,817	-	-	-	31,579
9	Secured by commercial real estate	-	-	-	-	-	-	-	-	-	-
10	Equity	-	-	-	-	-	-	-	-	-	-
11	Past-due loans	-	-	-	-	-	-	192	231	-	423
12	Higher-risk categories	-	-	-	-	-	-	-	347	-	347
13	Other assets	3,814	-	-	-	-	-	19,000	-	336	23,150
14	**Total**	**55,229**	**-**	**20,584**	**31,202**	**740**	**11,221**	**84,110**	**578**	**336**	**204,000**

CRE: Qualitative disclosures related to internal risk-based (IRB) models

In measuring credit risk to determine regulatory capital, two principal approaches applied are: the Internal Ratings Based (IRB) approach and the Standardized approach. The majority of our credit risk exposures are reported under the IRB approach, as approved by OSFI. The remainder of our portfolios are reported under the Standardized approach. The Standardized approach uses risk weights prescribed by OSFI to calculate RWA for credit risk exposures.

Under the IRB approach, we determine our own estimates for Probability of Default (PD), Loss Given Default (LGD) and Exposure at Default (EAD). They are the key credit parameters that form the basis of our credit risk measures. Internal ratings for borrower facilities and their corresponding estimates are used for credit approval, risk management, internal capital allocations, and corporate governance functions. In addition, the IRB parameter estimates are critical inputs for enterprise and regulatory stress-testing.

In accordance with the IRB approach for credit risk, models are designed for wholesale and retail portfolios. For Wholesale portfolios, a PD is estimated for each internal borrower grade and LGD and EAD parameters are estimated for each credit facility. For Retail portfolios, borrowers are risk rated using internal credit scoring models. Credit scores are one of the key drivers for segmentation of the portfolios into pools. Retail PD, EAD and LGD parameters are estimated at the pool level. All IRB approach regulatory capital models for wholesale and retail credit risk are subject to approval by the Office of the Superintendent of Financial Institutions (OSFI).

Credit parameter estimates are based on our internal historical default and loan loss experience and are augmented by external data where appropriate. We employ a two-dimensional risk rating system for the majority of our credit portfolios. The first dimension is oriented to the risk of borrower default and quantified through the PD assigned to the borrower. The second dimension captures transaction-specific factors such as collateral, product type, and seniority, and is quantified by LGD and EAD estimates that apply at the credit facility level.

PD is an estimated percentage that represents the likelihood of default of an obligor within a given time period for a specific rating grade or for a particular pool of exposure. Each wholesale obligor is assigned a Borrower Risk Rating (BRR), reflecting an assessment of the credit quality of the obligor and each BRR has a PD calibrated against it. The assignment of BRRs is based on the evaluation of the obligor's business risk and financial risk and is based on fundamental credit analysis, as well as data-driven modelling. PD estimates are designed to be a long-run average of our experience across the economic cycle with margins of conservatism related to the likely range of errors. The BRR differentiates the riskiness of obligors and represents our evaluation of the obligors' ability and willingness to meet their contractual obligations on time over a three-year time horizon.

EAD is an amount expected to be owed by an obligor at the time of default. EAD is estimated based on the current exposure to the obligor and the possible future changes in that exposure driven by factors such as the nature of the credit commitment. Rates are estimated to reflect an economic downturn, with added conservatism to reflect data and statistical uncertainties identified in the modelling process.

LGD is an estimated percentage of EAD that is not expected to be recovered during the collection and recovery process. Each credit facility is assigned an LGD rate reflective of the extent of losses anticipated in the event the obligor defaults. Factors used in estimating LGD include seniority of debt, collateral security, and the industry sector in which the obligor operates. Estimated LGD rates draw primarily on internal loss experience and appropriate external data is used to supplement the estimation process when necessary. LGD rates are estimated to reflect conditions that might be expected to prevail in an economic downturn, with additional conservatism added to reflect data limitations and statistical uncertainties identified in the estimation process.

The IRB credit risk parameters are reviewed, at a minimum, annually and more frequently if deemed necessary by an independent validation team within the bank. In addition, quarterly monitoring and back-testing procedures are performed to compare the realized results with established estimates by the model development team.

CRE: Qualitative disclosures related to internal risk-based (IRB) models (continued)

EAD Covered by the Various Approaches

The following table outlines the percentage of our EAD covered by the IRB and Standardized approaches for each of our portfolios. The Foundation Internal Ratings Based (FIRB) approach is currently not applied. This table reflects the methodology outlined by OSFI for IRB banks to determine whether they are meeting the 80% threshold calculation minimum requirement.

As at October 31, 2022

	EAD covered by the various approaches[2]		
EAD (in %)	Standardized Approach[1]	IRB Approach	Other
Retail			
Residential secured	14%	86%	-
Qualifying revolving	-	100%	-
Other retail	4%	96%	-
Wholesale	-	-	-
Corporate	18%	82%	-
Sovereign	17%	83%	-
Bank	22%	78%	-
Equity	-	100%	-
Total credit risk	13%	87%	-
Counterparty credit risk	-	80%	20%
Securitization	37%	63%	-
Other assets not subject to Standardized or IRB Approaches	-	-	100%
Total[3]	9%	91%	-

[1] Standardized Approach includes assumptions and waivers granted by OSFI based on an OSFI approved rollout plan.

[2] Effective Q1 2022, counterparty credit risk is separately categorized from wholesale exposures. Prior quarter percentages have been revised from those previously presented to conform to the current period presentation.

[3] The total for this table is calculated using OSFI's guidance on what exposures are included in the 80% Threshold Calculation for IRB banks.

As at July 31, 2022

	EAD covered by the various approaches[2]		
EAD (in %)	Standardized Approach[1]	IRB Approach	Other
Retail			
Residential secured	14%	86%	-
Qualifying revolving	-	100%	-
Other retail	4%	96%	-
Wholesale	-	-	-
Corporate	17%	83%	-
Sovereign	15%	85%	-
Bank	17%	83%	-
Equity	-	100%	-
Total credit risk	12%	88%	-
Counterparty credit risk	-	83%	17%
Securitization	37%	63%	-
Other assets not subject to Standardized or IRB Approaches	-	-	100%
Total[3]	9%	91%	-

[1] Standardized Approach includes assumptions and waivers granted by OSFI based on an OSFI approved rollout plan.

[2] Effective Q1 2022, counterparty credit risk is separately categorized from wholesale exposures. Prior quarter percentages have been revised from those previously presented to conform to the current period presentation.

[3] The total for this table is calculated using OSFI's guidance on what exposures are included in the 80% Threshold Calculation for IRB banks.

CRE: Qualitative disclosures related to internal risk-based (IRB) models (continued)

Parameters Governance

The techniques used to develop models are in accordance with banking industry standards and regulatory requirements. We calibrate our models to ensure that variations of default rates through an economic cycle are included in the underlying data. We also build conservatism into our model development process to reflect statistical uncertainties.

Our models have Model Development Owners (MDO) who are accountable for the development and performance of models within the framework set by our policies, standards and procedures. MDOs are responsible for collecting, defining and documenting model requirements, collecting and reviewing data, testing and evaluating, designing model performance monitoring, and documenting.

Our models are required to be independently reviewed and comprehensively evaluated by the Enterprise Model Risk Management (EMRM) team. EMRM is responsible for the review and challenge of the methodology underpinning the estimation of the parameters. EMRM issues a report at the end of each validation exercise that documents the scope, approach and findings of the review. The parameters reviewed by EMRM are presented to the Credit Models Governance Committee and approved by RBC's senior risk management committee.

Back-testing of Parameters and Model Performance

The IRB credit risk parameters are reviewed, at a minimum, annually and more frequently if deemed necessary. In order to ensure that any material events are identified in a timely fashion, we engage in regular monitoring of realized results against established estimates. In cases where the actual results exceed predefined thresholds, a review of the results will be conducted and documented which may lead to a re-calibration of the parameters. Any recommended changes to the parameters would be approved by the Credit Models Governance Committee, and OSFI as applicable.

CR6: IRB – Credit risk exposures by portfolio and PD range

The following table provides the key parameters used for the calculation of capital requirements for credit risk exposures under the IRB approach, broken down by asset class and PD range.

As at October 31, 2022

			a	b	c	d	e	f	g	h	i	j	k	l
	(Millions of Canadian dollars, except as otherwise noted)	PD scale[1]	Original on-balance sheet gross exposure	Off-balance sheet exposures pre CCF	Average CCF (%)	EAD post CRM and post-CCF	Average PD (%)	Number of obligors[2]	Average LGD (%)	Average maturity (in years)	RWA	RWA density (%)	EL	Provisions[3]
	Asset Classes													
1	**Sovereigns**													
		0.00 to < 0.15	269,508	25,305	52.08	361,083	0.02	1,437	17.29	2.00	13,544	3.8	11	
		0.15 to < 0.25	107	87	56.12	156	0.24	81	26.30	2.02	43	27.7	-	
		0.25 to < 0.50	519	12	49.96	524	0.49	471	26.16	2.64	231	44.0	1	
		0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	
		0.75 to < 2.50	109	96	50.34	120	1.14	68	33.69	2.94	94	78.2	-	
		2.50 to < 10.00	-	8	51.63	4	6.02	14	42.57	1.04	6	148.7	-	
		10.00 to < 100.00	-	2	56.44	1	18.71	6	48.15	1.10	4	249.6	-	
		100.00 (default)	39	69	0.10	39	100.00	4	60.00	2.49	1	1.5	35	
	Total Sovereigns		**270,282**	**25,579**	**51.94**	**361,927**	**0.03**	**2,081**	**17.32**	**2.00**	**13,923**	**3.8**	**47**	**262**
2	**Banks**													
		0.00 to < 0.15	21,178	2,820	50.71	31,951	0.06	251	33.19	2.47	5,610	17.6	3	
		0.15 to < 0.25	43	91	51.63	101	0.24	15	49.72	1.25	46	45.4	-	
		0.25 to < 0.50	367	358	47.50	535	0.49	26	39.57	1.01	264	49.3	1	
		0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	
		0.75 to < 2.50	175	221	51.50	303	1.23	41	47.99	2.10	327	108.0	2	
		2.50 to < 10.00	59	15	50.01	65	2.78	9	44.59	1.61	84	128.5	1	
		10.00 to < 100.00	-	-	-	-	30.41	3	45.00	1.00	1	276.7	-	
		100.00 (default)	-	-	-	-	100.00	3	45.00	1.09	1	596.3	-	
	Total Banks		**21,822**	**3,505**	**50.45**	**32,955**	**0.08**	**348**	**33.51**	**2.44**	**6,333**	**19.2**	**7**	**5**
3	**Corporates**													
		0.00 to < 0.15	77,718	204,050	52.47	183,942	0.08	25,981	39.92	2.29	45,956	25.0	57	
		0.15 to < 0.25	29,873	30,732	49.16	42,097	0.24	9,044	37.17	2.60	18,467	43.9	38	
		0.25 to < 0.50	27,265	21,878	50.51	35,892	0.49	8,282	33.48	2.58	18,963	52.8	58	
		0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	
		0.75 to < 2.50	69,585	61,254	47.39	88,123	1.34	21,316	35.02	2.39	67,609	76.7	416	
		2.50 to < 10.00	13,531	13,177	49.08	15,914	3.94	7,092	35.70	2.67	17,520	110.1	219	
		10.00 to < 100.00	1,032	540	51.07	1,119	26.04	1,099	37.23	1.75	2,116	189.2	109	
		100.00 (default)	1,040	882	33.53	1,196	100.00	1,262	36.49	2.08	3,412	285.2	209	
	Total Corporates		**220,045**	**332,514**	**50.91**	**368,283**	**1.01**	**74,076**	**37.60**	**2.39**	**174,043**	**47.3**	**1,105**	**1,119**
4	**Total Wholesale**		**512,149**	**361,598**	**50.98**	**763,165**	**0.51**	**76,505**	**27.81**	**2.21**	**194,299**	**25.5**	**1,159**	**1,386**

[1] Refer to "Internal ratings map" under the Credit Risk Assessment section in our 2022 Annual Report MD&A.

[2] Number of obligors is defined as the number of borrowers in each PD band. For Retail exposures, a borrower can appear in multiple PD bands if the borrower has more than one type of product with the bank. In addition, Retail obligors include borrowers where the portion of the exposure has been securitized given CAR guideline requirements related to retained interests. Wholesale obligors are reflected as unique borrowers. For example, sovereign obligors include central banks or agencies, public sector entities and multilateral development banks which are each reflected as unique borrowers in the sovereign asset class. Retail borrowers with both Visa and Mastercard are counted as one borrower in the asset class qualifying revolving retail.

[3] Provisions reflect IFRS 9, Stage 1, 2 & 3 allowances under IRB portfolio.

CR6: IRB – Credit risk exposures by portfolio and PD range (continued)

As at October 31, 2022

			a	b	c	d	e	f	g	h	i	j	k	l
	(Millions of Canadian dollars, except as otherwise noted)	PD scale[1]	Original on-balance sheet gross exposure	Off-balance sheet exposures pre CCF	Average CCF (%)	EAD post CRM and post-CCF	Average PD (%)	Number of obligors[2]	Average LGD (%)	Average maturity (in years)	RWA	RWA density (%)	EL	Provisions[3]
	Asset Classes													
5	**Retail insured exposure secured by real estate**													
		0.00 to < 0.15	14,191			1,135	0.14	99,314	16.53		61	5.4	-	
		0.15 to < 0.25	-			-	-	-	-		-	-	-	
		0.25 to < 0.50	43,736			1,910	0.32	180,189	22.30		256	13.4	1	
		0.50 to < 0.75	-			-	-	-	-		-	-	-	
		0.75 to < 2.50	6,073			110	1.22	28,713	14.40		24	21.5	-	
		2.50 to < 10.00	2,527			3	4.99	15,056	16.03		1	54.4	-	
		10.00 to < 100.00	485			2	30.27	2,557	16.30		2	96.2	-	
		100.00 (default)	164			2	100.00	1,052	15.97		4	211.6	-	
	Total Retail insured exposure secured by real estate		**67,176**			**3,162**	**0.37**	**326,881**	**19.94**		**348**	**11.0**	**2**	**7**
6	**Uninsured residential mortgages**													
		0.00 to < 0.15	215,672	293	100.00	215,965	0.13	637,306	18.46		12,051	5.6	51	
		0.15 to < 0.25	149	68	100.00	217	0.22	94	72.24		71	32.9	-	
		0.25 to < 0.50	19	158	100.00	178	0.34	653	16.57		20	11.3	-	
		0.50 to < 0.75	-	-	-	-	-	-	-		-	-	-	
		0.75 to < 2.50	17,326	233	100.00	17,559	0.91	48,119	20.13		4,402	25.1	32	
		2.50 to < 10.00	4,368	15	100.00	4,382	4.28	16,004	18.59		2,585	59.0	35	
		10.00 to < 100.00	915	1	100.00	915	23.91	3,426	17.93		933	101.9	39	
		100.00 (default)	178	-	-	178	100.00	844	17.72		31	17.7	33	
	Total Uninsured residential mortgages		**238,627**	**768**	**100.00**	**239,394**	**0.43**	**706,446**	**18.63**		**20,093**	**8.4**	**190**	**197**

[1] Refer to “Internal ratings map” under the Credit Risk Assessment section in our 2022 Annual Report MD&A.

[2] Number of obligors is defined as the number of borrowers in each PD band. For Retail exposures, a borrower can appear in multiple PD bands if the borrower has more than one type of product with the bank. In addition, Retail obligors include borrowers where the portion of the exposure has been securitized given CAR guideline requirements related to retained interests. Wholesale obligors are reflected as unique borrowers. For example, sovereign obligors include central banks or agencies, public sector entities and multilateral development banks which are each reflected as unique borrowers in the sovereign asset class. Retail borrowers with both Visa and Mastercard are counted as one borrower in the asset class qualifying revolving retail.

[3] Provisions reflect IFRS 9, Stage 1, 2 & 3 allowances under IRB portfolio.

