2022 Annual Report

At a Glance

Founded in 1859, National Bank of Canada offers financial services to individuals, businesses, institutional clients and governments across Canada. We are one of Canada's six systemically important banks and among the most profitable banks on a global basis by return on equity.

We operate through three business segments in Canada—Personal and Commercial Banking, Wealth Management and Financial Markets. A fourth segment—U.S. Specialty Finance and International—complements the growth of our domestic operations.

We are a leading bank in our core Quebec market and also hold leadership positions across the country in selected activities.

We strive to meet the highest standards of social responsibility while creating value for our shareholders. We are proud to be recognized as an employer of choice and for promoting diversity and inclusion.

We are headquartered in Montreal, and our securities are listed on the Toronto Stock Exchange (TSX: NA).

2.7 million Clients[1]

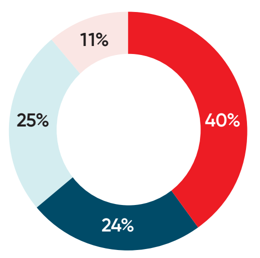
29,509 Employees[2]

$9.7 B Total Revenues

$3.4 B Net Income

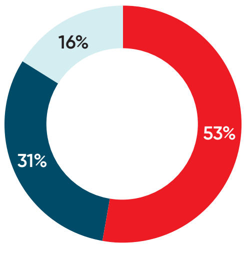
$404 B Total Assets

$31.2 B Market Capitalization



2022 Total Revenues – Adjusted by Business Segment[3]

- Personal and Commercial
- Wealth Management
- Financial Markets
- U.S. Specialty Finance and International



2022 Total Revenues – Adjusted by Geographic Distribution[3]

- Province of Quebec
- Other Canadian provinces
- Outside of Canada

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(1) Clients of the Personal and Commercial segment
(2) Worldwide
(3) Excluding the *Other* heading. See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP financial measures.

Investing in National Bank

OUR PILLARS

Our Culture

- Entrepreneurial culture
- Proven agility
- Collaboration
- Diversity and inclusion

Our Strategic Positioning

- Canadian bank with leading franchise in Quebec
- Differentiated positioning in Financial Markets and Wealth Management
- Focused strategy outside of Canada

Our Discipline

- Strong risk management culture
- Disciplined cost management
- Solid capital levels
- Sound ESG governance

OUR PERFORMANCE IN 2022

Superior ROE[1]

18.8%

2022 Return on Common Shareholders' Equity[2] (ROE)

Strong Earnings Growth

9.9% | 11.4%[3]

Growth of Income Before Provisions for Credit Losses and Income Taxes (2021–2022)

Solid Capital Position

12.7%

Common Equity Tier 1 (CET1) Ratio[4] as at October 31, 2022

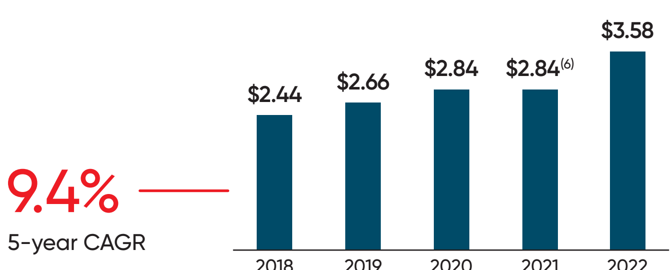
Solid Credit Performance

7 bps[2]

PCL on Impaired Loans (excl. POCI) Ratio[5]

Sustainable Dividend Growth

($ per share)



Premium Total Shareholder Returns[2]

CAGR for the periods ended October 31, 2022[2][7]

	Ranking[8]	National Bank	Canadian Peers[8]	TSX
3 years	#1	15%	9%	9%
5 years	#1	13%	7%	7%
10 years	#1	14%	11%	8%

(1) Based on Return on common shareholders' equity (ROE) as reported by Canadian peers, including Bank of Montreal, Canadian Imperial Bank of Commerce, Royal Bank of Canada, Bank of Nova Scotia and Toronto-Dominion Bank (together, the Canadian peers).
(2) See the Glossary section on pages 122 to 125 for details on the composition of these measures.
(3) Growth of adjusted income before provisions for credit losses and income taxes. See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP financial measures.
(4) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.
(5) Represents provisions for credit losses on impaired loans excluding purchased or originated credit impaired (POCI) loans as a percentage of average loans and acceptances. See the Glossary section on pages 122 to 125 for details of this measure.
(6) Interruption of any dividend increases, as prescribed by the Office of the Superintendent of Financial Institutions (OSFI) between March 13, 2020 and November 4, 2021.
(7) Compound annual growth rate. Source: Nasdaq IR Insight via Factset.
(8) Among Canadian peers, as defined above.

Financial Overview

Medium-Term Objectives and Results

	Medium-Term Objectives	2022 Results
Growth in diluted earnings per share – Adjusted[1]	5–10%	8.3%
ROE – Adjusted[2]	15–20%	18.8%
Dividend payout ratio – Adjusted[2]	40–50%	36.8%
CET1 capital ratio[3]	Strong level	12.7%
Leverage ratio[3]	Strong level	4.5%

Financial Highlights

As at October 31 or for the year ended October 31 (millions of Canadian dollars, except per share amounts)	**2022**	2021
Operating results		
Total revenues	**9,652**	8,927
Income before provisions for credit losses and income taxes	**4,422**	4,024
Net income	**3,383**	3,140
Diluted earnings per share	**$ 9.61**	$ 8.85
Return on common shareholders' equity[4]	**18.8 %**	20.7 %
Dividend payout ratio[4]	**36.8 %**	31.7 %
Operating results – Adjusted[1]		
Total revenues – Adjusted	**9,934**	9,116
Income before provisions for credit losses and income taxes – Adjusted	**4,704**	4,222
Net income – Adjusted	**3,383**	3,147
Diluted earnings per share – Adjusted	**$ 9.61**	$ 8.87
Efficiency ratio – Adjusted[2]	**52.6 %**	53.7 %
Dividends declared	**$ 3.58**	$ 2.84
Total assets	**403,740**	355,621

(1) See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP financial measures.
(2) See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP ratios.
(3) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital measures.
(4) See the Glossary section on pages 122 to 125 for details on the composition of these measures.

Message From the President and Chief Executive Officer

As I look back on my first year, I am proud of all that has been accomplished in a year marked by an uncertain and challenging economic and operating environment. Our strong performance in this context was made possible by the dedication of our talented team, the relationships we have built with our clients and our constant focus on value creation.

Early in the year, we saw significant improvements globally from both health and economic perspectives. As the year progressed, inflation accelerated, interest rates rose and geopolitical risks intensified, contributing to persistent volatility and heightened economic uncertainty. We successfully navigated this complex environment, remained focused on the execution of our strategic priorities and delivered strong financial results.

Our consistent performance is supported by our three key pillars. First, our culture encourages us to be agile, entrepreneurial and to work as a team, enabling us to adapt and seize opportunities. Second, our unique strategic positioning with a domestic focus, a leading franchise in Quebec and a targeted strategy outside Canada provides diversification to our earnings streams and resiliency through market cycles. Finally, our disciplined approach towards capital allocation, risk management and cost management is the cornerstone of our robust balance sheet. This solid foundation will continue to support future performance.

Discipline, Consistency, Performance

In fiscal 2022, we generated superior organic growth across all our business segments. Operating leverage, a key performance indicator, was positive for the year.

The Bank also generated an industry-leading return on equity. This reflects our ability to strike the right balance between growth, capital deployment discipline and credit quality. It also speaks to the diversification of our activities, which include highly accretive businesses.

In a context of heightened macroeconomic uncertainty, we maintained robust capital levels.

We ended 2022 with strong capital ratios and prudent levels of allowances for credit losses. We continued to prioritize deploying capital to support organic growth, investing in efficiency improvements and returning capital to shareholders.

In 2022, we increased our dividend by 26%. This included a 23% increase paid in February 2022, following the lifting of OSFI restrictions on dividend increases and share buybacks set at the beginning of the pandemic. The objective of this substantial increase was to reset the dividend level towards our medium-term payout target range of 40% to 50% of net income. During the year, we also returned $245 million of capital to shareholders through share repurchases. Total shareholder returns over three-, five-, and 10-year periods remained among the best in our peer group, demonstrating our ability to drive consistent returns over time.

Strong Organic Growth Across All Business Segments

In 2022, our Personal and Commercial Banking business generated solid growth, as we continued to balance volumes, margins and credit quality. We are pleased with our client satisfaction scores, which continued to improve, reflecting our sustained focus on enhancing the end-to-end client experience. We also capitalized on our targeted approach across Canada that is focused on specialized industries. This segment is well-positioned to capture additional market share in Quebec and seize opportunities in other Canadian markets.

Our differentiated Wealth Management segment delivered a strong performance in 2022 despite challenging market conditions. This was supported by a well-diversified revenue mix that includes a strong deposit base, above-market asset growth and enhanced cross-segment opportunities with our other domestic businesses. A key long-term growth lever for the Bank, our Wealth Management business is poised to deliver solid earnings growth and superior return on equity through the cycle.

Message From the President and Chief Executive Officer (cont.)

In 2022, our Financial Markets business demonstrated its resilience and ability to quickly adapt to changing market conditions. Over the years, by investing in people and technology and developing new targeted revenue sources, we have diversified and expanded the earnings power of this segment. The expertise, discipline, strategic focus and sound risk profile of our Financial Markets segment have solidified our leadership in select activities across Canada. This positions the franchise to consistently deliver profitable growth through market cycles.

Beyond Canada, our U.S. Specialty Finance and International segment provides accretive geographic and business diversification. In 2022, Credigy pursued a disciplined investment approach, generating a solid underlying performance. ABA Bank continued to deliver notable growth and is now a leading bank in Cambodia. Our focused international strategy is well-positioned to deliver superior growth and returns over the long term.

Contributing to a Sustainable Economy for All

As a bank, we play a key role in supporting a just energy transition that considers financial and social imperatives, as well as related dependencies of the Canadian economy. On the environment, our strategy is based on two core principles: managing the impact of our activities on climate change and creating opportunities for our clients to contribute to a sustainable economy with us. This includes progressing in our journey to achieve net-zero greenhouse gas (GHG) emissions from operating and financing activities by 2050 and bolstering our support to clients in the transition.

As we continue to grow our renewable energy loan portfolio at a faster pace than non-renewable, decarbonization criteria and data related to our limits on high-emitting sector activities are now embedded in our lending and underwriting practices. We are also deploying capital to pursue business opportunities in renewable energy and to expand our adapted offering of sustainable products and services across our business lines.

More broadly, we remain committed to our mission of Putting People First, to generate a positive impact for clients, employees and the communities we have the privilege of serving, while governing ourselves according to the highest standards. From aiming to have over 25% of our workforce comprised of talent from diverse backgrounds, to being the top affordable housing lender in Quebec, we will continue to actively advance our ESG priorities in 2023.

Building on Our Solid Foundation

As we head into 2023, we are confident that our solid foundation will enable us to navigate through economic uncertainty and seize the right opportunities.

To support our long-term growth, we are committed to continuing to invest in our people and our culture. We will remain focused on deepening our client relationships, with the objective of gaining market share both in our core Quebec market and across Canada.

Digital innovation and automation are key to further enhancing the client experience and operational efficiencies, and we are capitalizing on our momentum in these areas.

We also see tremendous opportunity for cross-segment synergies, as illustrated by the integration of our commercial and private banking teams in 2022. Working in close collaboration is ingrained in our culture and further enabled by our size and agility. We plan on building on these models across business lines to drive further growth across Canada in the years to come.

With a strong balance sheet and solid risk management framework, we have the flexibility and resilience to face uncertainty and generate continued profitable growth. Our commitment to creating long-term value for our employees, our clients, our shareholders and our communities remains unwavering.

Laurent Ferreira
President and Chief
Executive Officer

Members of the Senior Leadership Team

Laurent Ferreira
President and
Chief Executive Officer

Stéphane Achard
Executive Vice-President
and Co-Head,
Commercial Banking and
Private Banking

Lucie Blanchet
Executive Vice-President,
Personal Banking and
Client Experience

William Bonnell
Executive Vice-President,
Risk Management

Éric Bujold
Executive Vice-President,
and Co-Head,
Commercial Banking and
Private Banking

Étienne Dubuc
Executive Vice-President
and Co-Head,
Financial Markets

Martin Gagnon
Executive Vice-President,
Wealth Management;
Co-President and Co-Chief
Executive Officer,
National Bank Financial

Marie Chantal Gingras
Chief Financial Officer and
Executive Vice-President,
Finance

Denis Girouard
Executive Vice-President
and Co-Head,
Financial Markets

Brigitte Hébert
Executive Vice-President,
Employee Experience

Julie Lévesque
Executive Vice-President,
Technology and Operations

Ghislain Parent
Executive Vice-President,
International

Message From the Chairman of the Board

During a year marked by the integration of a new Chief Executive Officer, the post-pandemic transition, and economic and geopolitical uncertainty, the Bank maintained its commitment to prioritizing the well-being of its employees, clients, communities, and shareholders.

Backed by its talented team, the Bank posted good results in 2022 thanks to a solid foundation on which it is building sustainable growth. The Board is proud of this performance, as it is testament to the Bank's agility, adaptability, and resolute focus on its mission.

In its deliberations, the Board prioritized its attention on the objectives related to strategic planning, technology, talent, sound and rigorous risk management, and environmental, social and governance (ESG) factors, while reinforcing the organizational foundation that will support the Bank's evolution and ability to create long-term value for all of its stakeholders.

Solid Performance Thanks to a Solid Team

Supported by the leadership team, Laurent Ferreira took on the new challenges that arose during his first year heading up the Bank. The Board supported him, particularly in the development and implementation of a three-year strategic plan and in the execution of the ongoing multiyear transformation and cultural shift.

In this context, the Board supported several organizational changes made by the leadership team, including the amalgamation of Information Technology and Operations, the merger of Commercial and Private Banking, and new appointments in Finance and Financial Markets.

The Bank of the Future: Technology-Based and People First

The Bank of the future will continue to put people first while relying on leading-edge technology that will help deliver a unique client experience. The Bank establishes close relationships with clients and has an entrepreneurial culture, and the Board is actively monitoring these competitive advantages for which the Bank is known as well as the impacts of regulatory and technological changes in the sectors where we operate.

The Bank is continuing its digital transformation, but the work is not complete. Technology, including cybersecurity and data protection, continued to receive much attention from the Board in 2022. The Technology Committee, formerly a subcommittee, became a full committee this year. Its mandate consists of overseeing the various components of the Bank's technology strategy and of monitoring technology risks, particularly those related to cybercrime.

Supporting the Transition and Building a Green Economy

The Bank's commitment to environmental, social and governance matters is a key priority, and the Board remains highly involved with the adoption of ESG principles and with monitoring action plans and targets.

In this regard, the Bank achieved an important milestone in 2022 by announcing its first interim greenhouse gas (GHG) emission reduction targets regarding the intensity of the Canadian oil and gas producer portfolio.

By continuing to work with clients on the transition and by developing sustainable products and services, we will truly be able to achieve our targets.

A Positive Impact on Our Employees, Clients and Communities

During the year, the Board continued to pay particular attention to the Bank's culture, which is paramount to its long-term success. Based on a desire to provide a stimulating work environment, the Bank is building a new head office that will offer an optimal employee experience as of 2023 while encouraging a culture of collaboration among teams.

The publication of the Bank's second Inclusion and Diversity Booklet also shows the progress made and the challenges surrounding this important social imperative as well as the main initiatives deployed to maintain constructive dialogue.

Regarding social impact, the Board is proud of the Bank's substantial support for the many community organizations that are working hard to respond to increased demand in the context of the pandemic and high inflation.

Focus on Governance

During the year, the Board welcomed Lynn Loewen as a new director. Her impressive professional experience and expertise in auditing, financial controls, and finance have already proven to be considerable assets to the Board.

We are proud of our entrepreneurial roots and believe it is very important that the composition of the Board reflects the business world. In accordance with the development of the Bank's strategy, we are continuing our reflections on Board composition—a key element of sound governance.

Building a Sustainable Future

Although a climate of uncertainty will probably continue in the year ahead, the Bank will be able to capitalize on its strengths and its deeply rooted culture of agility to remain on the road to success. The Board will maintain its disciplined approach and consider the interests of our employees, clients, communities, and shareholders.

On behalf of the Board of Directors, I would like to draw attention to the leadership team's substantial contributions. We would also like to thank all of our employees for their dedication and for embodying the Bank's values every day.

It is with a steadfast pride that we serve the Bank, and we are more committed than ever to building a sustainable future for the benefit of all our stakeholders.

Jean Houde
Chairman of the Board of Directors

For more information regarding the Bank's governance, please refer to the most recent *Management Proxy Circular*, which is available on the Bank's website at nbc.ca.

Members of the Board of Directors

Jean Houde
Quebec, Canada
Chairman of the Board of Directors,
National Bank of Canada
and Corporate Director
Director since March 2011

Maryse Bertrand
Quebec, Canada
Corporate Director
Director since April 2012

Pierre Blouin
Quebec, Canada
Corporate Director
Director since September 2016

Pierre Boivin
Quebec, Canada
President and Chief Executive Officer, Claridge Inc.
Director since April 2013

Yvon Charest
Quebec, Canada
Corporate Director
Director since April 2020

Patricia Curadeau-Grou
Quebec, Canada
Corporate Director
Director since April 2019

Laurent Ferreira
Quebec, Canada
President and Chief Executive Officer,
National Bank of Canada
Director since February 2021

Karen Kinsley
Ontario, Canada
Corporate Director
Director since December 2014

Lynn Loewen
Quebec, Canada
Corporate Director
Director since April 2022

Rebecca McKillican
Ontario, Canada
Chief Executive Officer,
McKesson Corporation Canada
Director since October 2017

Robert Paré
Quebec, Canada
Strategic Advisor,
Fasken Martineau DuMoulin LLP
and Corporate Director
Director since April 2018

Lino A. Saputo
Quebec, Canada
President and Chief Executive Officer and Chairman of the Board of Directors,
Saputo Inc.
Director since April 2012

Andrée Savoie
New Brunswick, Canada
President and Chair of the Board of Directors,
Acadian Properties Ltd.
Director since April 2015

Macky Tall
Florida, United States
Partner and Chair of the Global Infrastructure Group
The Carlyle Group Inc.
Director since April 2021

Pierre Thabet
Quebec, Canada
President, Boa-Franc Inc.
Director since March 2011

Board Committees

Audit Committee
Karen Kinsley *(Chair)*
Maryse Bertrand
Pierre Blouin
Lynn Loewen
Andrée Savoie
Pierre Thabet

Risk Management Committee
Pierre Thabet *(Chair)*
Yvon Charest
Patricia Curadeau-Grou
Karen Kinsley
Lino A. Saputo
Macky Tall

Technology Committee
Pierre Blouin *(Chair)*
Patricia Curadeau-Grou
Rebecca McKillican
Robert Paré

Human Resources Committee
Pierre Boivin *(Chair)*
Maryse Bertrand
Pierre Blouin
Yvon Charest
Rebecca McKillican
Robert Paré

Conduct Review and Corporate Governance Committee
Yvon Charest *(Chair)*
Patricia Curadeau-Grou
Jean Houde
Robert Paré
Andrée Savoie

OUR ONE MISSION

We exist to have a **POSITIVE IMPACT** in people's lives.

By building ***long-term relationships*** with our clients, employees and communities.

People first.

Why do we need a One Mission?

Our One Mission is aligned with our continued efforts to drive social and economic development. In response to changing trends in the banking industry, we've adopted a people-first approach that will help us achieve our objectives and boost our collaboration with stakeholders.

How is our One Mission put into practice?

- Through the experiences we want to deliver to our clients, our employees and the communities we serve.
- Through behaviours that reflect our values: partnership, empowerment and agility.
- Through the way employees work together to boost client satisfaction, employee engagement and community involvement.
- Through the initiatives we prioritize to have a positive impact.

How We Support Sustainable Development

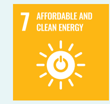
Our ESG Principles

Supporting sustainable development is an intrinsic part of our One Mission. Environmental, social and governance considerations play a key role in our business and operational decisions.