CR6: IRB – Credit risk exposures by portfolio and PD range (continued)

As at October 31, 2022

			a	b	c	d	e	f	g	h	i	j	k	l
	(Millions of Canadian dollars, except as otherwise noted)	PD scale[1]	Original on-balance sheet gross exposure	Off-balance sheet exposures pre CCF	Average CCF (%)	EAD post CRM and post-CCF	Average PD (%)	Number of obligors[2]	Average LGD (%)	Average maturity (in years)	RWA	RWA density (%)	EL	Provisions[3]
	Asset Classes													
7	**HELOCs**													
		0.00 to < 0.15	32,617	114,845	91.48	137,677	0.08	837,726	24.43		7,267	5.3	28	
		0.15 to < 0.25	-	-	-	-	-	-	-		-	-	-	
		0.25 to < 0.50	-	-	-	-	-	-	-		-	-	-	
		0.50 to < 0.75	2,211	1,624	92.00	3,705	0.71	40,122	25.13		983	26.5	7	
		0.75 to < 2.50	-	-	-	-	-	-	-		-	-	-	
		2.50 to < 10.00	852	295	91.59	1,122	4.47	12,992	25.20		890	79.4	13	
		10.00 to < 100.00	137	12	93.09	149	33.27	1,085	24.08		213	143.2	12	
		100.00 (default)	66	1	-	66	100.00	584	25.32		38	57.0	17	
	Total HELOCs		**35,883**	**116,779**	**91.49**	**142,719**	**0.21**	**892,509**	**24.46**		**9,391**	**6.6**	**76**	**73**
8	**Qualifying revolving retail**													
		0.00 to < 0.15	8,616	56,204	77.01	51,898	0.12	4,824,082	93.96		3,506	6.8	56	
		0.15 to < 0.25	9,296	42,726	84.07	45,216	0.18	3,391,636	88.18		4,188	9.3	73	
		0.25 to < 0.50	994	5,993	97.02	6,809	0.39	3,778,185	88.05		1,162	17.1	23	
		0.50 to < 0.75	26	115	93.47	134	0.59	7,353	101.26		37	27.3	1	
		0.75 to < 2.50	8,380	9,390	82.11	16,090	1.28	2,278,680	91.23		7,067	43.9	187	
		2.50 to < 10.00	4,155	2,522	76.59	6,087	3.74	1,257,008	90.37		5,703	93.7	204	
		10.00 to < 100.00	948	365	50.31	1,131	28.47	439,336	91.37		3,010	266.0	294	
		100.00 (default)	58	-	-	58	100.00	37,343	86.90		159	273.5	39	
	Total Qualifying revolving retail		**32,474**	**117,315**	**80.94**	**127,423**	**0.77**	**16,013,623**	**91.06**		**24,832**	**19.5**	**877**	**1,290**
9	**Other retail**													
		0.00 to < 0.15	46,737	5,183	85.32	51,126	0.12	361,800	30.84		4,690	9.2	19	
		0.15 to < 0.25	3,732	9,078	86.03	11,542	0.21	138,431	80.53		4,018	34.8	19	
		0.25 to < 0.50	10,317	1,378	109.91	11,649	0.32	431,814	64.39		4,408	37.8	24	
		0.50 to < 0.75	2,333	1,051	91.62	2,661	0.59	144,801	82.59		1,825	68.6	13	
		0.75 to < 2.50	17,260	3,687	93.05	19,863	1.16	461,203	56.84		12,899	64.9	138	
		2.50 to < 10.00	5,600	1,445	87.52	6,251	4.02	206,613	62.07		5,878	94.0	153	
		10.00 to < 100.00	1,496	299	97.28	1,528	17.61	37,991	58.48		1,887	123.6	166	
		100.00 (default)	211	35	-	105	100.00	8,217	72.28		194	185.1	63	
	Total Other retail		**87,686**	**22,155**	**88.89**	**104,725**	**0.95**	**1,790,870**	**48.60**		**35,799**	**34.2**	**595**	**608**
10	**Total retail**		**461,846**	**257,017**	**86.47**	**617,423**	**0.54**	**19,730,329**	**40.02**	**-**	**90,463**	**14.7**	**1,740**	**2,175**
	Total		**973,995**	**618,615**	**65.73**	**1,380,588**	**0.52**	**19,806,834**	**33.27**	**2.21**	**284,762**	**20.6**	**2,899**	**3,561**

[1] Refer to "Internal ratings map" under the Credit Risk Assessment section in our 2022 Annual Report MD&A.

[2] Number of obligors is defined as the number of borrowers in each PD band. For Retail exposures, a borrower can appear in multiple PD bands if the borrower has more than one type of product with the bank. In addition, Retail obligors include borrowers where the portion of the exposure has been securitized given CAR guideline requirements related to retained interests. Wholesale obligors are reflected as unique borrowers. For example, sovereign obligors include central banks or agencies, public sector entities and multilateral development banks which are each reflected as unique borrowers in the sovereign asset class. Retail borrowers with both Visa and Mastercard are counted as one borrower in the asset class qualifying revolving retail.

[3] Provisions reflect IFRS 9, Stage 1, 2 & 3 allowances under IRB portfolio.

CR6: IRB – Credit risk exposures by portfolio and PD range (continued)

As at July 31, 2022

			a	b	c	d	e	f	g	h	i	j	k	l
	(Millions of Canadian dollars, except as otherwise noted)	PD scale[1]	Original on-balance sheet gross exposure	Off-balance sheet exposures pre CCF	Average CCF (%)	EAD post CRM and post-CCF	Average PD (%)	Number of obligors[2]	Average LGD (%)	Average maturity (in years)	RWA	RWA density (%)	EL	Provisions[3]
	Asset Classes													
1	**Sovereigns**													
		0.00 to < 0.15	266,199	24,074	53.35	358,103	0.02	1,448	17.08	1.95	13,119	3.7	11	
		0.15 to < 0.25	117	78	56.82	161	0.24	81	26.16	2.08	45	28.0	-	
		0.25 to < 0.50	517	16	57.14	525	0.49	481	26.29	2.77	237	45.1	1	
		0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	
		0.75 to < 2.50	101	86	50.34	107	1.14	57	34.28	3.18	87	81.3	-	
		2.50 to < 10.00	1	7	54.10	5	4.22	17	38.80	1.12	6	115.6	-	
		10.00 to < 100.00	-	5	58.40	3	18.51	8	51.40	1.08	8	265.7	-	
		100.00 (default)	73	1	6.01	74	100.00	6	59.10	2.46	1	0.8	68	
	Total Sovereigns		**267,008**	**24,267**	**53.35**	**358,978**	**0.04**	**2,098**	**17.11**	**1.95**	**13,503**	**3.8**	**80**	**264**
2	**Banks**													
		0.00 to < 0.15	23,676	2,580	54.11	34,298	0.06	246	33.34	2.43	6,105	17.8	4	
		0.15 to < 0.25	44	86	51.66	98	0.24	19	49.85	1.30	46	47.2	-	
		0.25 to < 0.50	456	277	45.44	580	0.49	27	38.78	1.01	281	48.4	1	
		0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	
		0.75 to < 2.50	163	192	52.60	261	1.23	33	49.88	2.32	302	115.8	2	
		2.50 to < 10.00	53	74	41.81	83	2.76	9	39.81	2.77	105	126.4	1	
		10.00 to < 100.00	-	-	-	-	30.78	3	45.00	1.00	1	277.1	-	
		100.00 (default)	-	-	-	-	100.00	3	45.00	1.21	1	596.3	-	
	Total Banks		**24,392**	**3,209**	**52.92**	**35,320**	**0.08**	**340**	**33.62**	**2.41**	**6,841**	**19.4**	**8**	**2**
3	**Corporates**													
		0.00 to < 0.15	75,712	191,161	52.19	174,082	0.08	25,155	40.08	2.31	43,559	25.0	54	
		0.15 to < 0.25	28,315	28,721	50.13	40,311	0.24	8,892	35.95	2.54	16,407	40.7	35	
		0.25 to < 0.50	27,633	21,612	50.08	35,860	0.49	8,301	33.57	2.60	19,008	53.0	58	
		0.50 to < 0.75	-	-	-	-	-	-	-	-	-	-	-	
		0.75 to < 2.50	66,790	61,163	47.24	85,152	1.35	21,247	35.53	2.43	67,046	78.7	406	
		2.50 to < 10.00	11,358	15,450	47.80	15,439	3.86	6,749	36.63	2.70	17,393	112.7	214	
		10.00 to < 100.00	992	467	50.46	1,042	26.40	1,105	36.71	1.79	1,936	185.8	101	
		100.00 (default)	970	805	34.97	1,111	100.00	1,179	37.38	2.06	3,521	316.8	176	
	Total Corporates		**211,768**	**319,381**	**50.66**	**352,997**	**1.00**	**72,628**	**37.68**	**2.41**	**168,870**	**47.8**	**1,044**	**990**
4	**Total Wholesale**		**503,168**	**346,857**	**50.87**	**747,295**	**0.50**	**75,066**	**27.61**	**2.19**	**189,214**	**25.3**	**1,132**	**1,256**

[1] Refer to "Internal ratings map" under the Credit Risk Assessment section in our 2021 Annual Report MD&A.

[2] Number of obligors is defined as the number of borrowers in each PD band. For Retail exposures, a borrower can appear in multiple PD bands if the borrower has more than one type of product with the bank. In addition, Retail obligors include borrowers where the portion of the exposure has been securitized given CAR guideline requirements related to retained interests. Wholesale obligors are reflected as unique borrowers. For example, sovereign obligors include central banks or agencies, public sector entities and multilateral development banks which are each reflected as unique borrowers in the sovereign asset class. Retail borrowers with both Visa and Mastercard are counted as one borrower in the asset class qualifying revolving retail.

[3] Effective Q1 2022, provisions reflect IFRS 9, Stage 1, 2 & 3 allowances under IRB portfolio.

CR6: IRB – Credit risk exposures by portfolio and PD range (continued)

As at July 31, 2022

			a	b	c	d	e	f	g	h	i	j	k	l
	(Millions of Canadian dollars, except as otherwise noted)	PD scale[1]	Original on-balance sheet gross exposure	Off-balance sheet exposures pre CCF	Average CCF (%)	EAD post CRM and post-CCF	Average PD (%)	Number of obligors[2]	Average LGD (%)	Average maturity (in years)	RWA	RWA density (%)	EL	Provisions[3]
	Asset Classes													
5	**Retail insured exposure secured by real estate**													
		0.00 to < 0.15	14,828			1,182	0.14	102,636	16.60		64	5.4	-	
		0.15 to < 0.25	-			-	-	-	-		-	-	-	
		0.25 to < 0.50	43,674			1,864	0.32	181,341	22.14		249	13.3	1	
		0.50 to < 0.75	-			-	-	-	-		-	-	-	
		0.75 to < 2.50	6,410			128	1.23	30,036	13.97		27	21.0	-	
		2.50 to < 10.00	2,637			3	4.96	15,692	15.34		2	51.9	-	
		10.00 to < 100.00	465			1	30.84	2,481	15.42		1	90.5	-	
		100.00 (default)	163			2	100.00	1,032	13.90		3	184.1	-	
	Total Retail insured exposure secured by real estate		**68,177**			**3,181**	**0.37**	**333,218**	**19.74**		**346**	**10.9**	**2**	**7**
6	**Uninsured residential mortgages**													
		0.00 to < 0.15	210,296	385	100.00	210,681	0.13	629,742	18.37		11,697	5.6	49	
		0.15 to < 0.25	164	69	100.00	232	0.22	104	72.24		76	32.9	-	
		0.25 to < 0.50	22	313	100.00	335	0.33	1,042	14.20		31	9.4	-	
		0.50 to < 0.75	-	-	-	-	-	-	-		-	-	-	
		0.75 to < 2.50	18,424	275	100.00	18,699	0.91	50,206	21.07		4,906	26.2	36	
		2.50 to < 10.00	4,245	19	100.00	4,264	4.14	16,144	18.58		2,474	58.0	33	
		10.00 to < 100.00	832	1	100.00	833	23.65	3,309	17.50		821	98.5	34	
		100.00 (default)	157	-	-	157	100.00	761	17.29		49	31.3	26	
	Total Uninsured residential mortgages		**234,140**	**1,062**	**100.00**	**235,202**	**0.41**	**701,308**	**18.63**		**20,054**	**8.5**	**178**	**177**

[1] Refer to "Internal ratings map" under the Credit Risk Assessment section in our 2021 Annual Report MD&A.

[2] Number of obligors is defined as the number of borrowers in each PD band. For Retail exposures, a borrower can appear in multiple PD bands if the borrower has more than one type of product with the bank. In addition, Retail obligors include borrowers where the portion of the exposure has been securitized given CAR guideline requirements related to retained interests. Wholesale obligors are reflected as unique borrowers. For example, sovereign obligors include central banks or agencies, public sector entities and multilateral development banks which are each reflected as unique borrowers in the sovereign asset class. Retail borrowers with both Visa and Mastercard are counted as one borrower in the asset class qualifying revolving retail.

[3] Effective Q1 2022, provisions reflect IFRS 9, Stage 1, 2 & 3 allowances under IRB portfolio.

CR6: IRB – Credit risk exposures by portfolio and PD range (continued)

As at July 31, 2022

			a	b	c	d	e	f	g	h	i	j	k	l
	(Millions of Canadian dollars, except as otherwise noted)	PD scale[1]	Original on-balance sheet gross exposure	Off-balance sheet exposures pre CCF	Average CCF (%)	EAD post CRM and post-CCF	Average PD (%)	Number of obligors[2]	Average LGD (%)	Average maturity (in years)	RWA	RWA density (%)	EL	Provisions[3]
	Asset Classes													
7	**HELOCs**													
		0.00 to < 0.15	32,689	111,963	91.47	135,102	0.08	829,869	24.55		7,166	5.3	27	
		0.15 to < 0.25	-	-	-	-	-	-	-		-	-	-	
		0.25 to < 0.50	-	-	-	-	-	-	-		-	-	-	
		0.50 to < 0.75	2,237	1,694	91.92	3,795	0.71	42,440	25.52		1,022	26.9	7	
		0.75 to < 2.50	-	-	-	-	-	-	-		-	-	-	
		2.50 to < 10.00	898	310	91.47	1,181	4.50	13,314	24.92		927	78.5	13	
		10.00 to < 100.00	108	16	90.88	122	35.05	1,007	24.77		178	145.9	11	
		100.00 (default)	50	1	-	50	100.00	484	25.64		30	58.8	13	
	Total HELOCs		**35,982**	**113,984**	**91.48**	**140,250**	**0.20**	**887,114**	**24.58**		**9,323**	**6.6**	**71**	**67**
8	**Qualifying revolving retail**													
		0.00 to < 0.15	8,152	55,158	77.01	50,628	0.12	4,740,710	93.96		3,420	6.8	55	
		0.15 to < 0.25	9,064	42,449	84.06	44,748	0.18	3,359,703	88.18		4,144	9.3	72	
		0.25 to < 0.50	948	5,946	96.99	6,715	0.39	3,712,806	88.02		1,146	17.1	23	
		0.50 to < 0.75	26	114	93.61	133	0.59	7,313	101.20		36	27.3	1	
		0.75 to < 2.50	8,139	9,491	82.08	15,930	1.28	2,282,466	91.20		7,007	44.0	186	
		2.50 to < 10.00	4,148	2,597	76.62	6,138	3.74	1,269,493	90.36		5,749	93.7	206	
		10.00 to < 100.00	878	337	46.91	1,036	28.73	395,667	91.67		2,767	267.0	272	
		100.00 (default)	48	-	-	48	100.00	31,788	86.84		140	294.1	31	
	Total Qualifying revolving retail		**31,403**	**116,093**	**80.95**	**125,376**	**0.76**	**15,799,946**	**91.04**		**24,409**	**19.5**	**845**	**1,209**
9	**Other retail**													
		0.00 to < 0.15	44,831	4,977	85.28	49,041	0.12	347,437	30.75		4,474	9.1	18	
		0.15 to < 0.25	3,818	8,885	86.04	11,462	0.21	135,309	80.46		3,987	34.8	19	
		0.25 to < 0.50	10,092	1,329	109.90	11,366	0.32	431,838	64.59		4,321	38.0	24	
		0.50 to < 0.75	2,238	1,041	91.15	2,542	0.59	141,838	83.47		1,761	69.3	12	
		0.75 to < 2.50	17,357	3,682	92.98	19,946	1.16	461,205	56.87		12,965	65.0	139	
		2.50 to < 10.00	5,718	1,500	87.46	6,384	3.98	207,707	62.57		6,048	94.7	157	
		10.00 to < 100.00	1,470	306	97.36	1,499	17.02	37,326	59.10		1,852	123.6	160	
		100.00 (default)	175	34	-	94	100.00	7,219	70.38		173	184.9	55	
	Total Other retail		**85,699**	**21,755**	**88.86**	**102,334**	**0.95**	**1,769,879**	**48.91**		**35,581**	**34.8**	**584**	**582**
10	**Total retail**		**455,401**	**252,894**	**86.45**	**606,343**	**0.52**	**19,491,465**	**40.10**	**-**	**89,713**	**14.8**	**1,680**	**2,042**
	Total		**958,569**	**599,751**	**65.87**	**1,353,638**	**0.51**	**19,566,531**	**33.20**	**2.19**	**278,927**	**20.6**	**2,812**	**3,298**

[1] Refer to “Internal ratings map” under the Credit Risk Assessment section in our 2021 Annual Report MD&A.