The ESG principles that our Board of Directors have adopted demonstrate our commitment to sustainable development and to balancing the interests of different stakeholders in society.

ENVIRONMENT	SOCIAL	GOVERNANCE
We are working to develop a green economy	We enrich communities	We govern according to the highest standards
1. We consider the fight against climate change in our economic and community actions 2. We guide and advise our clients in their energy transition 3. We manage and reduce our environmental footprint in all of our business segments	4. We maximize the potential of individuals and the community 5. We promote inclusion and diversity 6. We foster entrepreneurship, financial literacy, philanthropy, and support for health and education	7. We promote a strong ethics culture, sound governance practices, and rigorous risk management 8. We manage according to responsible business practices 9. We ensure the long-term viability of the institution

Key United Nations Sustainable Development Goals covered by our principles



5 GENDER EQUALITY

8 DECENT WORK AND ECONOMIC GROWTH

10 REDUCED INEQUALITIES

Our Commitments

In accordance with our principles and to help the Bank achieve its ESG objectives, we have made the following commitments:

ENVIRONMENT

Grow the portfolio of loans related to renewable energy at a faster pace than the portfolio of loans related to non-renewable energy.

Not offer or grant new financing related to oil and gas exploration, exploitation or production in the Arctic.

Not finance new thermal coal mining and processing activities.

SOCIAL

Facilitate access to banking services for underbanked people.

Promote the development and success of women, visible minorities, persons with disabilities, Indigenous persons and members of LGBTQ+ communities.

Promote financial literacy to improve financial knowledge and help people achieve financial security.

GOVERNANCE

Protect our clients' personal information to build and maintain a trust-based relationship with them.

OUR TARGETS

Have **more than a quarter** of our workforce be made up of **people in diversity segments by the end of 2023**

Reduce greenhouse gas emissions from our activities by **25% by the end of 2025**

Reduce portfolio intensity for the **Canadian Oil and Gas Producers** sub-sector by **31% by 2030**

Achieve **net zero emissions** for our **operations and our financing activities by 2050**

In 2022, the Bank also pursued its commitment to the following initiatives:

Our Impact

ESG governance

Working group in charge of the ESG strategy made up of leaders from various sectors.

ESG and the Board

ESG responsibilities included in the mandates of the Board of Directors and all its committees.

Accountability

ESG criteria integrated into **executive compensation**.

$10 B

in capital made available since 2019 for **renewable energy projects** in North America as at October 31, 2022.

98%

of National Bank Investments assets under management managed by **PRI signatories** as at October 31, 2022.

Sustainable finance

Dedicated team that **supports clients** during their transition.

ERG

Employee resource groups representing different diversity segments.

#1

in funding **affordable housing** in Quebec.

SME

Support for a dozen incubators and accelerators to promote entrepreneurship and advance business knowledge.

CCAB

The Bank has committed to the **Progressive Aboriginal Relations** program rolled out by the Canadian Council for Aboriginal Business.

64%

reduction in outstanding loans to Oil and Gas producers and services since 2015, as at October 31, 2022.

FinLit 101

Launched a 3rd financial literacy program in partnership with the Canadian Foundation for Economic Education.

81

With 81 branches in Cambodia, the Bank provides access to basic banking services for underbanked, unbanked and underserved people.

Risk Disclosures

In 2012, the Financial Stability Board (FSB) formed a working group, the Enhanced Disclosure Task Force (EDTF), that was mandated to develop principles for enhancing the risk disclosures of major banks, to recommend improvements to current risk disclosures, and to identify risk disclosure best practices used by major financial institutions. The EDTF published a report entitled *Enhancing the Risk Disclosures of Banks*, which contains 32 recommendations. The Bank makes every effort to ensure overall compliance with those recommendations and is continuing to enhance its risk disclosures to meet the best practices on an ongoing basis. The risk disclosures required by the EDTF are provided in this *Annual Report* and in the document entitled *Supplementary Regulatory Capital and Pillar 3 Disclosure* available on the Bank's website at nbc.ca.

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(1) Fourth quarter 2022.
(2) These pages are included in the document entitled *Supplementary Financial Information – Fourth Quarter 2022.*

Management's Discussion and Analysis

November 29, 2022

The following Management's Discussion and Analysis (MD&A) presents the financial condition and operating results of National Bank of Canada (the Bank). This analysis was prepared in accordance with the requirements set out in *National Instrument 51-102*, *Continuous Disclosure Obligations*, released by the Canadian Securities Administrators (CSA). It is based on the audited annual consolidated financial statements for the year ended October 31, 2022 (the consolidated financial statements) and prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB), unless otherwise indicated. IFRS represent Canadian generally accepted accounting principles (GAAP). This MD&A should be read in conjunction with the consolidated financial statements and accompanying notes for the year ended October 31, 2022. All amounts are presented in Canadian dollars. Additional information about the Bank, including the *Annual Information Form*, can be obtained from the Bank's website at nbc.ca and SEDAR's website at sedar.com. The information found in the various documents and reports published by the Bank or the information available on the Bank's website and mentioned herein is not and should not be considered incorporated by reference into the *2022 Annual Report*, the Management's Discussion and Analysis, or the Consolidated Financial Statements, unless expressly stated otherwise.

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Caution Regarding Forward-Looking Statements

Certain statements in this document are forward-looking statements. All such statements are made in accordance with applicable securities legislation in Canada and the United States. Forward-looking statements in this document may include, but are not limited to, statements with respect to the economy—particularly the Canadian and U.S. economies—market changes, the Bank's objectives, outlook and priorities for fiscal year 2023 and beyond, the strategies or actions that will be taken to achieve them, expectations for the Bank's financial condition, the regulatory environment in which it operates, the impacts of—and the Bank's response to—the COVID-19 pandemic, and certain risks it faces. These forward-looking statements are typically identified by verbs or words such as "outlook", "believe", "foresee", "forecast", "anticipate", "estimate", "project", "expect", "intend" and "plan", in their future or conditional forms, notably verbs such as "will", "may", "should", "could" or "would" as well as similar terms and expressions. Such forward-looking statements are made for the purpose of assisting the holders of the Bank's securities in understanding the Bank's financial position and results of operations as at and for the periods ended on the dates presented, as well as the Bank's vision, strategic objectives, and financial performance targets, and may not be appropriate for other purposes. These forward-looking statements are based on current expectations, estimates, assumptions and intentions and are subject to uncertainty and inherent risks, many of which are beyond the Bank's control.

Assumptions about the performance of the Canadian and U.S. economies in 2023 and how that performance will affect the Bank's business are among the main factors considered in setting the Bank's strategic priorities and objectives, including provisions for credit losses. In determining its expectations for economic conditions, both broadly and in the financial services sector in particular, the Bank primarily considers historical economic data provided by the governments of Canada, the United States and certain other countries in which the Bank conducts business, as well as their agencies.

Statements about the economy, market changes, and the Bank's objectives, outlook and priorities for fiscal 2023 and thereafter are based on a number of assumptions and are subject to risk factors, many of which are beyond the Bank's control and the impacts of which are difficult to predict. These risk factors include, among others, the general economic environment and financial market conditions in Canada, the United States, and other countries where the Bank operates; exchange rate and interest rate fluctuations; inflation; disruptions in global supply chains; higher funding costs and greater market volatility; changes made to fiscal, monetary, and other public policies; changes made to regulations that affect the Bank's business; geopolitical and sociopolitical uncertainty; the transition to a low-carbon economy and the Bank's ability to satisfy stakeholder expectations on environmental and social issues; significant changes in consumer behaviour; the housing situation, real estate market, and household indebtedness in Canada; the Bank's ability to achieve its long-term strategies and key short-term priorities; the timely development and launch of new products and services; the Bank's ability to recruit and retain key personnel; technological innovation and heightened competition from established companies and from competitors offering non-traditional services; changes in the performance and creditworthiness of the Bank's clients and counterparties; the Bank's exposure to significant regulatory matters or litigation; changes made to the accounting policies used by the Bank to report financial information, including the uncertainty inherent to assumptions and critical accounting estimates; changes to tax legislation in the countries where the Bank operates, i.e., primarily Canada and the United States; changes made to capital and liquidity guidelines as well as to the presentation and interpretation thereof; changes to the credit ratings assigned to the Bank; potential disruptions to key suppliers of goods and services to the Bank; potential disruptions to the Bank's information technology systems, including evolving cyberattack risk as well as identity theft and theft of personal information; the risk of fraudulent activity; and possible impacts of major events affecting the local and global economies, including international conflicts, natural disasters, and public health crises such as the COVID-19 pandemic, the evolution of which is difficult to predict and could continue to have repercussions on the Bank.

There is a strong possibility that the Bank's express or implied predictions, forecasts, projections, expectations or conclusions will not prove to be accurate, that its assumptions may not be confirmed and that its vision, strategic objectives and financial performance targets will not be achieved. The Bank recommends that readers not place undue reliance on forward-looking statements, as a number of factors could cause actual results to differ significantly from the expectations, estimates or intentions expressed in these forward-looking statements. These risk factors include credit risk, market risk, liquidity and funding risk, operational risk, regulatory compliance risk, reputation risk, strategic risk, environmental and social risk, and certain emerging risks or risks deemed significant, all of which are described in greater detail in the Risk Management section beginning on page 65 of the *2022 Annual Report.*

The foregoing list of risk factors is not exhaustive. Additional information about these risk factors is provided in the Risk Management section of the *2022 Annual Report*. Investors and others who rely on the Bank's forward-looking statements should carefully consider the above factors as well as the uncertainties they represent and the risk they entail. Except as required by law, the Bank does not undertake to update any forward-looking statements, whether written or oral, that may be made from time to time, by it or on its behalf. The Bank cautions investors that these forward-looking statements are not guarantees of future performance and that actual events or results may differ significantly from these statements due to a number of factors.

Financial Reporting Method

The Bank's consolidated financial statements are prepared in accordance with IFRS, as issued by the IASB. The financial statements also comply with section 308(4) of the *Bank Act* (Canada), which states that, except as otherwise specified by the Office of the Superintendent of Financial Institutions (Canada) (OSFI), the consolidated financial statements are to be prepared in accordance with IFRS, which represent Canadian GAAP. None of the OSFI accounting requirements are exceptions to IFRS.