[2] Number of obligors is defined as the number of borrowers in each PD band. For Retail exposures, a borrower can appear in multiple PD bands if the borrower has more than one type of product with the bank. In addition, Retail obligors include borrowers where the portion of the exposure has been securitized given CAR guideline requirements related to retained interests. Wholesale obligors are reflected as unique borrowers. For example, sovereign obligors include central banks or agencies, public sector entities and multilateral development banks which are each reflected as unique borrowers in the sovereign asset class. Retail borrowers with both Visa and Mastercard are counted as one borrower in the asset class qualifying revolving retail.

[3] Effective Q1 2022, provisions reflect IFRS 9, Stage 1, 2 & 3 allowances under IRB portfolio.

CR7: IRB – Effect on RWA of credit derivatives used as CRM techniques

The following table provides the effect of credit derivatives used as mitigation techniques in determining RWA amounts. Currently no credit derivatives are used for mitigation.

As at October 31, 2022

		a	b
	(Millions of Canadian dollars)	Pre-credit derivatives RWA	Actual RWA
2	Sovereign - AIRB	-	-
4	Banks - AIRB	-	-
6	Corporate - AIRB	-	-
8	Specialised lending - AIRB	-	-
9	Retail - qualifying revolving (QRRE)	-	-
10	Retail - residential mortgage exposures	-	-
11	Retail - SME	-	-
12	Other retail exposures	-	-
14	Equity - AIRB	-	-
16	Purchased receivables - AIRB	-	-
17	**Total**	**-**	**-**

As at July 31, 2022

		a	b
	(Millions of Canadian dollars)	Pre-credit derivatives RWA	Actual RWA
2	Sovereign - AIRB	-	-
4	Banks - AIRB	-	-
6	Corporate - AIRB	-	-
8	Specialised lending - AIRB	-	-
9	Retail - qualifying revolving (QRRE)	-	-
10	Retail - residential mortgage exposures	-	-
11	Retail - SME	-	-
12	Other retail exposures	-	-
14	Equity - AIRB	-	-
16	Purchased receivables - AIRB	-	-
17	**Total**	**-**	**-**

CR8: RWA flow statements of credit risk exposures

The following table presents the changes in Standardized and IRB RWA amounts over the reporting period for the key drivers of credit risk.

		RWA amounts[1]	
	(Millions of Canadian dollars)	As at October 31, 2022	As at July 31, 2022
1	**RWA as at end of previous reporting period**	**429,452**	**419,124**
2	Asset size[2]	7,020	13,558
3	Asset quality[3]	(750)	(1,285)
4	Model updates[4]	-	-
5	Methodology and policy[5]	-	-
6	Acquisitions and disposals	377	-
7	Foreign exchange movements	11,568	(1,315)
8	Other	(1,413)	(630)
9	**RWA as at end of reporting period**	**446,254**	**429,452**

[1] RWA flow amounts include both IRB and Standardized Approach figures reflecting our approved roll-out plan for transition to IRB.

[2] Organic changes in portfolio size and composition (including new business and maturing loans).

[3] Quality of book changes caused by experience such as underlying customer behaviour or demographics and credit mitigation.

[4] Updates to the model to reflect recent experience, model implementation, change in model scope or any change to address model malfunctions including changes through model calibrations/realignments.

[5] Methodology changes to the calculations driven by regulatory policy changes.

CR9: IRB – Backtesting of probability of default (PD) per portfolio

The following table presents a comparison of the PD used in our IRB models with the effective default rates of the bank’s obligors in order to validate the reliability of our PD calculations.

As at October 31, 2022

	a	b	c					d	e	f		g	h	i
	(Millions of Canadian dollars, except as otherwise noted) **Asset Classes**	PD Range[1]	External rating equivalent					Weighted average PD[2]	Arithmetic average PD by obligors[2]	Number of obligors[3]		Defaulted obligors in the year[4,6]	of which: new defaulted obligors in the year[5,6]	Average historical annual default rate
			S&P	Moody's	Fitch	DBRS	Kroll			End of previous year	End of the year			
1	**Sovereigns**													
		0.00 to < 0.15	AAA to A-	Aaa to A3	AAA to A-	AAA to AL	AAA to A-	0.02	0.06	1,553	1,437	4	-	0.06%
		0.15 to < 0.25	BBB+ to BBB	Baa1 to Baa2	BBB+ to BBB	BBBH to BBB	BBB+ to BBB	0.24	0.24	77	81	-	-	-
		0.25 to < 0.50	BBB- to BB+	Baa3 to Ba1	BBB- to BB+	BBBL to BBH	BBB- to BB+	0.49	0.50	424	471	-	-	-
		0.50 to < 0.75	BB	Ba2	BB	BB	BB	-	-	-	-	-	-	-
		0.75 to < 2.50	BB- to B+	Ba3 to B1	BB- to B+	BBL to BH	BB- to B+	1.14	1.21	62	68	-	-	-
		2.50 to < 10.00	B to CCC+	B2 to Caa1	B to CCC+	BL to CCCH	B to CCC+	6.02	4.94	10	14	-	-	-
		10.00 to < 100.00	CCC to CC	Caa2 to Ca	CCC or CC	CCC or CC	CCC or CC	18.71	22.78	5	6	-	-	2.50%
		100.00 (default)	C or lower	C or lower	C or lower	C or lower	C or lower	100.00	100.00	2	4	-	-	-
	Total Sovereigns							**0.03**	**0.50**	**2,133**	**2,081**	**4**	**-**	
2	**Banks**													
		0.00 to < 0.15	AAA to A-	Aaa to A3	AAA to A-	AAA to AL	AAA to A-	0.06	0.07	238	251	-	-	-
		0.15 to < 0.25	BBB+ to BBB	Baa1 to Baa2	BBB+ to BBB	BBBH to BBB	BBB+ to BBB	0.24	0.24	23	15	1	-	0.33%
		0.25 to < 0.50	BBB- to BB+	Baa3 to Ba1	BBB- to BB+	BBBL to BBH	BBB- to BB+	0.49	0.50	26	26	-	-	-
		0.50 to < 0.75	BB	Ba2	BB	BB	BB	-	-	-	-	-	-	-
		0.75 to < 2.50	BB- to B+	Ba3 to B1	BB- to B+	BBL to BH	BB- to B+	1.23	1.34	33	41	-	-	-
		2.50 to < 10.00	B to CCC+	B2 to Caa1	B to CCC+	BL to CCCH	B to CCC+	2.78	3.11	9	9	-	-	-
		10.00 to < 100.00	CCC to CC	Caa2 to Ca	CCC or CC	CCC or CC	CCC or CC	30.41	22.78	3	3	-	-	-
		100.00 (default)	C or lower	C or lower	C or lower	C or lower	C or lower	100.00	100.00	-	3	-	-	-
	Total Banks							**0.08**	**1.40**	**332**	**348**	**1**	**-**	

[1] Refer to "Internal ratings map" under the Credit Risk Assessment section in our 2022 Annual Report MD&A.

[2] Weighted average PD means PD (after CRM) weighted by EAD as at October 31, 2022. Arithmetic average PD is the sum of all the PDs (after CRM) over the number of accounts as at October 31, 2022.

[3] Number of obligors is defined as the number of borrowers in each PD band. For Retail exposures, a borrower can appear in multiple PD bands if the borrower has more than one type of product with the bank. Wholesale obligors are reflected as unique borrowers. For example, sovereign obligors include central banks or agencies, public sector entities and multilateral development banks which are each reflected as unique borrowers in the sovereign asset class.

[4] Number of defaulted obligors in the year includes i) existing obligors not in default at the beginning of the year who went into default during the year; and ii) new obligors in the year who went into default.

[5] Number of new defaulted obligors in the year reflects the amount in column g that relates to new obligors in the year who went into default.

[6] Defaulted obligors reflects obligors who were in default after 90 days that have either returned to performing status or were written-off. For example, unadvised overdraft facilities have been included that returned to performing status.

[7] Retail insured exposures secured by real estate includes residential mortgages and other retail. Exposures are insured with government and/or private insurance providers.

CR9: IRB – Backtesting of probability of default (PD) per portfolio (continued)

As at October 31, 2022

	a	b	c					d	e	f		g	h	i
	(Millions of Canadian dollars, except as otherwise noted)	PD Range[1]	External rating equivalent					Weighted average PD[2]	Arithmetic average PD by obligors[2]	Number of obligors[3]		Defaulted obligors in the year[4,6]	of which: new defaulted obligors in the year[5,6]	Average historical annual default rate
	Asset Classes		S&P	Moody's	Fitch	DBRS	Kroll			End of previous year	End of the year			
3	**Corporates**													
		0.00 to < 0.15	AAA to A-	Aaa to A3	AAA to A-	AAA to AL	AAA to A-	0.08	0.09	20,537	25,981	1	-	0.01%
		0.15 to < 0.25	BBB+ to BBB	Baa1 to Baa2	BBB+ to BBB	BBBH to BBB	BBB+ to BBB	0.24	0.24	7,625	9,044	1	-	0.07%
		0.25 to < 0.50	BBB- to BB+	Baa3 to Ba1	BBB- to BB+	BBBL to BBH	BBB- to BB+	0.49	0.50	7,107	8,282	8	-	0.13%
		0.50 to < 0.75	BB	Ba2	BB	BB	BB	-	-	-	-	-	-	-
		0.75 to < 2.50	BB- to B+	Ba3 to B1	BB- to B+	BBL to BH	BB- to B+	1.34	1.39	20,629	21,316	44	-	0.37%
		2.50 to < 10.00	B to CCC+	B2 to Caa1	B to CCC+	BL to CCCH	B to CCC+	3.94	4.26	7,709	7,092	52	-	1.51%
		10.00 to < 100.00	CCC to CC	Caa2 to Ca	CCC or CC	CCC or CC	CCC or CC	26.04	25.82	1,262	1,099	81	-	14.11%
		100.00 (default)	C or lower	C or lower	C or lower	C or lower	C or lower	100.00	100.00	1,129	1,262	-	-	-
	Total Corporates							**1.01**	**3.02**	**65,998**	**74,076**	**187**	**-**	
4	**Total Wholesale**									**68,463**	**76,505**	**192**	**-**	
5	**Retail residential mortgages excl. HELOCs[7]**													
		0.00 to < 0.15						0.13	0.13	802,124	736,620	273	8	0.05%
		0.15 to < 0.25						0.22	0.22	104	94	-	-	0.12%
		0.25 to < 0.50						0.32	0.32	187,639	180,842	129	1	0.09%
		0.50 to < 0.75						-	-	-	-	-	-	-
		0.75 to < 2.50						0.91	1.06	92,301	76,832	285	4	0.38%
		2.50 to < 10.00						4.29	4.48	36,618	31,060	606	7	1.76%
		10.00 to < 100.00						23.92	26.31	5,919	5,983	1,186	4	18.65%
		100.00 (default)						100.00	100.00	2,285	1,896	-	-	
	Total Retail residential mortgages excl. HELOCs[7]							**0.43**	**0.70**	**1,126,990**	**1,033,327**	**2,479**	**24**	
6	**HELOCs**													
		0.00 to < 0.15						0.08	0.08	794,695	837,726	410	4	0.04%
		0.15 to < 0.25						-	-	-	-	-	-	-
		0.25 to < 0.50						-	-	-	-	-	-	-
		0.50 to < 0.75						0.71	0.71	43,338	40,122	117	4	0.34%
		0.75 to < 2.50						-	-	-	-	-	-	-
		2.50 to < 10.00						4.47	4.29	14,320	12,992	283	1	2.08%
		10.00 to < 100.00						33.27	33.81	804	1,085	248	-	24.80%
		100.00 (default)						100.00	100.00	557	584	-	-	
	Total HELOCs							**0.21**	**0.28**	**853,714**	**892,509**	**1,058**	**9**	

[1] Refer to "Internal ratings map" under the Credit Risk Assessment section in our 2022 Annual Report MD&A.

[2] Weighted average PD means PD (after CRM) weighted by EAD as at October 31, 2022. Arithmetic average PD is the sum of all the PDs (after CRM) over the number of accounts as at October 31, 2022.

[3] Number of obligors is defined as the number of borrowers in each PD band. For Retail exposures, a borrower can appear in multiple PD bands if the borrower has more than one type of product with the bank. Wholesale obligors are reflected as unique borrowers. For example, sovereign obligors include central banks or agencies, public sector entities and multilateral development banks which are each reflected as unique borrowers in the sovereign asset class.

[4] Number of defaulted obligors in the year includes i) existing obligors not in default at the beginning of the year who went into default during the year; and ii) new obligors in the year who went into default.

[5] Number of new defaulted obligors in the year reflects the amount in column g that relates to new obligors in the year who went into default.

[6] Defaulted obligors reflects obligors who were in default after 90 days that have either returned to performing status or were written-off. For example, unadvised overdraft facilities have been included that returned to performing status.

[7] Retail insured exposures secured by real estate includes residential mortgages and other retail. Exposures are insured with government and/or private insurance providers.

CR9: IRB – Backtesting of probability of default (PD) per portfolio (continued)

As at October 31, 2022

	a	b	c					d	e	f		g	h	i
	(Millions of Canadian dollars, except as otherwise noted) Asset Classes	PD Range[1]	External rating equivalent					Weighted average PD[2]	Arithmetic average PD by obligors[2]	Number of obligors[3]		Defaulted obligors in the year[4,6]	of which: new defaulted obligors in the year[5,6]	Average historical annual default rate
			S&P	Moody's	Fitch	DBRS	Kroll			End of previous year	End of the year			
7	**Qualifying revolving retail[6]**													
		0.00 to < 0.15						0.12	0.12	4,720,066	4,824,082	4,253	707	0.10%
		0.15 to < 0.25						0.18	0.17	3,258,722	3,391,636	3,761	60	0.13%
		0.25 to < 0.50						0.39	0.40	3,673,085	3,778,185	12,464	293	0.33%
		0.50 to < 0.75						0.59	0.59	7,876	7,353	16	-	0.18%
		0.75 to < 2.50						1.28	1.44	2,387,159	2,278,680	25,380	531	1.16%
		2.50 to < 10.00						3.74	4.20	1,453,481	1,257,008	35,526	602	2.79%
		10.00 to < 100.00						28.47	34.10	422,099	439,336	119,944	27,463	33.44%
		100.00 (default)						100.00	100.00	26,559	37,343	-	-	
	Total Qualifying revolving retail							**0.77**	**1.89**	**15,949,047**	**16,013,623**	**201,344**	**29,656**	
8	**Other retail**													
		0.00 to < 0.15						0.12	0.13	148,897	361,800	7,699	7,568	0.05%
		0.15 to < 0.25						0.21	0.23	132,435	138,431	51	2	0.06%
		0.25 to < 0.50						0.32	0.33	512,731	431,814	431	25	0.14%
		0.50 to < 0.75						0.59	0.60	103,184	144,801	455	8	0.29%
		0.75 to < 2.50						1.16	1.34	586,117	461,203	8,072	233	1.11%
		2.50 to < 10.00						4.02	4.65	251,224	206,613	28,308	145	4.92%
		10.00 to < 100.00						17.61	24.50	39,221	37,991	14,974	66	32.80%
		100.00 (default)						100.00	100.00	3,747	8,217	-	-	
	Total Other retail							**0.95**	**2.03**	**1,777,556**	**1,790,870**	**59,990**	**8,047**	
9	**Total retail**									**19,707,307**	**19,730,329**	**264,871**	**37,736**	
	Total									**19,775,770**	**19,806,834**	**265,063**	**37,736**	

[1] Refer to "Internal ratings map" under the Credit Risk Assessment section in our 2022 Annual Report MD&A.

[2] Weighted average PD means PD (after CRM) weighted by EAD as at October 31, 2022. Arithmetic average PD is the sum of all the PDs (after CRM) over the number of accounts as at October 31, 2022.

[3] Number of obligors is defined as the number of borrowers in each PD band. For Retail exposures, a borrower can appear in multiple PD bands if the borrower has more than one type of product with the bank. Wholesale obligors are reflected as unique borrowers. For example, sovereign obligors include central banks or agencies, public sector entities and multilateral development banks which are each reflected as unique borrowers in the sovereign asset class.

[4] Number of defaulted obligors in the year includes i) existing obligors not in default at the beginning of the year who went into default during the year; and ii) new obligors in the year who went into default.

[5] Number of new defaulted obligors in the year reflects the amount in column g that relates to new obligors in the year who went into default.

[6] Defaulted obligors reflects obligors who were in default after 90 days that have either returned to performing status or were written-off. For example, unadvised overdraft facilities have been included that returned to performing status.

[7] Retail insured exposures secured by real estate includes residential mortgages and other retail. Exposures are insured with government and/or private insurance providers.

COUNTERPARTY CREDIT RISK

CCRA: Qualitative disclosure related to counterparty credit risk

The table below presents an overview of Pillar 3 disclosure requirements that have been met within our 2022 Annual Report and incorporated by reference into this Pillar 3 report. Our 2022 Annual Report is available free of charge on our website at http://www.rbc.com/investorrelations

Pillar 3 disclosures requirement		2022 Annual Report section	Sub-section
a)	Risk management objectives and policies related to counterparty credit risk	Credit risk	Credit risk assessment – *Counterparty credit risk*
		Consolidated Financial Statements	Note 9 - Derivative financial instruments and hedging activities – *Derivative-related credit risk*
b)	The method used to assign the operating limits defined in terms of internal capital for counterparty credit exposures and for CCP exposures	Credit risk	Credit risk assessment – *Counterparty credit risk*
c)	Policies relating to guarantees and other risk mitigants and assessments concerning counterparty credit risk, including exposures towards CCPs	Credit risk	Credit risk assessment – *Counterparty credit risk*
		Consolidated Financial Statements	Note 9 - Derivative financial instruments and hedging activities – *Derivative-related credit risk*
			Note 30 - Offsetting financial assets and financial liabilities
d)	Policies with respect to wrong-way risk exposures	Credit risk	Credit risk assessment – *Wrong-way risk*
e)	The impact in terms of the amount of collateral that the bank would be required to provide given a credit rating downgrade	Liquidity and funding risk	Credit ratings

CCR1: Analysis of counterparty credit risk (CCR) exposure by approach

The following table provides a comprehensive view of the methods used to calculate counterparty credit risk exposures and the main parameters used within each method, if applicable. Refer to CCR 8 for our central counterparty clearing house exposures. Figures below reflect both house and client trades.

As at October 31, 2022

		a	b	c	d	e	f
	(Millions of Canadian dollars, except as otherwise noted)	Replacement Cost	Potential future exposure	EEPE	Alpha used for computing regulatory EAD	EAD post-CRM[1]	RWA[2]
1	SA-CCR (for derivatives)[1,2]	27,369	36,551		1.4	89,052	25,143
1a	Current Exposure Method (CEM - for derivatives)						
2	Internal Model Method (for derivatives and SFTs)						
3	Simple Approach for credit risk mitigation (for SFTs)						
4	Comprehensive Approach for credit risk mitigation (for SFTs)					195,993	9,089
5	VaR for SFTs						
6	**Total**						**34,232**

[1] Effective Q1 2020, specific wrong way risk is reflected as per OSFI SA-CCR guideline requirement.

[2] RWA includes a calibration adjustment of 1.06% as prescribed by OSFI under the Basel III framework.

As at July 31, 2022

		a	b	c	d	e	f
	(Millions of Canadian dollars, except as otherwise noted)	Replacement Cost	Potential future exposure	EEPE	Alpha used for computing regulatory EAD	EAD post-CRM[1]	RWA[2]
1	SA-CCR (for derivatives)[1,2]	21,529	37,450		1.4	82,179	25,083
1a	Current Exposure Method (CEM - for derivatives)						
2	Internal Model Method (for derivatives and SFTs)						
3	Simple Approach for credit risk mitigation (for SFTs)						
4	Comprehensive Approach for credit risk mitigation (for SFTs)					205,960	8,724
5	VaR for SFTs						
6	**Total**						**33,807**

[1] Effective Q1 2020, specific wrong way risk is reflected as per OSFI SA-CCR guideline requirement.

[2] RWA includes a calibration adjustment of 1.06% as prescribed by OSFI under the Basel III framework.

CCR2: Credit valuation adjustment (CVA) capital charge

The following table presents a breakdown of the CVA capital charge by advanced and standardized approaches.

As at October 31, 2022

		a	b
	(Millions of Canadian dollars)	EAD post-CRM[1]	RWA[1]
	Total portfolios subject to the Advanced CVA capital charge		
1	(i) VaR component (including the 3x multiplier)		
2	(ii) Stressed VaR component (including the 3x multiplier)		
3	All portfolios subject to the Standardized CVA capital Charge	89,488	15,682
4	**Total subject to the CVA capital charge**	**89,488**	**15,682**

[1] Effective Q1 2019, OSFI has allowed a 0.7 scalar to be applied to the exposure amount determined under SA-CCR for the purpose of determining CVA.

As at July 31, 2022

		a	b
	(Millions of Canadian dollars)	EAD post-CRM[1]	RWA[1]
	Total portfolios subject to the Advanced CVA capital charge		
1	(i) VaR component (including the 3x multiplier)		
2	(ii) Stressed VaR component (including the 3x multiplier)		
3	All portfolios subject to the Standardized CVA capital Charge	82,571	14,997
4	**Total subject to the CVA capital charge**	**82,571**	**14,997**

[1] Effective Q1 2019, OSFI has allowed a 0.7 scalar to be applied to the exposure amount determined under SA-CCR for the purpose of determining CVA.

CCR3: Standardized approach – CCR exposures by regulatory portfolio and risk weights

The following table presents a breakdown of counterparty credit risk exposures calculated according to the standardized approach by portfolio and risk weight.

As at October 31, 2022

	a	b	c	d	e	f	g	h	i
Regulatory portfolio (Millions of Canadian dollars) / Risk weight	0%	10%	20%	50%	75%	100%	150%	Others	Total credit exposure
Sovereigns	-	-	-	-	-	-	-	-	-
Non-central government public sector entities (PSEs)	-	-	-	-	-	3	-	-	3
Multilateral development banks (MDBs)	-	-	-	-	-	-	-	-	-
Banks	-	-	-	-	-	61	-	-	61
Securities firms	-	-	-	-	-	31	-	-	31
Corporates	-	-	91	-	-	2,187	-	-	2,278
Regulatory retail portfolios	-	-	-	-	-	-	-	-	-
Other assets	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**91**	**-**	**-**	**2,282**	**-**	**-**	**2,373**

As at July 31, 2022

	a	b	c	d	e	f	g	h	i
Regulatory portfolio (Millions of Canadian dollars) / Risk weight	0%	10%	20%	50%	75%	100%	150%	Others	Total credit exposure
Sovereigns	-	-	-	-	-	-	-	-	-
Non-central government public sector entities (PSEs)	-	-	-	-	-	9	-	-	9
Multilateral development banks (MDBs)	-	-	-	-	-	-	-	-	-
Banks	-	-	-	-	-	36	-	-	36
Securities firms	-	-	3	-	-	45	-	-	48
Corporates	-	-	68	-	-	1,324	-	-	1,392
Regulatory retail portfolios	-	-	-	-	-	-	-	-	-
Other assets	-	-	-	-	-	-	-	-	-
Total	**-**	**-**	**71**	**-**	**-**	**1,414**	**-**	**-**	**1,485**

CCR4: IRB – CCR exposures by portfolio and PD scale

The following table presents a detailed view of CCR exposures subject to IRB approach by asset classes and PD scale.

As at October 31, 2022

		a	b	c	d	e	f	g
(Millions of Canadian dollars, except as otherwise noted)	PD scale[1]	EAD post-CRM	Average PD (%)	Number of obligors	Average LGD (%)	Average maturity (in years)	RWA	RWA density (%)
Asset classes								
Sovereigns	0.00 to < 0.15	36,912	0.04	318	14.57	1.45	1,723	4.7
	0.15 to < 0.25	91	0.24	12	44.02	1.34	36	39.4
	0.25 to < 0.50	18	0.50	4	37.09	1.00	8	45.4
	0.50 to < 0.75	-	-	-	-	-	-	-
	0.75 to < 2.50	8	1.85	5	45.00	1.28	10	123.5
	2.50 to < 10.00	-	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-	-
Total sovereigns		**37,029**	**0.04**	**339**	**14.66**	**1.45**	**1,777**	**4.8**
Banks								
	0.00 to < 0.15	119,693	0.06	303	13.09	0.70	6,421	5.4
	0.15 to < 0.25	309	0.24	19	39.52	2.23	137	44.2
	0.25 to < 0.50	2,124	0.50	21	4.72	0.56	131	6.2
	0.50 to < 0.75	-	-	-	-	-	-	-
	0.75 to < 2.50	641	1.16	29	25.43	0.70	325	50.7
	2.50 to < 10.00	-	2.74	3	45.00	2.85	-	151.2
	10.00 to < 100.00	-	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-	-
Total banks		**122,767**	**0.08**	**375**	**13.08**	**0.70**	**7,014**	**5.7**
Corporates								
	0.00 to < 0.15	110,893	0.06	8,668	34.38	0.84	14,806	13.4
	0.15 to < 0.25	3,479	0.24	562	40.92	1.14	1,396	40.1
	0.25 to < 0.50	1,666	0.50	299	39.00	1.48	938	56.3
	0.50 to < 0.75	-	-	-	-	-	-	-
	0.75 to < 2.50	6,144	1.37	653	36.31	1.61	4,835	78.7
	2.50 to < 10.00	674	3.00	196	49.95	3.38	1,120	166.2
	10.00 to < 100.00	18	19.21	11	44.98	1.16	43	231.8
	100.00 (default)	-	100.00	1	45.00	1.00	2	596.3
Total corporates		**122,874**	**0.16**	**10,390**	**34.81**	**0.91**	**23,140**	**18.8**
Total		**282,670**	**0.08**	**11,104**	**22.73**	**0.89**	**31,931**	**11.3**

[1] Refer to "Internal ratings map" in the Credit risk assessment section in our 2022 Annual Report MD&A.

CCR4: IRB – CCR exposures by portfolio and PD scale (continued)

As at July 31, 2022

(Millions of Canadian dollars, except as otherwise noted)	PD scale[1]	a EAD post-CRM	b Average PD (%)	c Number of obligors	d Average LGD (%)	e Average maturity (in years)	f RWA	g RWA density (%)
Asset classes								
Sovereigns	0.00 to < 0.15	37,059	0.04	321	13.17	1.25	1,712	4.6
	0.15 to < 0.25	113	0.24	11	44.38	1.13	41	36.4
	0.25 to < 0.50	26	0.50	6	36.67	3.19	20	79.7
	0.50 to < 0.75	-	-	-	-	-	-	-
	0.75 to < 2.50	5	1.54	4	45.00	1.94	6	115.4
	2.50 to < 10.00	-	-	-	-	-	-	-
	10.00 to < 100.00	-	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-	-
Total sovereigns		**37,203**	**0.04**	**342**	**13.29**	**1.25**	**1,779**	**4.8**
Banks								
	0.00 to < 0.15	129,610	0.06	298	11.21	0.69	6,105	4.7
	0.15 to < 0.25	358	0.24	23	30.76	2.01	152	42.4
	0.25 to < 0.50	2,546	0.50	23	3.70	0.57	132	5.2
	0.50 to < 0.75	-	-	-	-	-	-	-
	0.75 to < 2.50	544	0.98	27	11.65	0.62	118	21.6
	2.50 to < 10.00	29	2.83	5	45.00	1.14	33	117.1
	10.00 to < 100.00	-	-	-	-	-	-	-
	100.00 (default)	-	-	-	-	-	-	-
Total banks		**133,087**	**0.08**	**376**	**11.13**	**0.69**	**6,540**	**4.9**
Corporates								
	0.00 to < 0.15	100,655	0.06	8,553	34.77	0.82	13,327	13.2
	0.15 to < 0.25	4,144	0.24	580	38.90	1.26	1,596	38.5
	0.25 to < 0.50	1,869	0.50	305	38.20	1.74	1,082	57.9
	0.50 to < 0.75	-	-	-	-	-	-	-
	0.75 to < 2.50	8,794	1.38	657	35.42	1.51	6,681	76.0
	2.50 to < 10.00	885	3.07	203	47.20	2.66	1,333	150.6
	10.00 to < 100.00	17	19.21	8	44.45	1.48	41	233.1
	100.00 (default)	-	100.00	1	40.00	1.00	1	530.0
Total corporates		**116,364**	**0.20**	**10,307**	**35.12**	**0.91**	**24,061**	**20.7**
Total		**286,654**	**0.07**	**11,025**	**21.15**	**0.85**	**32,380**	**11.3**

[1] Refer to “Internal ratings map” in the Credit risk assessment section in our 2021 Annual Report MD&A.

CCR5: Composition of collateral for CCR exposure

The following table presents a breakdown of collateral posted or received to support or reduce the CCR exposures related to derivative transactions or securities financing transactions (SFTs), including transactions cleared through a central counterparty clearing house (CCP).

As at October 31, 2022

	a	b	c	d	e	f
	Collateral used in derivative transactions				Collateral used in SFTs	
	Fair value of collateral received		Fair value of posted collateral		Fair value of collateral received	Fair value of posted collateral
(Millions of Canadian dollars)	Segregated	Unsegregated	Segregated	Unsegregated		
Cash - domestic currency	385	4,261	693	1,565	43,941	62,710
Cash - other currencies	6,634	19,456	14,598	28,798	325,277	338,600
Domestic sovereign debt	540	2,902	3,100	420	139,312	135,716
Other sovereign debt	4,378	1,885	5,149	1,258	253,649	246,708
Government agency debt	1,077	588	328	1,831	70,701	85,222
Corporate bonds	1,041	775	1,244	-	36,292	37,113
Equity securities	926	-	1,204	3,764	109,766	145,957
Other collateral	-	35	-	-	26,816	8,141
Total	**14,981**	**29,902**	**26,316**	**37,636**	**1,005,754**	**1,060,167**

As at April 30, 2022

	a	b	c	d	e	f
	Collateral used in derivative transactions				Collateral used in SFTs	
	Fair value of collateral received		Fair value of posted collateral		Fair value of collateral received	Fair value of posted collateral
(Millions of Canadian dollars)	Segregated	Unsegregated	Segregated	Unsegregated		
Cash - domestic currency	281	4,917	520	1,079	50,948	51,065
Cash - other currencies	5,456	20,673	14,618	29,457	299,979	336,729
Domestic sovereign debt	1,515	1,934	2,357	460	135,586	151,245
Other sovereign debt	3,359	1,883	4,128	1,438	272,001	246,878
Government agency debt	44	905	124	1,649	55,655	56,273
Corporate bonds	793	495	337	3	33,271	37,322
Equity securities	588	-	1,259	3,309	116,352	167,030
Other collateral	-	19	-	-	27,868	8,862
Total	**12,036**	**30,826**	**23,343**	**37,395**	**991,660**	**1,055,404**

CCR6: Credit derivatives exposures

The following table presents credit derivatives bought or sold by notional and fair values.