The presentation of segment disclosures is consistent with the presentation adopted by the Bank for the fiscal year beginning November 1, 2021. This presentation reflects the fact that the loan portfolio comprising borrowers in the "Oil and gas" and "Pipelines" sectors as well as related activities, which had previously been reported in the Personal and Commercial segment, are now reported in the Financial Markets segment. The Bank made this change to better align the monitoring of its activities with its management structure.

In addition, a change in accounting policy, as described in the Accounting Policy Changes section of Note 1 to the consolidated financial statements, was applied retrospectively during the year ended October 31, 2022 after the International Financial Reporting Interpretations Committee (IFRIC) issued a final agenda decision on accounting for the costs of configuring or customizing a supplier's software in a cloud computing arrangement. The figures for the year ended October 31, 2021 have been adjusted to reflect this change in accounting policy.

Non-GAAP and Other Financial Measures

The Bank uses a number of financial measures when assessing its results and measuring overall performance. Some of these financial measures are not calculated in accordance with GAAP. *Regulation 52-112 respecting Non-GAAP and Other Financial Measures Disclosure* (Regulation 52-112) prescribes disclosure requirements that apply to the following measures used by the Bank:

- non-GAAP financial measures;
- non-GAAP ratios;
- supplementary financial measures;
- capital management measures.

Non-GAAP Financial Measures

The Bank uses non-GAAP financial measures that do not have standardized meanings under GAAP and that therefore may not be comparable to similar measures used by other companies. Presenting non-GAAP financial measures helps readers to better understand how management analyzes results, shows the impacts of specified items on the results of the reported periods, and allows readers to better assess results without the specified items if they consider such items not to be reflective of the underlying performance of the Bank's operations. In addition, like many other financial institutions, the Bank uses the taxable equivalent basis to calculate net interest income, non-interest income, and income taxes. This calculation method consists of grossing up certain tax-exempt income (particularly dividends) by the income tax that would have been otherwise payable. An equivalent amount is added to income taxes. This adjustment is necessary in order to perform a uniform comparison of the return on different assets regardless of their tax treatment.

The key non-GAAP financial measures used by the Bank to analyze its results are described below, and a quantitative reconciliation of these measures is presented in the tables in the Reconciliation of Non-GAAP Financial Measures section on pages 20 and 21 and in the Consolidated Results table on page 27. It should be noted that, for the year ended October 31, 2022, no specified items have been excluded from results, whereas an amount of $9 million in intangible asset impairment losses ($7 million net of income taxes) related to technology developments had been excluded as specified items for the year ended October 31, 2021.

Adjusted Net Interest Income

This item represents net interest income on a taxable equivalent basis and excluding specified items, if any. A taxable equivalent is added to net interest income so that the performance of the various assets can be compared irrespective of their tax treatment, and specified items, if any, are excluded so that net interest income can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Non-Interest Income

This item represents non-interest income on a taxable equivalent basis and excluding specified items, if any. A taxable equivalent is added to non-interest income so that the performance of the various assets can be compared irrespective of their tax treatment, and specified items, if any, are excluded so that non-interest income can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Total Revenues

This item represents total revenues on a taxable equivalent basis and excluding specified items, if any. It consists of adjusted net interest income and adjusted non-interest income. A taxable equivalent is added to total revenues so that the performance of the various assets can be compared irrespective of their tax treatment, and specified items, if any, are excluded so that total revenues can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Non-Interest Expenses
This item represents non-interest expenses excluding specified items, if any. Specified items, if any, are excluded so that non-interest expenses can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Income Before Provisions for Credit Losses and Income Taxes
This item represents income before provisions for credit losses and income taxes on a taxable equivalent basis and excluding specified items, if any. It also represents the difference between adjusted total revenues and adjusted non-interest expenses. A taxable equivalent is added to income before provisions for credit losses and income taxes so that the performance of the various assets can be compared irrespective of their tax treatment, and specified items, if any, are excluded so that income before provisions for credit losses and income taxes can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Income Taxes
This item represents income taxes on a taxable equivalent basis and excluding income taxes on specified items, if any.

Adjusted Net Income
This item represents net income excluding specified items, if any. Specified items, if any, are excluded so that net income can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Net income Attributable to Common Shareholders
This item represents net income attributable to common shareholders excluding specified items, if any. Specified items, if any, are excluded so that net income attributable to common shareholders can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Basic Earnings Per Share
This item represents basic earnings per share excluding specified items, if any. Specified items, if any, are excluded so that basic earnings per share can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Diluted Earnings Per Share
This item represents diluted earnings per share excluding specified items, if any. Specified items, if any, are excluded so that diluted earnings per share can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

The Bank also uses the below-described measures to assess its results. A quantitative reconciliation of these non-GAAP financial measures is presented in the tables of the Reconciliation of Non-GAAP Financial Measures section on pages 20 and 21 and in Table 5 on page 115.

Adjusted Non-Trading Net Interest Income
This item represents non-trading net interest income on a taxable equivalent basis. It includes revenues related to financial assets and financial liabilities associated with non-trading activities, net of interest expenses and interest income related to the financing of these financial assets and liabilities, and is used to calculate adjusted non-trading net interest margin. A taxable equivalent is added to non-trading net interest income so that the performance of the various assets can be compared irrespective of their tax treatment.

Net Interest Income From Trading Activities on a Taxable Equivalent Basis
This item represents net interest income from trading activities plus a taxable equivalent. It comprises dividends related to financial assets and liabilities associated with trading activities, net of interest expenses and interest income related to the financing of these financial assets and liabilities. A taxable equivalent is added to net interest income from trading activities so that the performance of the various assets can be compared irrespective of their tax treatment.

Non-Interest Income Related to Trading Activities on a Taxable Equivalent Basis
This item represents non-interest income related to trading activities to which a taxable equivalent amount is added. It consists of realized and unrealized gains and losses as well as interest income on securities measured at fair value through profit or loss, income from held-for-trading derivative financial instruments, changes in the fair value of loans at fair value through profit or loss, changes in the fair value of financial instruments designated at fair value through profit or loss, certain commission income, other trading activity revenues, and any applicable transaction costs. A taxable equivalent amount is added to the non-interest income related to trading activities such that the returns of different assets can be compared regardless of their tax treatment.

Trading Activity Revenues on a Taxable Equivalent Basis
This item represents trading activity revenues plus a taxable equivalent. They comprise dividends related to financial assets and liabilities associated with trading activities, net of interest expenses and interest income related to the financing of these financial assets and liabilities, realized and unrealized gains and losses, and interest income on securities measured at fair value through profit or loss, income from held-for-trading derivative financial instruments, changes in the fair value of loans at fair value through profit or loss, changes in the fair value of financial instruments designated at fair value through profit or loss, certain commission income, other trading activity revenues, and any applicable transaction costs. A taxable equivalent is added to trading activity revenues so that the performance of the various assets can be compared irrespective of their tax treatment.

Non-GAAP Ratios
The Bank uses non-GAAP ratios that do not have standardized meanings under GAAP and that may therefore not be comparable to similar measures used by other companies. A non-GAAP ratio is a ratio in which at least one component is a non-GAAP financial measure. The Bank uses non-GAAP ratios to present aspects of its financial performance or financial position.

The key non-GAAP ratios used by the Bank are described below.

Adjusted Return on Common Shareholders' Equity (ROE)
This item represents ROE excluding specified items, if any. It is adjusted net income attributable to common shareholders expressed as a percentage of average equity attributable to common shareholders. It is a general measure of the Bank's efficiency in using equity. Specified items, if any, are excluded so that ROE can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Dividend Payout Ratio
This item represents the dividend payout ratio excluding specified items, if any. It is dividends on common shares (per share amount) expressed as a percentage of adjusted basic earnings per share. This ratio is a measure of the proportion of earnings that is paid out to shareholders in the form of dividends. Specified items, if any, are excluded so that the dividend payout ratio can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Operating Leverage
This item represents operating leverage on a taxable equivalent basis and excluding specified items, if any. It is the difference between the growth rate of adjusted total revenues and the growth rate of adjusted non-interest expenses, and it measures the sensitivity of the Bank's results to changes in its revenues. Adjusted operating leverage is presented on a taxable equivalent basis so that the performance of the various assets can be compared irrespective of their tax treatment, and specified items, if any, are excluded so that the efficiency ratio can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Efficiency Ratio
This item represents the efficiency ratio on a taxable equivalent basis and excluding specified items, if any. The ratio represents adjusted non-interest expenses expressed as a percentage of adjusted total revenues. It measures the efficiency of the Bank's operations. The adjusted efficiency ratio is presented on a taxable equivalent basis so that the performance of the various assets can be compared irrespective of their tax treatment, and specified items, if any, are excluded so that the efficiency ratio can be better evaluated by excluding items that management believes do not reflect the underlying financial performance of the Bank's operations.

Adjusted Net Interest Margin, Non-Trading
This item represents the non-trading net interest margin on a taxable equivalent basis. It is calculated by dividing net interest income related to adjusted non-trading activities by average non-trading interest-bearing assets. This ratio is a measure of the profitability of non-trading activities. The adjusted non-trading net interest margin includes adjusted non-trading net interest income, which includes a taxable equivalent amount so that the performance of the various assets can be compared irrespective of their tax treatment.

Supplementary Financial Measures
A supplementary financial measure is a financial measure that: (a) is not reported in the Bank's consolidated financial statements, and (b) is, or is intended to be, reported periodically to represent historical or expected financial performance, financial position, or cash flows. The composition of these supplementary financial measures is presented in table footnotes or in the Glossary section on pages 122 to 125 of this MD&A.

Capital Management Measures

The financial reporting framework used to prepare the financial statements requires disclosure that helps readers assess the Bank's capital management objectives, policies, and processes, as set out in IFRS in IAS 1 – *Presentation of Financial Statements.* The Bank has its own methods for managing capital and liquidity, and IFRS does not prescribe any particular calculation method. These measures are calculated using various guidelines and advisories issued by OSFI, which are based on the standards, recommendations, and best practices of the Basel Committee on Banking Supervision (BCBS), as presented in the following table.