As at October 31, 2022

	a	b
(Millions of Canadian dollars)	Protection bought	Protection sold
Notionals		
Single-name credit default swaps	8,740	11,595
Index credit default swaps	15,620	5,802
Total return swaps	-	-
Credit options	1,758	-
Other credit derivatives	-	-
Total notionals	**26,118**	**17,397**
Fair values		
Positive fair value (asset)	118	296
Negative fair value (liability)	23	103

As at July 31, 2022

	a	b
(Millions of Canadian dollars)	Protection bought	Protection sold
Notionals		
Single-name credit default swaps	8,707	9,196
Index credit default swaps	14,164	6,686
Total return swaps	-	-
Credit options	4,264	1,025
Other credit derivatives	-	-
Total notionals	**27,135**	**16,907**
Fair values		
Positive fair value (asset)	69	288
Negative fair value (liability)	26	96

CCR7: RWA flow statements of CCR exposures under the Internal Model Method (IMM)

We currently do not apply the IMM to our counterparty credit risk exposures.

CCR8: Exposures to central counterparties

The following table presents a comprehensive view of our exposures to central counterparty clearing houses (CCPs), including due to operations, margins and contributions to default funds, and related RWA.

As at October 31, 2022

(Millions of Canadian dollars)		a EAD (post-CRM)	b RWA
1	**Exposures to QCCPs (total)**	**53,469**	**699**
2	Exposures for trades at QCCPs (excluding initial margin and default fund contributions); of which	32,616	671
3	(i) OTC derivatives	8,090	181
4	(ii) Exchange-traded derivatives	19,870	397
5	(iii) Securities financing transactions	4,656	93
6	(iv) Netting sets where cross-product netting has been approved	-	-
7	Segregated initial margin	8,420	
8	Non-segregated initial margin	5,478	-
9	Pre-funded default fund contributions	1,479	28
10	Unfunded default fund contributions[1]	5,476	-
11	**Exposures to non-QCCPs (total)**		
12	Exposures for trades at non-QCCPs (excluding initial margin and default fund contributions); of which		
13	(i) OTC derivatives		
14	(ii) Exchange-traded derivatives		
15	(iii) Securities financing transactions		
16	(iv) Netting sets where cross-product netting has been approved		
17	Segregated initial margin		
18	Non-segregated initial margin		
19	Pre-funded default fund contributions		
20	Unfunded default fund contributions		

[1] Unfunded default fund contributions are risk weighted at 0%.

CCR8: Exposures to central counterparties (continued)

As at July 31, 2022

	(Millions of Canadian dollars)	a EAD (post-CRM)	b RWA
1	**Exposures to QCCPs (total)**	**36,173**	**409**
2	Exposures for trades at QCCPs (excluding initial margin and default fund contributions); of which	15,590	372
3	(i) OTC derivatives	6,005	181
4	(ii) Exchange-traded derivatives	6,430	128
5	(iii) Securities financing transactions	3,155	63
6	(iv) Netting sets where cross-product netting has been approved	-	-
7	Segregated initial margin	8,507	
8	Non-segregated initial margin	5,545	-
9	Pre-funded default fund contributions	1,560	37
10	Unfunded default fund contributions[1]	4,971	-
11	**Exposures to non-QCCPs (total)**		
12	Exposures for trades at non-QCCPs (excluding initial margin and default fund contributions); of which		
13	(i) OTC derivatives		
14	(ii) Exchange-traded derivatives		
15	(iii) Securities financing transactions		
16	(iv) Netting sets where cross-product netting has been approved		
17	Segregated initial margin		
18	Non-segregated initial margin		
19	Pre-funded default fund contributions		
20	Unfunded default fund contributions		

[1] Unfunded default fund contributions are risk weighted at 0%.

SECURITIZATION

SECA: Qualitative disclosure requirements related to securitization exposures

The table below presents an overview of Pillar 3 disclosure requirements that have been met within our 2022 Annual Report and incorporated by reference into this Pillar 3 report. Our 2022 Annual Report is available free of charge on our website at http://www.rbc.com/investorrelations

Pillar 3 disclosures requirement		2022 Annual Report section	Sub-section
a)	Objectives in relation to securitization activities	Off-balance sheet arrangements	Off-balance sheet arrangements
		Consolidated Financial Statements	Note 7 - Derecognition of financial assets
		Consolidated Financial Statements	Note 8 - Structured entities
b)	List of SPEs where RBC is sponsor / provides implicit support	Consolidated Financial Statements	Note 8 - Structured entities
c)	Accounting policies for securitization	Consolidated Financial Statements	Note 2 - Summary of significant accounting policies, estimates and judgments - Basis of consolidation - Derecognition of financial assets
		Critical accounting policies and estimates	Consolidation of structured entities
d)	The names of external credit assessment institution (ECAIs) used for securitizations and the types of securitization exposure for which each agency is used	Capital management (also refer to CRD in this document)	Regulatory capital approach for securitization exposures
e)	Use of Basel IAA for capital purposes	Credit risk	n/a
		Capital management	Regulatory capital approach for securitization exposures
f)	Use of other internal assessment for capital purposes	Credit risk	Credit risk assessment

SEC1: IRB – Securitization exposures in the banking book

The following table presents the breakdown of our balance sheet banking book carrying values by our role and type.

As at October 31, 2022

		a	b	c	e	f	g	i	j	k
		Bank acts as originator[1]			Bank acts as sponsor[2]			Bank acts as investor[3]		
(Millions of Canadian dollars)		Traditional	Synthetic	Sub-total	Traditional	Synthetic	Sub-total	Traditional	Synthetic	Sub-total
1	**Retail (total) - of which**	**-**	**-**	**-**	**44,531**	**-**	**44,531**	**361**	**-**	**361**
2	residential mortgage	-	-	-	3,583	-	3,583	3	-	3
3	credit card	-	-	-	9,372	-	9,372	-	-	-
4	other retail exposures	-	-	-	31,576	-	31,576	358	-	358
4a	of which student loans	-	-	-	3,325	-	3,325	285	-	285
4b	of which auto loans and leases	-	-	-	20,525	-	20,525	73	-	73
4c	of which consumer loans	-	-	-	7,726	-	7,726	-	-	-
4d	of which other retail	-	-	-	-	-	-	-	-	-
5	re-securitization	-	-	-	-	-	-	-	-	-
6	**Wholesale (total) – of which**	**-**	**-**	**-**	**18,169**	**-**	**18,169**	**11,778**	**-**	**11,778**
7	loans to corporates	-	-	-	3,040	-	3,040	10,390	-	10,390
8	commercial mortgage	-	-	-	-	-	-	79	-	79
9	lease and receivables	-	-	-	-	-	-	-	-	-
10	other wholesale	-	-	-	15,129	-	15,129	1,309	-	1,309
10a	of which dealer floor plan receivable	-	-	-	2,151	-	2,151	-	-	-
10b	of which equipment receivable	-	-	-	4,711	-	4,711	-	-	-
10c	of which trade receivable	-	-	-	263	-	263	-	-	-
10d	of which other wholesale	-	-	-	8,004	-	8,004	1,309	-	1,309
11	re-securitization	-	-	-	-	-	-	-	-	-

[1] Bank acts as originator reflects securitization activities in which we securitize our own assets (e.g. Golden credit card securitization).

[2] Bank acts as sponsor reflects securitization activities in which RBC works with its client to originate securitization transactions. RBC provides the liquidity and credit enhancement facilities to the SPE.

[3] Bank acts as investor reflects purchases of securitization assets from the market.

SEC1: IRB – Securitization exposures in the banking book (continued)

As at July 31, 2022

		a	b	c	e	f	g	i	j	k
		Bank acts as originator[1]			Bank acts as sponsor[2]			Bank acts as investor[3]		
(Millions of Canadian dollars)		Traditional	Synthetic	Sub-total	Traditional	Synthetic	Sub-total	Traditional	Synthetic	Sub-total
1	**Retail (total) - of which**	**-**	**-**	**-**	**41,765**	**-**	**41,765**	**356**	**-**	**356**
2	residential mortgage	-	-	-	3,328	-	3,328	3	-	3
3	credit card	-	-	-	7,561	-	7,561	-	-	-
4	other retail exposures	-	-	-	30,876	-	30,876	353	-	353
4a	of which student loans	-	-	-	3,364	-	3,364	285	-	285
4b	of which auto loans and leases	-	-	-	20,416	-	20,416	68	-	68
4c	of which consumer loans	-	-	-	7,095	-	7,095	-	-	-
4d	of which other retail	-	-	-	1	-	1	-	-	-
5	re-securitization	-	-	-	-	-	-	-	-	-
6	**Wholesale (total) – of which**	**-**	**-**	**-**	**17,618**	**-**	**17,618**	**10,945**	**-**	**10,945**
7	loans to corporates	-	-	-	2,998	-	2,998	9,662	-	9,662
8	commercial mortgage	-	-	-	-	-	-	74	-	74
9	lease and receivables	-	-	-	-	-	-	-	-	-
10	other wholesale	-	-	-	14,620	-	14,620	1,209	-	1,209
10a	of which dealer floor plan receivable	-	-	-	1,943	-	1,943	-	-	-
10b	of which equipment receivable	-	-	-	4,382	-	4,382	-	-	-
10c	of which trade receivable	-	-	-	262	-	262	-	-	-
10d	of which other wholesale	-	-	-	8,033	-	8,033	1,209	-	1,209
11	re-securitization	-	-	-	-	-	-	-	-	-

[1] Bank acts as originator reflects securitization activities in which we securitize our own assets (e.g. Golden credit card securitization).

[2] Bank acts as sponsor reflects securitization activities in which RBC works with its client to originate securitization transactions. RBC provides the liquidity and credit enhancement facilities to the SPE.

[3] Bank acts as investor reflects purchases of securitization assets from the market.

SEC2: IRB – Securitization exposures in the trading book

The following table presents the breakdown of our balance sheet trading book carrying values by our role and type.

As at October 31, 2022

		a	b	c	e	f	g	i	j	k
		Bank acts as originator[1]			Bank acts as sponsor[2]			Bank acts as investor[3]		
	(Millions of Canadian dollars)	Traditional	Synthetic	Sub-total	Traditional	Synthetic	Sub-total	Traditional	Synthetic	Sub-total
1	**Retail (total) - of which**	**-**	**-**	**-**	**-**	**-**	**-**	**300**	**-**	**300**
2	residential mortgages	-	-	-	-	-	-	7	-	7
3	credit cards	-	-	-	-	-	-	17	-	17
4	other retail exposures	-	-	-	-	-	-	276	-	276
4a	of which student loans	-	-	-	-	-	-	101	-	101
4b	of which auto loans and leases	-	-	-	-	-	-	149	-	149
4c	of which consumer loans	-	-	-	-	-	-	26	-	26
4d	of which other retail	-	-	-	-	-	-	-	-	-
5	re-securitization	-	-	-	-	-	-	-	-	-
6	**Wholesale (total) - of which**	**-**	**-**	**-**	**-**	**-**	**-**	**5,885**	**-**	**5,885**
7	loans to corporates	-	-	-	-	-	-	239	-	239
8	commercial mortgages	-	-	-	-	-	-	4,245	-	4,245
9	leases and receivables	-	-	-	-	-	-	-	-	-
10	other wholesale exposures	-	-	-	-	-	-	1,401	-	1,401
10a	of which dealer floor plan receivables	-	-	-	-	-	-	-	-	-
10b	of which equipment receivables	-	-	-	-	-	-	7	-	7
10c	of which trade receivables	-	-	-	-	-	-	-	-	-
10d	of which other wholesale	-	-	-	-	-	-	1,394	-	1,394
11	re-securitization	-	-	-	-	-	-	-	-	-

[1] Bank acts as originator reflects securitization activities in which we securitize our own assets.

[2] Bank acts as sponsor reflects securitization activities in which RBC works with its client to originate securitization transactions. RBC provides the liquidity and credit enhancement facilities to the SPE.

[3] Bank acts as investor reflects purchases of securitization assets from the market.

Commercial Mortgage exposures decreased due to lower Commercial Mortgage Backed Security inventories amidst unfavourable market conditions.

SEC2: IRB – Securitization exposures in the trading book (continued)

As at July 31, 2022

		a	b	c	e	f	g	i	j	k
		Bank acts as originator[1]			Bank acts as sponsor[2]			Bank acts as investor[3]		
	(Millions of Canadian dollars)	Traditional	Synthetic	Sub-total	Traditional	Synthetic	Sub-total	Traditional	Synthetic	Sub-total
1	**Retail (total) - of which**	**-**	**-**	**-**	**-**	**-**	**-**	**243**	**-**	**243**
2	residential mortgages	-	-	-	-	-	-	5	-	5
3	credit cards	-	-	-	-	-	-	39	-	39
4	other retail exposures	-	-	-	-	-	-	199	-	199
4a	of which student loans	-	-	-	-	-	-	47	-	47
4b	of which auto loans and leases	-	-	-	-	-	-	139	-	139
4c	of which consumer loans	-	-	-	-	-	-	13	-	13
4d	of which other retail	-	-	-	-	-	-	-	-	-
5	re-securitization	-	-	-	-	-	-	-	-	-
6	**Wholesale (total) - of which**	**-**	**-**	**-**	**-**	**-**	**-**	**6,019**	**-**	**6,019**
7	loans to corporates	-	-	-	-	-	-	163	-	163
8	commercial mortgages	-	-	-	-	-	-	4,784	-	4,784
9	leases and receivables	-	-	-	-	-	-	-	-	-
10	other wholesale exposures	-	-	-	-	-	-	1,072	-	1,072
10a	of which dealer floor plan receivables	-	-	-	-	-	-	2	-	2
10b	of which equipment receivables	-	-	-	-	-	-	20	-	20
10c	of which trade receivables	-	-	-	-	-	-	-	-	-
10d	of which other wholesale	-	-	-	-	-	-	1,050	-	1,050
11	re-securitization	-	-	-	-	-	-	-	-	-

[1] Bank acts as originator reflects securitization activities in which we securitize our own assets.

[2] Bank acts as sponsor reflects securitization activities in which RBC works with its client to originate securitization transactions. RBC provides the liquidity and credit enhancement facilities to the SPE.

[3] Bank acts as investor reflects purchases of securitization assets from the market.

SEC3: Securitization exposures in the banking book and associated regulatory capital requirements – bank acting as originator or as sponsor

The following table presents a breakdown of securitization exposures in the banking book by risk weight and by regulatory approach when we act as originator or sponsor, and the associated capital requirements.

As at October 31, 2022

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
		Exposure values (by RW bands)					Exposure values (by regulatory approach)				RWA[3] (by regulatory approach)				Capital charge after cap (by regulatory approach)			
	(Millions of Canadian dollars)	≤20% RW	>20% to 50% RW	>50% to 100% RW	>100% to <1250% RW	1250% RW	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%
1	**Total exposures**	**56,277**	**4,503**	**1,365**	**555**	**-**	**-**	**50,131**	**12,569**	**-**	**-**	**7,036**	**2,741**	**-**	**-**	**562**	**219**	**-**
2	Traditional securitization	56,277	4,503	1,365	555	-	-	50,131	12,569	-	-	7,036	2,741	-	-	562	219	-
3	Of which securitization	56,277	4,503	1,365	555	-	-	50,131	12,569	-	-	7,036	2,741	-	-	562	219	-
4	Of which retail underlying	41,712	2,286	173	360	-	-	38,738	5,793	-	-	5,244	815	-	-	420	65	-
5	Of which wholesale	14,565	2,217	1,192	195	-	-	11,393	6,776	-	-	1,792	1,926	-	-	142	154	-
6	Of which re-securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Of which senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Of which non-senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Synthetic securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Of which securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Of which retail underlying	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Of which wholesale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Of which re-securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Of which senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Of which non-senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[1] OSFI adopted BCBS Revised Securitization Framework in Q1 2019. Effective Q1 2020, transitional grandfathering is no longer allowed.

[2] As per disclosure requirements Internal assessment approach (IAA) exposures have been included with securitization external rating based approach.

[3] Under the revised securitization framework, OSFI has removed the 1.06% IRB scalar for securitization exposures not risk weighted at 1250%.

[4] SEC-IRBA exposures reflect exposures where we have underlying IRB approval currently.

As at July 31, 2022

(Millions of Canadian dollars)		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
		Exposure values (by RW bands)					Exposure values (by regulatory approach)				RWA[3] (by regulatory approach)				Capital charge after cap (by regulatory approach)			
		≤20% RW	>20% to 50% RW	>50% to 100% RW	>100% to <1250% RW	1250% RW	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%
1	**Total exposures**	**53,430**	**3,948**	**1,406**	**599**	**-**	**-**	**47,989**	**11,394**	**-**	**-**	**6,665**	**2,654**	**-**	**-**	**533**	**212**	**-**
2	Traditional securitization	53,430	3,948	1,406	599	-	-	47,989	11,394	-	-	6,665	2,654	-	-	533	212	-
3	Of which securitization	53,430	3,948	1,406	599	-	-	47,989	11,394	-	-	6,665	2,654	-	-	533	212	-
4	Of which retail underlying	39,289	2,153	156	166	-	-	36,306	5,458	-	-	4,611	755	-	-	369	60	-
5	Of which wholesale	14,141	1,795	1,250	433	-	-	11,683	5,936	-	-	2,054	1,899	-	-	164	152	-
6	Of which re-securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Of which senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Of which non-senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Synthetic securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Of which securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Of which retail underlying	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Of which wholesale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Of which re-securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Of which senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Of which non-senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[1] OSFI adopted BCBS Revised Securitization Framework in Q1 2019. Effective Q1 2020, transitional grandfathering is no longer allowed.

[2] As per disclosure requirements Internal assessment approach (IAA) exposures have been included with securitization external rating based approach.

[3] Under the revised securitization framework, OSFI has removed the 1.06% IRB scalar for securitization exposures not risk weighted at 1250%.

[4] SEC-IRBA exposures reflect exposures where we have underlying IRB approval currently.

SEC4: Securitization exposures in the banking book and associated capital requirements – bank acting as investor

The following table presents a breakdown of securitization exposures in the banking book by risk weight and by regulatory approach when we act as investor, and the associated capital requirements.

As at October 31, 2022

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
		Exposure values (by RW bands)					Exposure values (by regulatory approach)				RWA[3] (by regulatory approach)				Capital charge after cap (by regulatory approach)			
	(Millions of Canadian dollars)	≤20% RW	>20% to 50% RW	>50% to 100% RW	>100% to <1250% RW	1250% RW	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%
1	**Total exposures**	**11,844**	**220**	**34**	**23**	**18**	**-**	**12,121**	**-**	**18**	**-**	**2,534**	**-**	**232**	**-**	**203**	**-**	**19**
2	Traditional securitization	11,844	220	34	23	18	-	12,121	-	18	-	2,534	-	232	-	203	-	19
3	Of which securitization	11,844	220	34	23	18	-	12,121	-	18	-	2,534	-	232	-	203	-	19
4	Of which retail underlying	310	49	-	2	-	-	361	-	-	-	82	-	-	-	7	-	-
5	Of which wholesale	11,534	171	34	21	18	-	11,760	-	18	-	2,452	-	232	-	196	-	19
6	Of which re-securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Of which senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Of which non-senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Synthetic securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Of which securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Of which retail underlying	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Of which wholesale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Of which re-securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Of which senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Of which non-senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[1] OSFI adopted BCBS Revised Securitization Framework in Q1 2019. Effective Q1 2020, transitional grandfathering is no longer allowed.
[2] As per disclosure requirements Internal assessment approach (IAA) exposures have been included with securitization external rating based approach.
[3] Under the revised securitization framework, OSFI has removed the 1.06% IRB scalar for securitization exposures not risk weighted at 1,250%.
[4] SEC-IRBA exposures reflect exposures where we have underlying IRB approval currently.

As at July 31, 2022

		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q
		Exposure values (by RW bands)					Exposure values (by regulatory approach)				RWA[3] (by regulatory approach)				Capital charge after cap (by regulatory approach)			
(Millions of Canadian dollars)		≤20% RW	>20% to 50% RW	>50% to 100% RW	>100% to <1250% RW	1250% RW	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%	SEC – IRBA[1,4]	SEC – ERBA[1,2]	SEC – SA[1]	1250%
1	**Total exposures**	**11,101**	**146**	**25**	**11**	**18**	**-**	**11,283**	**-**	**18**	**-**	**2,353**	**-**	**225**	**-**	**188**	**-**	**18**
2	Traditional securitization	11,101	146	25	11	18	-	11,283	-	18	-	2,353	-	225	-	188	-	18
3	Of which securitization	11,101	146	25	11	18	-	11,283	-	18	-	2,353	-	225	-	188	-	18
4	Of which retail underlying	283	72	-	2	-	-	357	-	-	-	85	-	-	-	7	-	-
5	Of which wholesale	10,818	74	25	9	18	-	10,926	-	18	-	2,268	-	225	-	181	-	18
6	Of which re-securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Of which senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Of which non-senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Synthetic securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Of which securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Of which retail underlying	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	Of which wholesale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Of which re-securitization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Of which senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	Of which non-senior	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

[1] OSFI adopted BCBS Revised Securitization Framework in Q1 2019. Effective Q1 2020, transitional grandfathering is no longer allowed.

[2] As per disclosure requirements Internal assessment approach (IAA) exposures have been included with securitization external rating based approach.

[3] Under the revised securitization framework, OSFI has removed the 1.06% IRB scalar for securitization exposures not risk weighted at 1,250%.

[4] SEC-IRBA exposures reflect exposures where we have underlying IRB approval currently.

MARKET RISK

MRA: Qualitative disclosure requirements related to market risk

Market risk management strategies and processes

Market risk arises from our trading and non-trading portfolios. The primary objective of trading is to generate an optimal return on our capital while ensuring that risks remain within our risk appetite. Trading activities involve market making, facilitating client transactions and hedging risks generated from these activities.

Market risk also arises from our non-trading portfolio as a result of managing interest rate risk from client-originating banking products (such as loans and deposits) and related hedge transactions, portfolios used for asset-liability management and liquidity management, exposures designated as FVOCI, and exposures from our insurance operations.

To ensure that market risk remains within our risk appetite, we hedge our market risk exposures where appropriate. We use cash and derivative financial instruments, as permitted by regulatory and jurisdictional requirements, to manage the market risk related to our trading and non-trading activities.

The table below presents an overview of Pillar 3 disclosure requirements that have been met within our 2022 Annual Report and incorporated by reference into this Pillar 3 report. Our 2022 Annual Report is available free of charge on our website at http://www.rbc.com/investorrelations

<table>
<tr><th colspan="2">Pillar 3 disclosures requirement</th><th>2022 Annual Report section</th><th>Sub-Section</th></tr>
<tr><td rowspan="9">a)</td><td rowspan="8">Processes implemented to identify, measure, monitor and control the bank's market risks</td><td rowspan="8">Market Risk</td><td>Market risk controls – FVTPL positions</td></tr>
<tr><td>Stress tests</td></tr>
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<tr><td>Policies for hedging risk and strategies/processes for monitoring the continuing effectiveness of hedges</td><td>Consolidated Financial Statements</td><td>Note 2 - Summary of significant accounting policies, estimates and judgements – Hedge accounting</td></tr>
</table>

MRA: Qualitative disclosure requirements related to market risk (continued)

Market risk management structure and organization

The Enterprise Market Risk Management Framework is the governance and control framework for the management of market risk within the bank. The market risk management structure is designed to ensure strong corporate governance over all market risk in the context of each business considering operating environment, industry best practices, and regulatory requirements. Drivers of market risk are considered in the bank's policies, practices and standards which are continuously updated given dynamic market and regulatory conditions.

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Pillar 3 disclosures requirement		2022 Annual Report section	Sub-Section
b)	Description of the market risk governance structure established to implement the strategies and processes of the bank	Enterprise Risk Management	Risk governance
			Risk appetite
			Risk measurement
			Risk control
			Risk measurement - *Stress testing*
			Culture and conduct risk
	Description of the relationships and the communication mechanisms between the different parties involved in market risk management	Enterprise Risk Management	Risk governance
			Risk control

Scope and nature of risk reporting and/or measurement systems

The table below presents an overview of Pillar 3 disclosure requirements that have been met within our 2022 Annual Report and incorporated by reference into this Pillar 3 report. Our 2022 Annual Report is available free of charge on our website at http://www.rbc.com/investorrelations

Pillar 3 disclosures requirement		2022 Annual Report section	Sub-Section
c)	Scope and nature of risk reporting and/or measurement systems	Enterprise Risk Management	Risk measurement
			Risk control
			Risk measurement – *Stress testing*
		Market Risk	Market risk controls – FVTPL positions
			Stress tests
			Market risk measures – FVTPL positions
			Market risk measures for assets and liabilities of RBC Insurance
			Market risk controls – Interest Rate Risk in the Banking Book (IRRBB) positions
			IRRBB measurement
			Market risk measures – IRRBB Sensitivities
			Market risk measures for other material non-trading portfolios

MRB: Qualitative disclosures for banks using the Internal Models Approach (IMA)

Internal models used for measuring Market Risk

Measure	Description	Percentage of market risk regulatory capital[1]
Regulatory Value at Risk (VaR)	VaR is a statistical measure of potential loss for a financial portfolio computed at a given level of confidence and over a defined holding period. We measure VaR at the 99th percentile confidence level and for regulatory capital measurement we take the more conservative of the one-day holding period scaled up to a ten-day holding period or the direct ten-day holding period. The measure is computed daily, using a full-revaluation approach to generate potential profit or loss values arising from historically observed daily market movements. The historical period used to compute VaR is comprised of the recent two years of equally weighted market data, and is rolled forward on a weekly basis. A mix of absolute and relative returns are used in generating the historical market changes.	7%
Stressed VaR (SVaR)	SVaR is calculated daily in a similar manner as VaR, but based on a ten-day holding period directly and using a one year period of heightened volatility. We currently use the historical period between 2019 and 2020 covering the market volatility observed during Q2 2020. This historical period chosen reflects the one year period of greatest potential loss for our portfolio.	32%
Incremental Risk Charge (IRC)	IRC captures the risk of losses under default or rating changes for issuers of traded instruments. IRC is measured over a one-year horizon at a 99.9% confidence level, and captures different liquidity horizons for instruments and concentrations in issuers under a constant level of risk assumption.	12%

[1] As at October 31, 2022.

VaR and SVaR

The VaR and SVaR models are used for computing regulatory capital for trading book positions across the enterprise, where we have obtained approval from our regulator. We model a general market risk measure, a debt specific risk measure, and an equity total risk measure; along with a total correlated risk measure which combines the above distributions. For portions of our portfolio for which we do not have regulatory approval for models based capital, we use the Standardized Approach to compute regulatory capital.

For management purposes, VaR and SVaR are both computed with one-day holding periods and are applied to all positions that impact the bank's revenue across the trading book and non-trading book. A sensitivity-ladder interpolation approach is applied for some positions instead of full-revaluation, and inactive non-trading book positions are refreshed monthly.

The table below presents an overview of Pillar 3 disclosure requirements that have been met within our 2022 Annual Report and incorporated by reference into this Pillar 3 report. Our 2022 Annual Report is available free of charge on our website at http://www.rbc.com/investorrelations

Pillar 3 disclosures requirement		2022 Annual Report section	Sub-Section
c)	General description of the models (VaR/stressed VaR)	Market Risk	Market Risk Controls – FVTPL positions
g)	Description of stress testing applied to the modelling parameters	Market Risk	Stress tests

The VaR and SVaR models are governed by our model risk governance framework, which requires that models are validated on a regular basis by a model validation group that is independent of the model developers. The VaR and SVaR models are also subject to ongoing model performance monitoring. The VaR model is back tested by comparing changes in the mark-to-market amounts to the computed VaR on a daily basis, in order to ensure that actual outcomes in trading revenue do not exceed the VaR projections beyond the expectations of the applied confidence interval. Backtesting is also performed using a hypothetical profit and loss calculation which allows for comparisons to the total correlated VaR, the general market risk VaR, and asset class VaR measures separately.

While the majority of market risks are reflected in our VaR models, there is the potential for certain risks to be inadequately captured. This can occur due to infrastructure limitations, lack of historical market data or missing risk factors within our VaR models. These Risks Not in VaR (RNIV) are identified through backtesting and other model monitoring processes, and are incorporated into the VaR models, where possible. An assessment of residual RNIV materiality is reviewed and monitored against thresholds at least quarterly.

MRB: Qualitative disclosures for banks using the Internal Models Approach (continued)

Incremental Risk Charge

Our IRC model is applied to debt instruments, credit products, and credit derivatives within our trading portfolios. A probability modelling technique known as the Monte Carlo simulation process is used to generate a statistically relevant number of loss scenarios due to issuer ratings migration and default in order to establish the losses at that confidence level. These scenarios are determined using a transition probability matrix which is calibrated using recent 20 years of historical issuer ratings migration and default observations. Correlations between issuer regions and sectors are calibrated using eight years of historical equity time series data. For the Monte Carlo process, each position is assigned a liquidity horizon (the length of time to close out a position) of three months, six months, or one year, depending on its issuer type, credit rating, and maturity profile.

The IRC model is also subject to the same independent vetting, validation procedures and model risk governance framework as the VaR and SVaR models. Model performance monitoring includes reviews and stress testing of model assumptions, which includes stress testing the historical correlation and liquidity assumptions. Due to the long time horizon and high confidence level of the risk measure, we do not perform backtesting of the IRC model as we do for the VaR measure.

MR1: Market risk under standardized approach

The following table presents the components of the capital requirement under the standardized approach for market risk.

		RWA	
	(Millions of Canadian dollars)	As at October 31, 2022	As at July 31, 2022
	Outright products		
1	Interest rate risk (general and specific)	4,714	4,949
2	Equity risk (general and specific)	552	1,035
3	Foreign exchange risk	2,884	2,356
4	Commodity risk	1,630	2,500
	Options		
5	Simplified approach	-	-
6	Delta-plus method	-	-
7	Scenario approach	5,686	5,671
8	**Securitization**	1,787	1,220
9	**Total**	**17,253**	**17,731**

MR2: RWA flow statements of market risk exposures under the Internal Models Approach (IMA)

The following table presents variations in the Market RWA determined under the Internal Models Approach.

As at October 31, 2022

		a	b	c	d	e	f
	(Millions of Canadian dollars)	VaR	Stressed VaR	IRC	CRM	Other	Total RWA
1	**RWA at previous quarter end**	**2,714**	**9,614**	**4,492**	**-**	**-**	**16,820**
2	Movement in risk levels[1]	(725)	1,571	(81)	-	-	765
3	Model updates/changes[2]	616	110	(403)	-	-	323
4	Methodology and policy[3]	-	-	-	-	-	-
5	Acquisitions and disposals	-	-	-	-	-	-
6	Foreign exchange movements[4]	-	-	181	-	-	181
7	Other	-	-	-	-	-	-
8	**RWA at end of Reporting Period**	**2,605**	**11,295**	**4,189**	**-**	**-**	**18,089**

[1] Change in risk due to position changes and averaging in of prior quarter model updates.

[2] Updates to the model to reflect recent market volatility, model implementation, change in model scope or any change to address model malfunctions including changes through model calibrations/realignments.

[3] Methodology changes to the calculations driven by regulatory policy changes. Please note that these changes may be temporary.

[4] Foreign exchange movements for VaR and Stressed VaR are embedded within movement in risk levels.