OSFI guideline or advisory	Measure
Capital Adequacy Requirements	Common Equity Tier 1 (CET1) capital ratio Tier 1 capital ratio Total capital ratio CET1 capital Tier 1 capital Tier 2 capital Total capital Risk-weighted assets Maximum credit risk exposure under the Basel asset classes
Leverage Requirements	Leverage ratio Total exposure
Total Loss Absorbing Capacity (TLAC)	Key indicators – TLAC requirements Available TLAC TLAC ratio TLAC leverage ratio
Liquidity Adequacy Requirements	Liquid asset portfolio Encumbered assets and unencumbered assets Liquidity coverage ratio (LCR) High-quality liquid assets (HQLA) Cash inflows/outflows and net cash outflows Net stable funding ratio (NSFR) Available stable funding items Required stable funding items
Global Systemically Important Banks (G-SIBs) – Public Disclosure Requirements	G-SIB indicators

Reconciliation of Non-GAAP Financial Measures

Presentation of Results – Adjusted

Year ended October 31 (millions of Canadian dollars)						2022	2021[1]
	Personal and Commercial	Wealth Management	Financial Markets	USSF&I	Other		
Net interest income	2,865	594	1,029	1,090	(307)	5,271	4,783
Taxable equivalent	–	–	229	–	5	234	181
Net interest income – Adjusted	2,865	594	1,258	1,090	(302)	5,505	4,964
Non-interest income	1,169	1,781	1,162	20	249	4,381	4,144
Taxable equivalent	–	–	48	–	–	48	8
Non-interest income – Adjusted	1,169	1,781	1,210	20	249	4,429	4,152
Total revenues – Adjusted	4,034	2,375	2,468	1,110	(53)	9,934	9,116
Non-interest expenses	2,149	1,391	1,022	344	324	5,230	4,903
Impairment losses on intangible assets[2]	–	–	–	–	–	–	(9)
Non-interest expenses – Adjusted	2,149	1,391	1,022	344	324	5,230	4,894
Income before provisions for credit losses and income taxes – Adjusted	1,885	984	1,446	766	(377)	4,704	4,222
Provisions for credit losses	97	3	(23)	66	2	145	2
Income before income taxes – Adjusted	1,788	981	1,469	700	(379)	4,559	4,220
Income taxes	474	260	112	143	(95)	894	882
Taxable equivalent	–	–	277	–	5	282	189
Income taxes related to impairment losses on intangible assets[2]	–	–	–	–	–	–	2
Income taxes – Adjusted	474	260	389	143	(90)	1,176	1,073
Net income – Adjusted	1,314	721	1,080	557	(289)	3,383	3,147
Specified items after income taxes	–	–	–	–	–	–	(7)
Net income	1,314	721	1,080	557	(289)	3,383	3,140
Non-controlling interests	–	–	–	–	(1)	(1)	–
Net income attributable to the Bank's shareholders and holders of other equity instruments	1,314	721	1,080	557	(288)	3,384	3,140
Net income attributable to the Bank's shareholders and holders of other equity instruments – Adjusted	1,314	721	1,080	557	(288)	3,384	3,147
Dividends on preferred shares and distributions on limited recourse capital notes						107	123
Net income attributable to common shareholders – Adjusted						3,277	3,024

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to the consolidated financial statements.

(2) During the year ended October 31, 2021, the Bank recorded $9 million ($7 million net of income taxes) in intangible asset impairment losses related to technology developments, which were considered a specified item.

Presentation of Basic and Diluted Earnings per Share – Adjusted

Year ended October 31 (Canadian dollars)	2022	2021[1]
Basic earnings per share	**$ 9.72**	$ 8.95
Impairment losses on intangible assets[2]	**–**	0.02
Basic earnings per share – Adjusted	**$ 9.72**	$ 8.97
Diluted earnings per share	**$ 9.61**	$ 8.85
Impairment losses on intangible assets[2]	**–**	0.02
Diluted earnings per share – Adjusted	**$ 9.61**	$ 8.87

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to the consolidated financial statements.
(2) During the year ended October 31, 2021, the Bank recorded $9 million ($7 million net of income taxes) in intangible asset impairment losses related to technology developments, which were considered a specified item.

Presentation of Non-Trading Net Interest Income – Adjusted

Year ended October 31 (millions of Canadian dollars)	2022	2021
Net interest income – Adjusted	**5,505**	4,964
Net interest income related to trading activities on a taxable equivalent basis	**911**	948
Net interest income, non-trading – Adjusted	**4,594**	4,016

Financial Disclosure

Disclosure Controls and Procedures

The Bank's financial information is prepared with the support of a set of disclosure controls and procedures (DC&P) that are implemented by the President and Chief Executive Officer (CEO) and by the Chief Financial Officer and Executive Vice-President, Finance (CFO). During the year ended October 31, 2022, in accordance with *Regulation 52-109 Respecting Certification of Disclosure in Issuers' Annual and Interim Filings* (Regulation 52-109) released by the CSA, the design and operation of these controls and procedures were evaluated to determine their effectiveness.

As at October 31, 2022, the CEO and the CFO confirmed the effectiveness of the DC&P. These controls are designed to provide reasonable assurance that the information disclosed in annual and interim filings and in other reports filed or submitted under securities legislation is recorded, processed, summarized, and reported within the time periods specified by that legislation. These controls and procedures are also designed to ensure that such information is accumulated and communicated to the Bank's management, including its signing officers, as appropriate, to allow for timely decisions regarding disclosure.

This *Annual Report* was reviewed by the Bank's Disclosure Committee, Audit Committee, and the Board of Directors (the Board), which approved it prior to publication.

Internal Control Over Financial Reporting

The internal control over financial reporting (ICFR) is designed to provide reasonable assurance that the financial information presented is reliable and that the consolidated financial statements were prepared in accordance with GAAP, which are based on IFRS, unless indicated otherwise as explained on pages 16 to 21 of this MD&A. Due to inherent limitations of internal controls, the ICFR may not prevent or detect all misstatements in a timely manner.

The CEO and the CFO oversaw the evaluation work performed on the design and operation of the Bank's ICFR in accordance with Regulation 52-109. The ICFR was evaluated in accordance with the control framework of the Committee of Sponsoring Organizations of the Treadway Commission (COSO — 2013) for financial controls and in accordance with the control framework of the Control Objectives for Information and Related Technologies (COBIT) for general information technology controls.

Based on the evaluation results, the CEO and CFO concluded, as at October 31, 2022, that there are no material weaknesses, that the ICFR is effective and provides reasonable assurance that the financial reporting is reliable, and that the Bank's consolidated financial statements were prepared in accordance with GAAP.

Changes to Internal Control Over Financial Reporting

On February 1, 2022, the Bank deployed a new integrated accounting software package, and certain processes that affect ICFR were modified. The Bank has assessed the impact of this deployment and has made sure that the key controls affected and the newly implemented controls are well designed and effective.

The CEO and CFO also undertook work that enabled them to conclude that, during the year ended October 31, 2022, aside from the above-described change, no changes were made to the ICFR that have materially affected, or are reasonably likely to materially affect, the design or operation of the ICFR.

Disclosure Committee

The Bank's Disclosure Committee assists the CEO and CFO by ensuring the design, implementation, and operation of the DC&P and ICFR. In so doing, the committee ensures that the Bank is meeting its disclosure obligations under current regulations and that the CEO and CFO are producing the requisite certifications.

Overview

Highlights

As at October 31 or for the year ended October 31 (millions of Canadian dollars, except per share amounts)	2022	2021[1]	% change
Operating results			
Total revenues	9,652	8,927	8
Income before provisions for credit losses and income taxes	4,422	4,024	10
Net income	3,383	3,140	8
Net income attributable to the Bank's shareholders and holders of other equity instruments	3,384	3,140	8
Return on common shareholders' equity[2]	18.8 %	20.7 %	
Dividend payout ratio[2]	36.8 %	31.7 %	
Earnings per share			
Basic	$ 9.72	$ 8.95	9
Diluted	9.61	8.85	9
Operating results – Adjusted[3]			
Total revenues – Adjusted[3]	9,934	9,116	9
Income before provisions for credit losses and income taxes – Adjusted[3]	4,704	4,222	11
Net income – Adjusted[3]	3,383	3,147	7
Return on common shareholders' equity – Adjusted[4]	18.8 %	20.7 %	
Dividend payout ratio – Adjusted[4]	36.8 %	31.7 %	
Operating leverage – Adjusted[4]	2.1 %	1.9 %	
Efficiency ratio – Adjusted[4]	52.6 %	53.7 %	
Earnings per share – Adjusted[3]			
Basic	$ 9.72	$ 8.97	8
Diluted	9.61	8.87	8
Common share information			
Dividends declared	$ 3.58	$ 2.84	26
Book value[2]	55.24	47.44	
Share price			
High	105.44	104.32	
Low	83.12	65.54	
Close	92.76	102.46	
Number of common shares *(thousands)*	336,582	337,912	
Market capitalization	31,221	34,622	
Balance sheet and off-balance-sheet			
Total assets	403,740	355,621	14
Loans and acceptances, net of allowances	206,744	182,689	13
Deposits	266,394	240,938	11
Equity attributable to common shareholders	18,594	16,029	16
Assets under administration[2]	616,165	651,530	(5)
Assets under management[2]	112,346	117,186	(4)
Regulatory ratios under Basel III[5]			
Capital ratios			
Common Equity Tier 1 (CET1) capital ratio	12.7 %	12.4 %	
Tier 1	15.4 %	15.0 %	
Total	16.9 %	15.9 %	
Leverage ratio	4.5 %	4.4 %	
TLAC ratio[5]	27.7 %	26.3 %	
TLAC leverage ratio[5]	8.1 %	7.8 %	
Liquidity coverage ratio (LCR)[5]	140 %	154 %	
Net stable funding ratio (NSFR)[5]	117 %	117 %	
Other information			
Number of employees – Worldwide	29,509	26,920	10
Number of branches in Canada	378	384	(2)
Number of banking machines in Canada	939	927	1

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to the consolidated financial statements.
(2) See the Glossary section on pages 122 to 125 for details on the composition of these measures.
(3) See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP financial measures.
(4) See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP ratios.
(5) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.