As at July 31, 2022

		a	b	c	d	e	f
	(Millions of Canadian dollars)	VaR	Stressed VaR	IRC	CRM	Other	Total RWA
1	**RWA at previous quarter end**	**4,558**	**11,825**	**4,431**	**-**	**-**	**20,814**
2	Movement in risk levels[1]	884	(2,069)	77	-	-	(1,108)
3	Model updates/changes[2]	(2,728)	(142)	-	-	-	(2,870)
4	Methodology and policy[3]	-	-	-	-	-	-
5	Acquisitions and disposals	-	-	-	-	-	-
6	Foreign exchange movements[4]	-	-	(16)	-	-	(16)
7	Other	-	-	-	-	-	-
8	**RWA at end of Reporting Period**	**2,714**	**9,614**	**4,492**	**-**	**-**	**16,820**

[1] Change in risk due to position changes and averaging in of prior quarter model updates.

[2] Updates to the model to reflect recent market volatility, model implementation, change in model scope or any change to address model malfunctions including changes through model calibrations/realignments.

[3] Methodology changes to the calculations driven by regulatory policy changes. Please note that these changes may be temporary.

[4] Foreign exchange movements for VaR and Stressed VaR are embedded within movement in risk levels.

MR3: IMA values for trading portfolios

The following table presents minimum, maximum, average and period-end regulatory 10 day VaR, regulatory 10 day stressed VaR, incremental risk charge and comprehensive risk capital charge. These measures are based on the scope of the global trading book with internal models approach (IMA) approval from OSFI for calculating regulatory market risk capital.

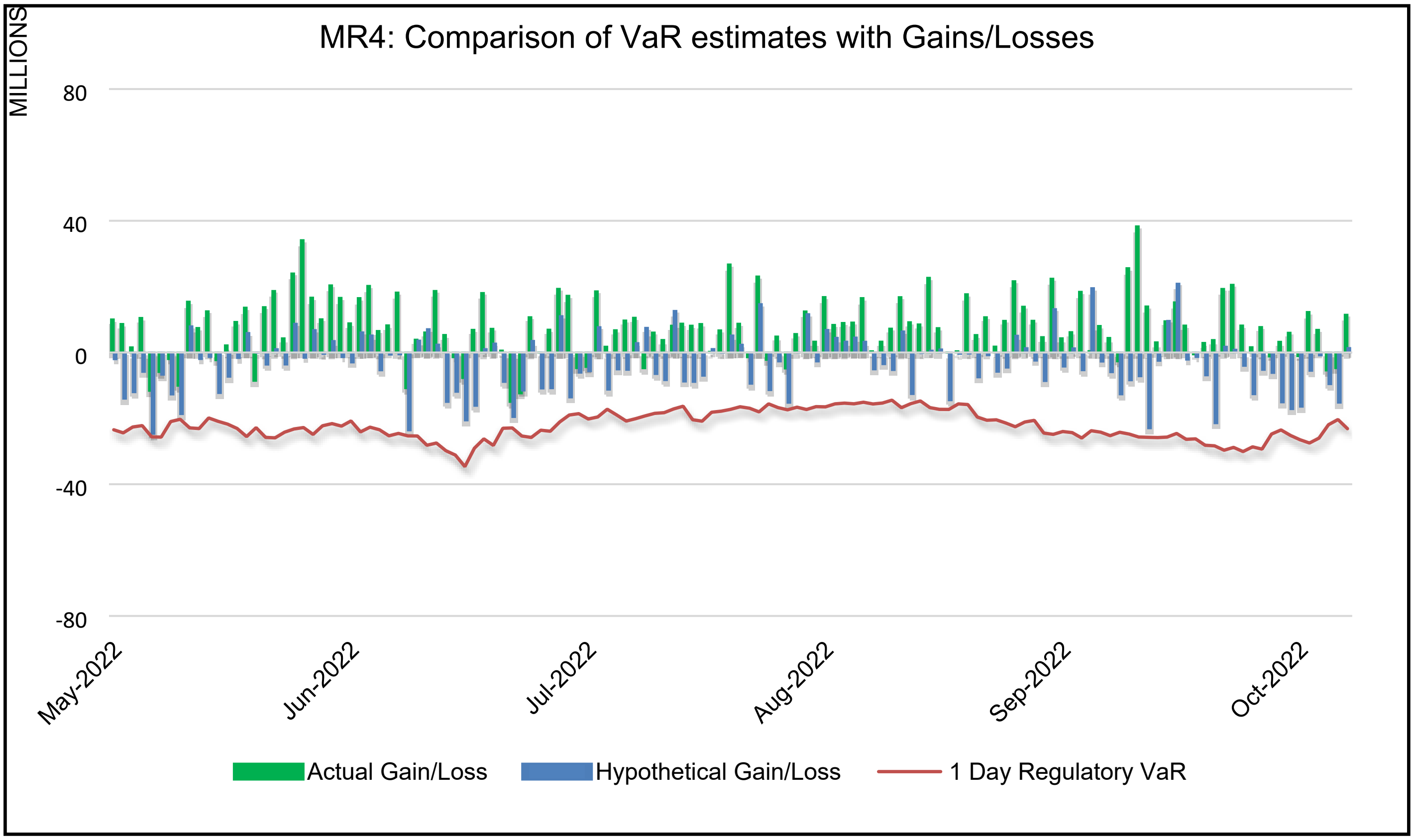
(Millions of Canadian dollars)		Value	
VaR (10 day 99%)[1,2]		As at October 31, 2022	As at July 31, 2022
1	Maximum value	95	110
2	Average value	68	73
3	Minimum value	46	52
4	Period end	73	62
Stressed VaR (10 day 99%)[1]			
5	Maximum value	399	340
6	Average value	296	260
7	Minimum value	191	159
8	Period end	276	242
Incremental Risk Charge (99.9%)			
9	Maximum value	468	426
10	Average value	340	354
11	Minimum value	279	277
12	Period end	327	359
Comprehensive Risk capital charge (99.9%)			
13	Maximum value	-	-
14	Average value	-	-
15	Minimum value	-	-
16	Period end	-	-
17	Floor (standardized measurement method)	-	-

[1] The portfolio included in regulatory VaR and SVaR represents a subset of the portfolio captured in management VaR and SVaR reported in the Market Risk section of the 2022 Annual Report.

[2] VaR shown this quarter reflects the more conservative of either a one-day holding period scaled up to a ten-day holding period or the direct ten-day holding period.

MR4: Comparison of VaR estimates with gains/losses

The following graph compares the results of the 1 day regulatory VaR model with both hypothetical and actual trading gains and losses, for all trading portfolios included in Internal Models Approach (IMA) based market risk capital.



Actual Gain/Loss reported in this graph is the gain or loss which occurred as a result of all portfolio changes impacting income over the holding period and therefore includes reserves and intraday trading but excludes commissions and fees. Hypothetical Gain/Loss is the gain or loss which would have occurred if end of day positions remained unchanged.

Refer to table MRB for further details into our backtesting program and a list of the key models used at the group-wide level with explanations as to the extent they represent the models used at the group-wide level.

During the six month period ending Oct 31, 2022, the bank experienced zero backtesting exceptions of Total Risk VaR against Actual Gain/Loss and zero Hypothetical Gain/Loss breaches.

LEVERAGE

LR1: Summary comparison of accounting assets vs leverage ratio exposure measure

The following table presents a reconciliation of our total assets per our published financial statements to our leverage ratio exposure measure.

LEVERAGE RATIO[1] Summary comparison of accounting assets vs. leverage ratio exposure measure (Millions of Canadian dollars)		Q4/2022	Q3/2022	Q2/2022	Q1/2022	Q4/2021
1	**Total consolidated assets as per published financial statements**	**$1,917,219**	**$1,842,092**	**1,848,572**	**1,752,469**	**1,706,323**
2	Adjustment for investments in banking, financial, insurance or commercial entities that are consolidated for accounting purposes but outside the scope of regulatory consolidation	(16,073)	(16,940)	(16,400)	(17,701)	(17,206)
3	Adjustment for securitized exposures that meet the operational requirements for the recognition of risk transfer[2]	-	-	-	-	-
4	Adjustment for fiduciary assets recognized on the balance sheet pursuant to the operative accounting framework but excluded from the leverage ratio exposure measure	-	-	-	-	-
5	Adjustments for derivative financial instruments	(51,188)	(23,150)	(51,622)	(246)	(4,765)
6	Adjustment for securities financing transactions (SFT) (i.e. repo assets and similar secured lending)	16,624	15,711	15,557	16,430	13,907
7	Adjustments for off-balance sheet items (i.e., credit equivalent amounts of off-balance sheet exposures)	251,034	239,621	235,629	228,707	222,658
8	Other adjustments[3]	(219,437)	(217,489)	(219,307)	(219,030)	(258,873)
9	**Leverage Ratio Exposure**	**$1,898,179**	**$1,839,845**	**1,812,429**	**1,760,629**	**1,662,044**

[1] Based on OSFI's LR guideline issued in October 2018.

[2] OSFI's October 2018 LR guideline allows for the exclusion of securitized exposures that meet the operational requirements for risk transference. In Q1/2021 transitional methodology changes under the securitization framework did not allow us to recognize risk transference as further explained in SEC 1.

[3] Includes OSFI permitted exclusion of central bank reserves and sovereign-issued securities that qualify as high quality liquid assets and exposures related to the US Government Payment Protection Program (PPP).

LR2: Leverage ratio common disclosure template

The following table presents a detailed breakdown of the components of our leverage ratio. Maintaining a prescribed minimum level of leverage helps neutralizes leverage risk in the event of unexpected economic crises. OSFI requires maintenance of a minimum leverage ratio of 3% at all times.

	LEVERAGE RATIO COMMON DISCLOSURE TEMPLATE[1] (Millions of Canadian dollars, except percentages)	Q4/2022	Q3/2022	Q2/2022	Q1/2022	Q4/2021
	On-balance sheet exposures					
1	On-balance sheet items (excluding derivatives, SFTs and grandfathered securitization exposures, but including collateral)	1,254,962	1,203,354	1,179,634	1,141,785	1,057,130
2	Gross-up for derivatives collateral provided where deducted from balance sheet assets pursuant to the operative accounting framework (IFRS)	-	-	-	-	-
3	(Deductions of receivables assets for cash variation margin provided in derivatives transactions)	(26,414)	(20,944)	(24,092)	(15,829)	(16,317)
4	(Asset amounts deducted in determining Basel III Tier 1 capital)	(22,090)	(18,434)	(19,042)	(17,627)	(17,088)
5	**Total on-balance sheet exposure (excluding derivatives and SFTs) (sum of lines 1 and 4)**	**1,206,458**	**1,163,976**	**1,136,500**	**1,108,329**	**1,023,725**
	Derivatives exposures					
6	Replacement cost associated with all derivatives transactions (i.e., net of eligible cash variation margin)	41,180	35,086	43,576	27,241	29,322
7	Add-on amounts for potential future exposure (PFE) associated with all derivatives transactions	60,172	62,798	60,134	64,451	61,188
8	(Exempted central counterparty (CCP)-leg of client-cleared trade exposures)	-	-	-	-	-
9	Adjusted effective notional amount of written credit derivatives	1,897	1,023	872	381	266
10	(Adjusted effective notional offsets and add-on deductions for written credit derivatives)	-	-	-	-	-
11	**Total derivative exposures (sum of lines 6 to 10)**	**103,249**	**98,907**	**104,582**	**92,073**	**90,776**
	Securities financing transaction exposures					
12	Gross SFT assets recognized for accounting purposes (with no recognition of netting), after adjusting for sale accounting transactions	415,017	416,893	401,372	399,556	388,006
13	(Netted amounts of cash payables and cash receivables of gross SFT assets)	(94,203)	(95,262)	(81,211)	(84,466)	(77,028)
14	Counterparty credit risk (CCR) exposure for SFTs	16,624	15,710	15,557	16,430	13,907
15	Agent transaction exposures	-	-	-	-	-
16	**Total securities financing transaction exposures (sum of lines 12 to 15)**	**337,438**	**337,341**	**335,718**	**331,520**	**324,885**
	Other off-balance sheet exposures					
17	Off-balance sheet exposures at gross notional amount	733,563	706,583	694,093	676,761	660,224
18	(Adjustments for conversion to credit equivalent amounts)	(482,529)	(466,962)	(458,464)	(448,054)	(437,566)
19	**Off-balance sheet items (sum of lines 17 and 18)**	**251,034**	**239,621**	**235,629**	**228,707**	**222,658**
	Capital and Total Exposures					
20	**Tier 1 capital**	**84,242**	**84,207**	**84,345**	**84,493**	**82,246**
20a	**Tier 1 capital with transitional arrangements for ECL provisioning not applied**	**84,070**	**84,073**	**84,242**	**84,298**	**81,826**
21	**Total Exposures (sum of lines 3,11,16 and 19)**	**1,898,179**	**1,839,845**	**1,812,429**	**1,760,629**	**1,662,044**
	Leverage ratio					
22	**Basel III leverage ratio**	**4.4%**	**4.6%**	**4.7%**	**4.8%**	**4.9%**
22a	**Basel III leverage ratio with transitional arrangements for ECL provisioning not applied**	**4.4%**	**4.6%**	**4.6%**	**4.8%**	**4.9%**

[1] Based on OSFI's LR guideline issued October 2018.

Our Leverage ratio of 4.4% was down 50 bps from October 31, 2021, mainly reflecting share repurchases, business-driven growth in leverage exposures, lower regulatory modifications, unfavourable impact of fair value OCI adjustments, and the impact of our Brewin Dolphin acquisition. These factors were partially offset by net internal capital generation.

Leverage exposures increased by $236 billion mainly driven by business growth in retail and wholesale loans, and undrawn commitments. The impact of foreign exchange translation and lower regulatory modifications, mainly due to the reversal of the sovereign-issued securities qualifying as HQLA, also contributed to the increase.

TOTAL LOSS ABSORBING CAPACITY (TLAC) DISCLOSURE REQUIREMENTS

KM2: Key metrics – TLAC requirements (at resolution group level)

The following summary table provides information about our TLAC available, and TLAC requirements applied, at the resolution group level under a Single Point of Entry. TLAC requirements establish two minimum standards, which are required to be met effective November 1, 2021: the risk-based TLAC ratio, which builds on the risk-based capital ratios described in the CAR guideline, and the TLAC leverage ratio, which builds on the leverage ratio described in OSFI's LR guideline. The risk-based TLAC ratio is defined as TLAC divided by Total risk-weighted assets (RWA) while the TLAC leverage ratio is defined as TLAC divided by the Leverage ratio exposure. OSFI requires systemically important banks to maintain a minimum TLAC ratio of 24% (inclusive of the domestic stability buffer of 2.5%) and a TLAC leverage ratio of 6.75%. We began issuing TLAC eligible debt in Q4 2018 and our TLAC ratio is expected to increase through normal course refinancing of maturing debt.

		a	b	c	d	e	f
(Millions of Canadian dollars, except as otherwise noted)		October 31 2022	July 31 2022	April 30 2022	January 31 2022	October 31 2021	Change (a) - (b)
Resolution group[1]							
1	Total loss-absorbing capacity (TLAC) available	160,961	162,284	158,140	150,136	142,202	(1,323)
1a	Total loss-absorbing capacity (TLAC) available with transitional arrangements for ECL provisioning not applied	160,961	162,284	158,140	150,136	142,202	(1,323)
2	Total RWA at the level of the resolution group	609,879	589,050	585,839	569,285	552,541	20,829
3	TLAC ratio: TLAC as a percentage of RWA (row 1/row 2) (%)	26.4%	27.6%	27.0%	26.4%	25.7%	(1.2)%
3a	TLAC ratio: TLAC as a percentage of RWA (row 1a / row 2) (%) available with transitional arrangements for ECL provisioning not applied	26.4%	27.6%	27.0%	26.4%	25.7%	(1.2)%
4	Leverage ratio exposure measure at the level of the resolution group	1,898,179	1,839,845	1,812,429	1,760,629	1,662,044	58,334
5	TLAC Leverage Ratio: TLAC as a percentage of leverage ratio exposure measure (row 1/row 4) (%)	8.5%	8.8%	8.7%	8.5%	8.6%	(0.3)%
5a	TLAC Leverage Ratio: TLAC as a percentage of leverage ratio exposure measure (row 1a/row 4) (%) with transitional arrangements for ECL provisioning not applied	8.5%	8.8%	8.7%	8.5%	8.6%	(0.3)%
6a	Does the subordination exemption in the antepenultimate paragraph of Section 11 of the FSB TLAC Term Sheet apply?	Yes	Yes	Yes	Yes	Yes	-
6b	Does the subordination exemption in the penultimate paragraph of Section 11 of the FSB TLAC Term Sheet apply?	No	No	No	No	No	-
6c	If the capped subordination exemption applies, the amount of funding issued that ranks pari passu with Excluded Liabilities and that is recognized as external TLAC, divided by funding issued that ranks pari passu with Excluded Liabilities and that would recognized as external TLAC if no cap was applied (%)	N/A	N/A	N/A	N/A	N/A	-

[1] Lines 1, 3 and 5 incorporate expected credit loss (ECL) transitional modification provided by OSFI as announced on March 27, 2020. Lines 1a, 3a and 5a represent TLAC available with transitional arrangements for ECL provisioning not applied.