About National Bank

The Bank carries out its activities in four business segments: Personal and Commercial, Wealth Management, Financial Markets as well as U.S. Specialty Finance and International (USSF&I), which comprises the activities of the Credigy Ltd. (Credigy) and Advanced Bank of Asia Limited (ABA Bank) subsidiaries. Other operating activities, certain specified items, Treasury activities, and the operations of the Flinks Technology Inc. (Flinks) subsidiary are grouped in the *Other* heading of segment results. Each reportable segment is distinguished by services offered, type of clientele, and marketing strategy. For additional information, see the Business Segment Analysis section of this MD&A.

Objectives and 2022 Results

When setting its objectives, the Bank aims for a realistic challenge in the prevailing business environment by considering such factors as changes in banking industry financial results as well as the Bank's business development plan. When the Bank sets its medium-term objectives, it does not take into consideration specified items, if any, which are not reflective of the underlying financial performance of the Bank's operations. Management therefore excludes specified items when assessing the Bank's performance against its objectives.

In fiscal 2022, the Bank recorded $3,383 million in net income compared to $3,140 million in fiscal 2021, and its diluted earnings per share stood at $9.61 compared to $8.85 in fiscal 2021. The Bank's fiscal 2022 return on common shareholders' equity (ROE) was 18.8% versus 20.7% in fiscal 2021. Its diluted earnings per share stood at $9.61 in fiscal 2022, an 8% increase from adjusted diluted earnings per share of $8.87 in fiscal 2021. Furthermore, the 18.8% ROE in fiscal 2022 compares to an adjusted ROE of 20.7% in fiscal 2021.

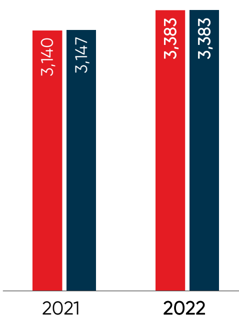
The following table compares the Bank's medium-term objectives with its fiscal 2022 results.

	Medium-Term Objectives (%)	2022 Results
Growth in diluted earnings – Adjusted[1]	5 – 10	8.3%
ROE – Adjusted[2]	15 – 20	18.8%
Dividend payout ratio – Adjusted[2]	40 – 50	36.8%
CET1 capital ratio[3]	Strong level	12.7%
Leverage ratio[3]	Strong level	4.5%

The Bank's financial results met all of its medium-term objectives, except for the dividend payout ratio. Year over year, adjusted diluted earnings per share grew 8%, which is within the target range, and was driven by strong revenue growth in every business segment, growth that more than offset increases in non-interest expenses and in provisions for credit losses. For fiscal 2022, adjusted ROE was in the upper range of the target objective. The CET1 capital ratio and the leverage ratio, at 12.7% and 4.5%, respectively, also met the objectives. As for the adjusted dividend payout ratio, it was below the target distribution range given strong growth in net income and the interruptions to dividend increases prescribed by OSFI between March 13, 2020 and November 4, 2021.

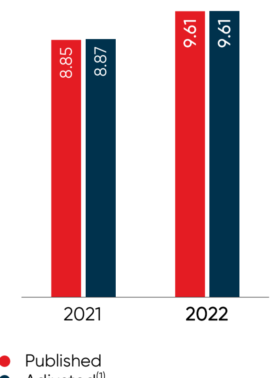
The Bank also examines its performance using the efficiency ratio and operating leverage. For fiscal 2022, the Bank's efficiency ratio stood at 54.2% compared to 54.9% in fiscal 2021. Its adjusted efficiency ratio for fiscal 2022 was 52.6%, a 1.1 percentage point improvement from 53.7% in fiscal 2021. These improvements are reflective of disciplined cost management by all the Bank's segments. Also for fiscal 2022, operating leverage and adjusted operating leverage were positive, at 1.4% and 2.1%, respectively.

Net Income
Year ended October 31
(millions of Canadian dollars)



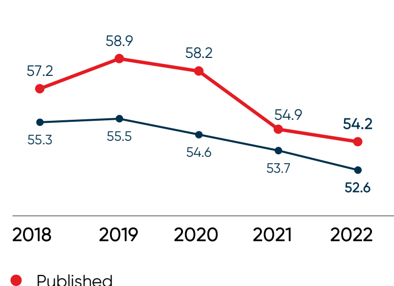
- Published
- Adjusted[1]

Diluted Earnings Per Share
Year ended October 31
(Canadian dollars)



- Published
- Adjusted[1]

Efficiency Ratio[4]
Year ended October 31
(%)



- Published
- Adjusted[2]

(1) See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP financial measures.
(2) See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP ratios.
(3) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.
(4) See the Glossary section on pages 122 to 125 for details on the composition of these measures.

Dividends

For fiscal 2022, the Bank declared $1,206 million in dividends to common shareholders (2021: $958 million), representing 36.8% of net income attributable to common shareholders (2021: 31.7%).

Solid Capital Levels(1)

As at October 31, 2022, the Bank's CET1, Tier 1, and Total capital ratios were, respectively, 12.7%, 15.4% and 16.9%, compared to ratios of, respectively, 12.4%, 15.0% and 15.9% as at October 31, 2021. All of the capital ratios have therefore increased since October 31, 2021, essentially due to net income net of dividends and to common share issuances under the Stock Option Plan. These factors were partly offset by growth in RWA, common share repurchases, and the impact of the transitional measures applicable to ECL provisioning, of which the scaling factor decreased from 50% to 25%. The increase in the Tier 1 capital ratio was also due to the $500 million issuance of limited recourse capital notes, i.e., Limited Recourse Capital Notes (LRCN) – Series 3, on September 8, 2022. The increase in the Total capital ratio was also due to the $750 million issuance of medium-term notes on July 25, 2022. As at October 31, 2022, the leverage ratio was 4.5% compared to 4.4% as at October 31, 2021. The growth in Tier 1 capital was partly offset by growth in total exposure, which will continue to benefit, until April 1, 2023, from the temporary measure permitted by OSFI with respect to the exclusion of exposures from central bank reserves.

High-Quality Loan Portfolio

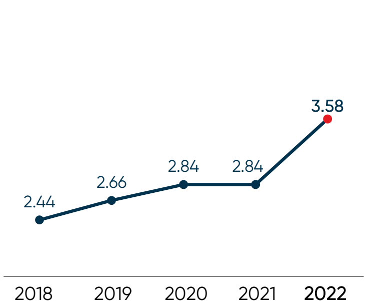
Loans and acceptances, net of allowances for credit losses, accounted for 51% of the Bank's total assets and amounted to $206.7 billion as at October 31, 2022. For fiscal 2022, the Bank recorded $145 million in provisions for credit losses compared to $2 million in fiscal 2021. This increase was due to higher provisions for credit losses on non-impaired loans recorded to reflect a less favourable macroeconomic environment in fiscal 2022 and to a slight deterioration in certain risk parameters, and was also due to an increase in provisions for credit losses on purchased or originated credit-impaired (POCI) loans, as there had been higher reversals on certain portfolios recorded in fiscal 2021. These increases were tempered by lower provisions for credit losses on impaired loans excluding POCI loans, particularly Commercial Banking loans and Financial Markets loans, partly offset by higher provisions for credit losses on the impaired ABA Bank loans recorded to reflect the end of COVID-19 relief measures that had been granted to clients. Gross impaired loans totalled $1,271 million as at October 31, 2022 compared to $1,126 million as at October 31, 2021 and represented 0.61% of total loans and acceptances.

Risk Profile

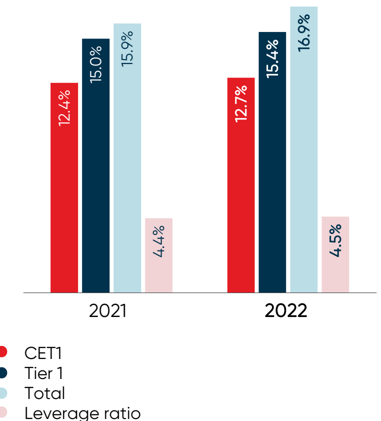
As at October 31 or for the year ended October 31
(millions of Canadian dollars)

	2022	2021
Provisions for credit losses	145	2
Provisions for credit losses as a % of average loans and acceptances(2)	0.07 %	– %
Provisions for credit losses on impaired loans excluding POCI loans as a % of average loans and acceptances(2)	0.07 %	0.11 %
Net write-offs as a % of average loans and acceptances(2)	0.10 %	0.09 %
Gross impaired loans as a % of total loans and acceptances(2)	0.61 %	0.61 %
Gross impaired loans	1,271	1,126
Net impaired loans	1,030	836

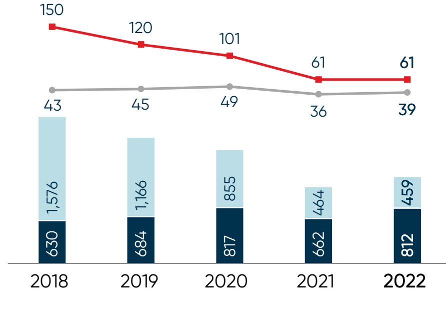
Annual Dividend Per Common Share
Year ended October 31
(Canadian dollars)



Evolution of Regulatory Ratios Under Basel III(1)
As at October 31



Gross Impaired Loans
As at October 31
(millions of Canadian dollars)



(1) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.
(2) See the Glossary section on pages 122 to 125 for details on the composition of these measures.

Economic Review and Outlook

Global Economy

After a somewhat late start, the cycle of tightening global monetary policy seems well under way, with more and more central banks now taking a more restrictive approach to rein in inflation. While this trend reversal offers promise of greater price stability in the future, the economic impacts will still be significant, especially if the reversal comes at a time when growth has already slowed considerably in several regions. In the eurozone, for example, annualized GDP growth was only 0.7% in the third quarter of 2022, since soaring energy costs are being felt and resulting in a decrease in actual compensation. While the energy situation improved slightly in the third quarter of 2022, several signs are pointing to a recession starting in the fourth quarter of 2022. Elsewhere in the world, emerging markets continue to feel the brunt of a strong U.S. dollar, which is putting upward pressure on inflation and making it more difficult to repay loans in U.S. dollars. All the while, China has continued to feel the economic impacts of its zero-COVID policy at a time when weak consumer demand and sluggish real estate markets can no longer be offset by higher exports. Against this backdrop, the global economy is expected to grow by only 2.2%(1) in 2023, on the heels of 3.1%(1) growth in 2022.

The last time that the U.S. Federal Reserve (the Fed) raised interest rates, bringing the target range between 3.75 and 4.00%, Jerome Powell, Chair of the Fed, stated that data published since the last Fed meeting justified having a higher terminal rate than what had previously been presented. And yet, there are increasing signs that an economic slowdown lies ahead. While GDP figures for the third quarter of 2022 showed that growth is rebounding, this is mainly due to international trade since private domestic demand is weakening. More specifically, residential investment decreased for a sixth consecutive quarter—something not seen since the Great Recession of 2008-2009. Inflation continues to hover at abnormally high levels, although there are now many signs pointing to a turnaround, especially given the manufacturing sector slowdown, high inventory levels, a sharp decline in shipping costs, lower selling prices by Chinese producers, and a strong U.S. dollar. Where services are concerned, it may take longer to return inflation to a reasonable level, although there is evidence suggesting far fewer new hires in an environment characterized by anemic growth, which will help to reduce wage pressures. Given this context, the central bank should be able to end its monetary tightening cycle no later than for the first monetary policy meeting in 2023. Otherwise, a recession is practically unavoidable in 2023. Moreover, even if the Fed changes direction, this would not prevent a major slowdown in growth next year. We anticipate a difficult first half next year and growth of only 0.2%(1) for 2023.

Canadian Economy

In Canada, efforts to soft-land the economy after a period of overheating are continuing. So far, indicators are moving in the right direction for the Bank of Canada, which suggests that we are approaching the terminal rate in this extremely aggressive tightening cycle. In fact, the labour market is showing signs of moderation: private-sector and full-time jobs have been at a standstill for several months, and hiring intentions are declining, suggesting that there will be no rebound in the short term. Inflationary pressures are less acute and widespread than earlier this year. Nevertheless, given the rushed response and the transmission lag for monetary policy, it is normal for observers to be nervous. Unfortunately, we will only know in hindsight if the response was too aggressive. One thing is certain: we are already seeing a notable slowdown in the real estate market, which is leading to extremely rapid real estate deflation. In our view, it will not be necessary to keep interest rates at current levels for long to cool down inflation; consequently, we expect that the central bank will have to lower them in the second half of next year. In light of this monetary tightening, we anticipate an anemic growth rate of 0.7%(1) in 2023, as consumers will be hit simultaneously by a loss of purchasing power, a negative wealth effect, and interest payment shock.

Quebec Economy

Quebec's economy, which had experienced a spectacular post-pandemic recovery compared to the country as a whole, lost its lead in July 2022 after posting the fourth monthly decline in a row. But that is not overly concerning for now, since this decline has not had a significant adverse effect on the labour market, which is still one of the most stable in the country. The unemployment rate reached 4.1% in October 2022, which is the lowest in all of the provinces, while the job vacancy rate is among the highest in the country. We also see some encouraging structural factors for the Quebec economy, such as a highly diversified economy, fiscal support from the Quebec government, and low electricity costs. Moreover, Quebec households are in a better financial situation (lower financial leverage and higher savings rate), mainly because housing accessibility is significantly better than in the rest of the country. They are therefore less vulnerable to the recent interest rate increase. Our forecast for growth in 2023 is 0.7%(1), in line with Canada as a whole, despite less favourable demographic factors.

(1) GDP growth forecasts, National Bank Financial's Economics and Strategy group

Financial Analysis

Consolidated Results

Year ended October 31 (millions of Canadian dollars)	2022	2021[1]	% change
Operating results			
Net interest income	5,271	4,783	10
Non-interest income	4,381	4,144	6
Total revenues	9,652	8,927	8
Non-interest expenses	5,230	4,903	7
Income before provisions for credit losses and income taxes	4,422	4,024	10
Provisions for credit losses	145	2	
Income before income taxes	4,277	4,022	6
Income taxes	894	882	1
Net income	3,383	3,140	8
Diluted earnings per share *(dollars)*	9.61	8.85	9
Taxable equivalent basis[2]			
Net interest income	234	181	
Non-interest income	48	8	
Income taxes	282	189	
Impact of taxable equivalent basis on net income	–	–	
Specified items[2]			
Impairment losses on intangible assets	–	(9)	
Specified items before income taxes	–	(9)	
Income taxes on specified items	–	(2)	
Specified items after income taxes	–	(7)	
Operating results – Adjusted[2]			
Net interest income – Adjusted	5,505	4,964	11
Non-interest income – Adjusted	4,429	4,152	7
Total revenues – Adjusted	9,934	9,116	9
Non-interest expenses – Adjusted	5,230	4,894	7
Income before provisions for credit losses and income taxes – Adjusted	4,704	4,222	11
Provisions for credit losses	145	2	
Income before income taxes – Adjusted	4,559	4,220	8
Income taxes – Adjusted	1,176	1,073	10
Net income – Adjusted	3,383	3,147	7
Diluted earnings per share – Adjusted *(dollars)*	9.61	8.87	8
Average assets[3]	393,847	363,506	8
Average loans and acceptances[3]	194,340	172,323	13
Average deposits[3]	258,929	236,229	10
Operating leverage[4]	1.4 %	6.4 %	
Operating leverage – Adjusted[5]	2.1 %	1.9 %	
Efficiency ratio[4]	54.2 %	54.9 %	
Efficiency ratio – Adjusted[5]	52.6 %	53.7 %	
Net interest margin, non-trading - Adjusted[5]	1.96 %	1.90 %	

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to the consolidated financial statements.
(2) See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP financial measures.
(3) Represents an average of the daily balances for the period.
(4) See the Glossary section on pages 122 to 125 for details on the composition of these measures.
(5) See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP ratios.

Analysis of Consolidated Results

Financial Results
For fiscal 2022, the Bank's net income totalled $3,383 million, an 8% increase from $3,140 million in fiscal 2021. Excellent performance in all of the business segments, driven by revenue growth, contributed to this increase in net income, which was partly offset by higher provisions for credit losses recorded in part to reflect a deterioration in the macroeconomic outlook in fiscal 2022. Income before provisions for credit losses and income taxes totalled $4,422 million for fiscal 2022, a 10% year-over-year increase that was due to the revenue growth in all of the business segments.

Total Revenues
For fiscal 2022, the Bank's total revenues amounted to $9,652 million versus $8,927 million in fiscal 2021, a $725 million or 8% increase that was driven by the revenue growth across all of the Bank's business segments. For additional information on total revenues, see Table 2 on page 114. The fiscal 2022 adjusted total revenues grew $818 million or 9% year over year.

Net Interest Income
For fiscal 2022, net interest income totalled $5,271 million, up $488 million or 10% from $4,783 million in fiscal 2021 (see Table 3, page 114). As for the adjusted net interest income in fiscal 2022, it amounted to $5,505 million, up 11% from $4,964 million in fiscal 2021.

In the Personal and Commercial segment, net interest income totalled $2,865 million in fiscal 2022, a $318 million or 12% year-over-year increase owing mainly to growth in loans and deposits, which rose 11% and 7%, respectively, year over year. The loan growth came mainly from mortgage credit and business lending. The increase in net interest income was also due to a higher net interest margin, which rose to 2.14% in 2022 from 2.11% in 2021 as a result of interest rate hikes, and that was primarily attributable to the deposit margin. In the Wealth Management segment, net interest income totalled $594 million in fiscal 2022, a 33% year-over-year increase owing to higher interest rates, growth in loan and deposit volumes, and the deposit margin.

In the Financial Markets segment, net interest income on a taxable equivalent basis was down $4 million in fiscal 2022 compared to fiscal 2021, mainly due to trading activities, and should be examined together with the other items of trading activity revenues. In the USSF&I segment, net interest income rose $183 million or 20% year over year owing to loan and deposit growth at the ABA Bank subsidiary in fiscal 2022 as well as to an increase in the Credigy subsidiary's net interest income given growth in loan portfolios and solid performance in certain portfolios.

Non-Interest Income
The Bank's non-interest income amounted to $4,381 million in fiscal 2022, up $237 million or 6% from $4,144 million in fiscal 2021. For additional information on non-interest income, see Table 4 on page 115.

For fiscal 2022, revenues from underwriting and advisory fees were down 22% year over year, notably due to capital markets activities in the Financial Markets segment. Revenues from securities brokerage commissions were down 14% year over year, essentially due to a decrease in commission-generating transactions in the Wealth Management segment. Combined, mutual fund revenues and revenues from investment management and trust service fees totalled $1,584 million, a $121 million year-over-year increase owing to growth in average assets under administration and under management as a result of net inflows into various solutions and of stock market performance in the first half of 2022.

Credit fee revenues and revenues from acceptances and letters of credit and guarantee were down $16 million year over year, as greater business activity at Commercial Banking was more than offset by a decrease in the activities of Financial Markets. Conversely, card revenues and revenues from deposits and payment service charges rose 26% and 9%, respectively, as an upswing in economic activity led to greater transaction volume during fiscal 2022.

Non-interest income related to trading activity on a taxable equivalent basis totalled $596 million, up from $290 million in fiscal 2021 (Table 5, page 115). Including the portion recorded in net interest income, trading activity revenues on a taxable equivalent basis amounted to $1,507 million in fiscal 2022, a $269 million year-over-year increase that was essentially driven by equity securities revenues from the Financial Markets segment. Conversely, trading activity revenues on a taxable equivalent basis from the Bank's other business segments decreased year over year.

For fiscal 2022, gains on non-trading securities were down $38 million year over year, in part due to Treasury activities, while insurance revenues were up $27 million year over year, reflecting a revision to actuarial reserves. Also up year over year were foreign exchange revenues and the share in the net income of associates and joint ventures, which rose $9 million and $5 million, respectively. Other revenues amounted to $242 million in fiscal 2022, an $83 million decrease that was notably due to a gain realized on the disposal of certain loan portfolios and to a more favourable impact of the fair value remeasurements of certain Credigy loan portfolios in fiscal 2021. In addition, in fiscal 2021, the Other revenues item had included a $33 million gain on the remeasurement of the previously held equity interest in Flinks and a $30 million loss related to the fair value measurement of the Bank's equity interest in AfrAsia Bank Limited (AfrAsia).