Our TLAC ratio of 26.4% was up 70 bps from 25.7% as at October 31, 2021, reflecting a favourable impact from the net issuance of external TLAC instruments, partially offset by the factors noted above under KM1.

Our TLAC leverage ratio of 8.5% was down 10 bps from 8.6% as at October 31, 2021, reflecting the factors noted above under the LR2, partially offset by a favourable impact from the net issuance of external TLAC instruments. External TLAC instruments include long-term senior debt subject to conversion into common shares under the Bail-in regime.

TLAC1: TLAC composition (at resolution group level)

The following table presents details of the composition of our TLAC.

As at October 31, 2022

	(Millions of Canadian dollars, except as otherwise noted)	Amount
	Regulatory capital elements of TLAC and adjustments	
1	Common Equity Tier 1 capital (CET1)	76,945
2	Additional Tier 1 capital (AT1) before TLAC adjustments	7,297
3	AT1 ineligible as TLAC as issued out of subsidiaries to third parties	-
4	Other adjustments	-
5	AT1 instruments eligible under the TLAC framework	7,297
6	Tier 2 capital (T2) before TLAC adjustments	9,608
7	Amortised portion of T2 instruments where remaining maturity > 1 year	818
8	T2 capital ineligible as TLAC as issued out of subsidiaries to third parties	-
9	Other adjustments	-
10	T2 instruments eligible under the TLAC framework	10,426
11	TLAC arising from regulatory capital	94,668
	Non-regulatory capital elements of TLAC	
12	External TLAC instruments issued directly by the bank and subordinated to excluded liabilities	-
13	External TLAC instruments issued directly by the bank which are not subordinated to excluded liabilities but meet all other TLAC term sheet requirements	66,528
14	Of which: amount eligible as TLAC after application of the caps	66,528
15	External TLAC instruments issued by funding vehicles prior to January 1, 2022	-
16	Eligible ex ante commitments to recapitalise a G-SIB in resolution	-
17	TLAC arising from non-regulatory capital instruments before adjustments	66,528
	Non-regulatory capital elements of TLAC: adjustments	
18	TLAC before deductions	161,196
19	Deductions of exposures between MPE resolution groups that correspond to items eligible for TLAC (not applicable to SPE G-SIBs and D-SIBs)	-
20	Deduction of investments in own other TLAC liabilities	(235)
21	Other adjustments to TLAC	-
22	TLAC available after deductions	160,961
	Risk-weighted assets and leverage exposure measure for TLAC purposes	
23	Total risk-weighted assets adjusted as permitted under the TLAC regime	609,879
24	Leverage exposure measure	1,898,179
	TLAC ratios and buffers	
25	TLAC Ratio (as a percentage of risk-weighted assets adjusted as permitted under the TLAC regime, row 22 / row 23)	26.4%
26	TLAC Leverage Ratio (as a percentage of leverage exposure)	8.5%
27	CET1 (as a percentage of risk-weighted assets) available after meeting the resolution group's minimum capital and TLAC requirements	7.4%
28	Institution-specific buffer (capital conservation buffer plus countercyclical buffer plus higher loss absorbency, expressed as a percentage of risk-weighted assets)	3.5%
29	Of which: capital conservation buffer	2.5%
30	Of which: bank specific countercyclical buffer	0.0%
31	Of which: higher loss absorbency	1.0%

TLAC1: TLAC composition (at resolution group level) (continued)

As at July 31, 2022

(Millions of Canadian dollars, except as otherwise noted)		Amount
	Regulatory capital elements of TLAC and adjustments	
1	Common Equity Tier 1 capital (CET1)	76,907
2	Additional Tier 1 capital (AT1) before TLAC adjustments	7,300
3	AT1 ineligible as TLAC as issued out of subsidiaries to third parties	-
4	Other adjustments	-
5	AT1 instruments eligible under the TLAC framework	7,300
6	Tier 2 capital (T2) before TLAC adjustments	9,650
7	Amortised portion of T2 instruments where remaining maturity > 1 year	768
8	T2 capital ineligible as TLAC as issued out of subsidiaries to third parties	-
9	Other adjustments	-
10	T2 instruments eligible under the TLAC framework	10,418
11	TLAC arising from regulatory capital	94,625
	Non-regulatory capital elements of TLAC	
12	External TLAC instruments issued directly by the bank and subordinated to excluded liabilities	-
13	External TLAC instruments issued directly by the bank which are not subordinated to excluded liabilities but meet all other TLAC term sheet requirements	67,857
14	Of which: amount eligible as TLAC after application of the caps	67,857
15	External TLAC instruments issued by funding vehicles prior to January 1, 2022	-
16	Eligible ex ante commitments to recapitalise a G-SIB in resolution	-
17	TLAC arising from non-regulatory capital instruments before adjustments	67,857
	Non-regulatory capital elements of TLAC: adjustments	
18	TLAC before deductions	162,482
19	Deductions of exposures between MPE resolution groups that correspond to items eligible for TLAC (not applicable to SPE G-SIBs and D-SIBs)	-
20	Deduction of investments in own other TLAC liabilities	(198)
21	Other adjustments to TLAC	-
22	TLAC available after deductions	162,284
	Risk-weighted assets and leverage exposure measure for TLAC purposes	
23	Total risk-weighted assets adjusted as permitted under the TLAC regime	589,050
24	Leverage exposure measure	1,839,845
	TLAC ratios and buffers	
25	TLAC Ratio (as a percentage of risk-weighted assets adjusted as permitted under the TLAC regime, row 22 / row 23)	27.6%
26	TLAC Leverage Ratio (as a percentage of leverage exposure)	8.8%
27	CET1 (as a percentage of risk-weighted assets) available after meeting the resolution group's minimum capital and TLAC requirements	7.9%
28	Institution-specific buffer (capital conservation buffer plus countercyclical buffer plus higher loss absorbency, expressed as a percentage of risk-weighted assets)	3.5%
29	Of which: capital conservation buffer	2.5%
30	Of which: bank specific countercyclical buffer	0.0%
31	Of which: higher loss absorbency	1.0%

TLAC2: Material subgroup entity – creditor ranking at legal entity level (G-SIBs only)

TLAC 2 is a G-SIB disclosure requirement to provide the ranking of the liability structure of all our material subsidiaries in foreign jurisdictions as defined by the FSB TLAC term sheet. RBC US Group Holdings LLC ("RBC IHC") is a material subsidiary entity for which TLAC 2 disclosure would be required. Effective January 1, 2021, RBC IHC must comply with the Federal Reserve TLAC rules which require reporting of TLAC ratios for calendar quarters on or after June 2021. OSFI has advised RBC it can align its IHC TLAC 2 disclosure requirements to similarly commence in Q3 2021 and will require only disclosure of IHC calendar quarter TLAC ratios. OSFI does require us to disclose TLAC 2 for any other material subsidiary identified, however, at this time RBC IHC is our only material subsidiary.

As at October 31, 2022

	(Millions of Canadian dollars, except as otherwise noted) Based on US GAAP	Creditor ranking					
		1	2	3	4	5	Sum
		(most junior)					
1	Is the resolution entity the creditor/investor? (yes or no)	yes	-	no	yes	-	-
2	Description of creditor ranking	Common shares	Preferred shares and Limited Recourse Capital Notes	Subordinated Debt	Bail-in Debt[1]	Other Liabilities excluding Bail-in Debt and Subordinated Debt[2]	
3	Total capital and liabilities net of credit risk mitigation	23,863	-	-	16,030	-	39,893
4	Subset of row 3 that are excluded liabilities	-	-	-	-	-	-
5	Total capital and liabilities less excluded liabilities (row 3 minus row 4)	23,863	-	-	16,030	-	39,893
6	Subset of row 5 that are eligible as TLAC	23,863	-	-	16,030	-	39,893
7	Subset of row 6 with 1 year ≤ residual maturity < 2 years			-	-	-	-
8	Subset of row 6 with 2 years ≤ residual maturity < 5 years			-	9,321	-	9,321
9	Subset of row 6 with 5 years ≤ residual maturity < 10 years			-	6,710	-	6,710
10	Subset of row 6 with residual maturity ≥ 10 years, but excluded perpetual securities			-	-	-	-
11	Subset of row 6 that is perpetual securities	23,863	-	-	-	-	23,863

[1] Under the Bail-in regime, claims of some creditors whose claims otherwise rank equally with those of the holders holding bail-inable notes would be excluded from a bail-in conversion and thus the holders and beneficial owners of bail-inable notes will have to absorb losses ahead of these other creditors as a result of the bail-in conversion. Bail-in-Debt represents TLAC Eligible Long-Term Debt based on U.S. TLAC rules.

[2] Completion of this column is not required by OSFI at this time.

TLAC2: Material subgroup entity – creditor ranking at legal entity level (G-SIBs only) (continued)

As at July 31, 2022

(Millions of Canadian dollars, except as otherwise noted) Based on US GAAP		Creditor ranking					
		1	2	3	4	5	Sum
		(most junior)					
1	Is the resolution entity the creditor/investor? (yes or no)	yes	-	no	yes	-	-
2	Description of creditor ranking	Common shares	Preferred shares and Limited Recourse Capital Notes	Subordinated Debt	Bail-in Debt[1]	Other Liabilities excluding Bail-in Debt and Subordinated Debt[2]	
3	Total capital and liabilities net of credit risk mitigation	22,219	-	193	14,283	-	36,695
4	Subset of row 3 that are excluded liabilities	-	-	193	-	-	193
5	Total capital and liabilities less excluded liabilities (row 3 minus row 4)	22,219	-	-	14,283	-	36,502
6	Subset of row 5 that are eligible as TLAC	22,219	-	-	14,283	-	36,502
7	Subset of row 6 with 1 year ≤ residual maturity < 2 years			-	-	-	-
8	Subset of row 6 with 2 years ≤ residual maturity < 5 years			-	8,035	-	8,035
9	Subset of row 6 with 5 years ≤ residual maturity < 10 years			-	6,248	-	6,248
10	Subset of row 6 with residual maturity ≥ 10 years, but excluded perpetual securities			-	-	-	-
11	Subset of row 6 that is perpetual securities	22,219	-	-	-	-	22,219

[1] Under the Bail-in regime, claims of some creditors whose claims otherwise rank equally with those of the holders holding bail-inable notes would be excluded from a bail-in conversion and thus the holders and beneficial owners of bail-inable notes will have to absorb losses ahead of these other creditors as a result of the bail-in conversion. Bail-in-Debt represents TLAC Eligible Long-Term Debt based on U.S. TLAC rules.

[2] Completion of this column is not required by OSFI at this time.

TLAC3: Resolution entity – creditor ranking at legal entity level

The following table provides information regarding the ranking of our unsecured liabilities structure at the resolution entity level.

As at October 31, 2022

(Millions of Canadian dollars, except as otherwise noted)		Creditor ranking 1 (most junior)	2	3	4	5	Sum
1	Description of creditor ranking	Common shares	Preferred shares and Limited Recourse Capital Notes	Subordinated Debt	Bail-in Debt[1]	Other Liabilities excluding Bail-in Debt and Subordinated Debt[2]	
2	Total capital and liabilities net of credit risk mitigation	17,318	7,323	10,566	84,819	-	120,026
3	Subset of row 2 that are excluded liabilities	334	5	37	12,189	-	12,565
4	Total capital and liabilities less excluded liabilities (row 2 minus row 3)	16,984	7,318	10,529	72,630	-	107,461
5	Subset of row 4 that are *potentially* eligible as TLAC	16,984	7,318	10,469	72,630	-	107,401
6	Subset of row 5 with 1 year ≤ residual maturity < 2 years			-	18,709	-	18,709
7	Subset of row 5 with 2 years ≤ residual maturity < 5 years			2,045	38,751	-	40,796
8	Subset of row 5 with 5 years ≤ residual maturity < 10 years			6,963	9,023	-	15,986
9	Subset of row 5 with residual maturity ≥ 10 years, but excluding perpetual securities			1,461	6,147	-	7,608
10	Subset of row 5 that is perpetual securities	16,984	7,318	-	-	-	24,302

[1] Under the Bail-in regime, claims of some creditors whose claims otherwise rank equally with those of the holders holding bail-inable notes would be excluded from a bail-in conversion and thus the holders and beneficial owners of bail-inable notes will have to absorb losses ahead of these other creditors as a result of the bail-in conversion.

[2] Completion of this column is not required by OSFI at this time.

TLAC3: Resolution entity – creditor ranking at legal entity level (continued)

As at July 31, 2022

	(Millions of Canadian dollars, except as otherwise noted)	Creditor ranking					
		1	2	3	4	5	Sum
		(most junior)					
1	Description of creditor ranking	Common shares	Preferred shares and Limited Recourse Capital Notes	Subordinated Debt	Bail-in Debt[1]	Other Liabilities excluding Bail-in Debt and Subordinated Debt[2]	
2	Total capital and liabilities net of credit risk mitigation	17,367	7,323	10,424	75,491	-	110,605
3	Subset of row 2 that are excluded liabilities	275	-	58	4,836	-	5,169
4	Total capital and liabilities less excluded liabilities (row 2 minus row 3)	17,092	7,323	10,366	70,655	-	105,436
5	Subset of row 4 that are *potentially* eligible as TLAC	17,092	7,323	10,310	70,655	-	105,380
6	Subset of row 5 with 1 year ≤ residual maturity < 2 years			-	20,930	-	20,930
7	Subset of row 5 with 2 years ≤ residual maturity < 5 years			1,921	35,570	-	37,491
8	Subset of row 5 with 5 years ≤ residual maturity < 10 years			6,942	8,485	-	15,427
9	Subset of row 5 with residual maturity ≥ 10 years, but excluding perpetual securities			1,447	5,670	-	7,117
10	Subset of row 5 that is perpetual securities	17,092	7,323	-	-	-	24,415

[1] Under the Bail-in regime, claims of some creditors whose claims otherwise rank equally with those of the holders holding bail-inable notes would be excluded from a bail-in conversion and thus the holders and beneficial owners of bail-inable notes will have to absorb losses ahead of these other creditors as a result of the bail-in conversion.

[2] Completion of this column is not required by OSFI at this time.

OPERATIONAL RISK

The table below presents an overview of Pillar 3 disclosure requirements that have been met within our 2022 Annual Report and incorporated by reference into this Pillar 3 report. Our 2022 Annual Report is available free of charge on our website at http://www.rbc.com/investorrelations

Pillar 3 disclosures requirement		2022 Annual Report section	Sub-section
a)	Details of the approach for operational risk capital assessment for which the bank qualifies	Operational risk	Operational risk capital
b)	Description of the advanced measurement approaches for operational risk (AMA)[1]	n/a	n/a
c)	For banks using the AMA, a description of the use of insurance for the purpose of mitigating operational risk[1]	n/a	n/a

[1] Effective November 1, 2019, OSFI discontinued the AMA approach.

INTEREST RATE RISK IN THE BANKING BOOK

The table below presents an overview of Pillar 3 disclosure requirements that have been met within our 2022 Annual Report and incorporated by reference into this Pillar 3 report. Our 2022 Annual Report is available free of charge on our website at http://www.rbc.com/investorrelations

Pillar 3 disclosures requirement	2022 Annual Report section	Sub-section
Interest rate risk in the banking book	Market Risk	Market Risk