Non-Interest Expenses

For fiscal 2022, non-interest expenses stood at $5,230 million, up $327 million or 7% from fiscal 2021 (Table 6, page 116). In fiscal 2021, non-interest expenses had included $9 million in intangible asset impairment losses. The fiscal 2022 non-interest expenses, compared to $4,894 million in adjusted non-interest expenses, were up $336 million or 7%.

Compensation and employee benefits totalled $3,284 million in fiscal 2022, an 8% year-over-year increase that was notably due to wage growth and a greater number of employees as well as to the variable compensation associated with revenue growth. An increase in technology expenses, including amortization, was attributable to significant investments made to support the Bank's technological evolution and the business development plan. In addition, fiscal 2022 travel and business development expenses increased year over year as activities with clients resumed. These higher expenses were tempered by decreases in certain expenses; in particular, there was a $20 million reversal of the provision for the compensatory tax on salaries paid in Quebec during the first quarter of 2022 as well as a decrease in COVID-19 response expenses, which had been higher during fiscal 2021. Furthermore, a portion of the overall increase in non-interest expenses was attributable to the Flinks acquisition at the end of fiscal 2021.

Provisions for Credit Losses

For fiscal 2022, the Bank recorded $145 million in provisions for credit losses compared to $2 million in fiscal 2021 (Table 7, page 117). This increase was mainly attributable to $1 million in provisions for credit losses on non-impaired loans during fiscal 2022 compared to the $155 million in reversals of allowances for credit losses recorded during fiscal 2021. The macroeconomic outlook deteriorated in the second half of fiscal 2022, notably due to high inflationary pressure, geopolitical instability, and global supply chain disruptions, whereas in fiscal 2021, the macroeconomic outlook had been more favourable. Provisions for credit losses on impaired loans excluding POCI[1] loans were down $45 million in fiscal 2022, mainly those in Commercial Banking and Financial Markets, which decreased $13 million and $77 million, respectively. These decreases were partly offset by a $10 million increase in Personal Banking's provisions for credit losses (including credit card receivables) and a $35 million increase in USSF&I's provisions for credit losses (excluding POCI loans), essentially attributable to the ABA Bank subsidiary, where COVID-19 relief measures that had been granted to customers ended. The provisions for credit losses on Credigy's POCI loans also increased, rising $32 million given the favourable remeasurements of certain portfolios during fiscal 2021. At $138 million for fiscal 2022, the provisions for credit losses on impaired loans excluding POCI loans[1] decreased and represented 0.07% of average loans and acceptances, down from 0.11% in fiscal 2021.

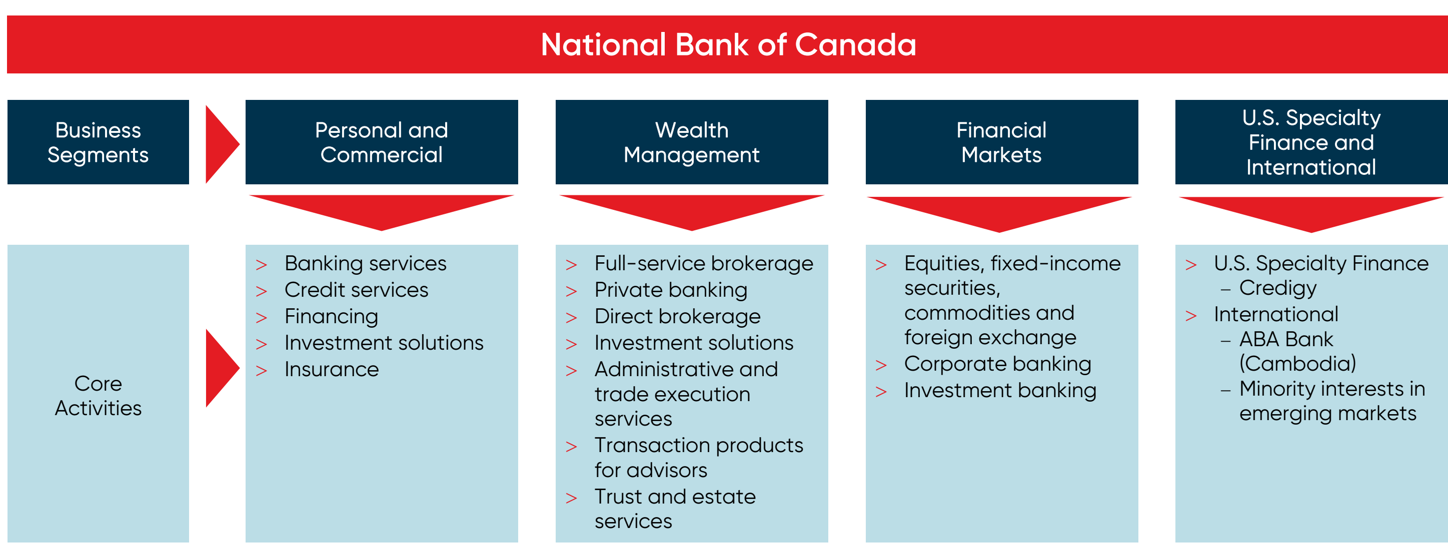
Income Taxes

Detailed information about the Bank's income taxes is provided in Note 24 to the consolidated financial statements. For fiscal 2022, income taxes stood at $894 million, representing an effective tax rate of 21%, which compares to income taxes of $882 million and a 22% effective tax rate in fiscal 2021. The change in effective tax rates stems mainly from a higher level of tax-exempt dividend income during fiscal 2022.

(1) See the Glossary section on pages 122 to 125 for details on the composition of these measures.

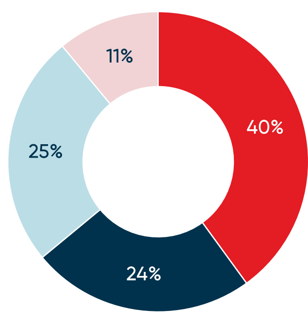
Business Segment Analysis

The Bank carries out its activities in four business segments, which are defined below. For presentation purposes, other activities are grouped in the *Other* heading. Each reportable segment is distinguished by services offered, type of clientele, and marketing strategy.



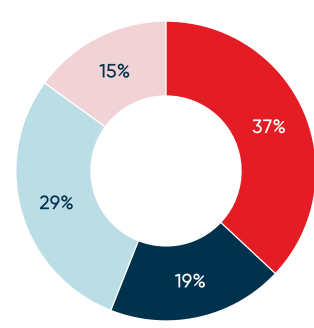
Other: Treasury activities, liquidity management, Bank funding, asset/liability management, Flinks subsidiary activities (a fintech specialized in financial data aggregation and distribution), and corporate units.

Total Revenues by Business Segment[(1)]
Year ended October 31, 2022



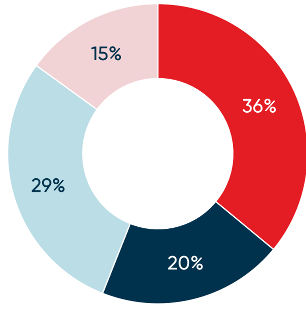
- Personal and Commercial (2021: 40%)
- Wealth Mangement (2021: 24%)
- Financial Markets (2021: 25%)
- USSF&I (2021: 11%)

Income Before Provisions for Credit Losses and Income Taxes by Business Segment[(1)]
Year ended October 31, 2022



- Personal and Comemrcial (2021: 36%)
- Wealth Mangement (2021: 20%)
- Financial Markets (2021: 29%)
- USSF&I (2021: 15%)

Net Income by Business Segment[(1)]
Year ended October 31, 2022



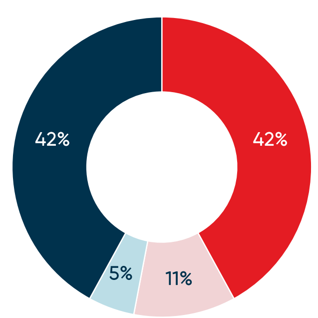
- Personal and Commercial (2021: 35%)
- Wealth Management (2021: 19%)
- Financial Markets (2021: 29%)
- USSF&I (2021 : 17%)

(1) Excluding the *Other* heading.

Personal and Commercial

The Personal and Commercial segment meets the financial needs of close to 2.6 million individuals and over 145,000 businesses across Canada. These clients entrust the Bank to manage, invest, and safeguard their assets and to finance their projects. Clients turn to the Bank's experienced advisors who take the time to understand their specific needs and help them reach their financial goals. Thanks to the Bank's convenient self-banking channels, 378 branches, and 939 banking machines across Canada, clients can do their daily banking whenever and wherever they wish.

Total Revenues by Category
Year ended October 31, 2022



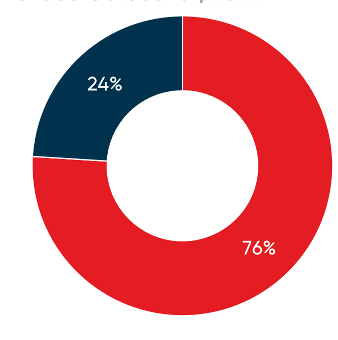
- Retail (2021: 46%)
- Payment Solutions (2021: 11%)
- Insurance (2021: 5%)
- Commercial Banking (2021: 38%)

$4,034 million
Total revenues

$1,885 million
Income before provisions for credit losses and income taxes

$1,314 million
Net income

Total Revenues by Geographic Distribution
Year ended October 31, 2022



- Province of Quebec (2021: 75%)
- Other provinces (2021: 25%)

Personal Banking
Personal Banking provides a complete range of financing and investment products and services to help clients reach their financial goals throughout every stage in their lives. It offers everyday transaction solutions, mortgage loans and home equity lines of credit, consumer loans, payment solutions, savings and investment solutions as well as a range of insurance products.

Commercial Banking
Commercial Banking serves the financial needs of small- and medium-sized enterprises (SMEs) and large corporations, helping them to achieve growth. It offers a full line of financial products and services, including credit, deposit, and investment solutions as well as international trade, foreign exchange transaction, payroll, cash management, insurance, electronic transaction, and complementary services. With deep roots in the business community for over 160 years, Commercial Banking is the leading bank in the Quebec market.

Key Success Factors

- Strong penetration in our core Quebec market thanks to a full range of personal and commercial banking services.
- Well-established and enduring client relationships grounded in an ability to provide both advice and a full range of solutions tailored to specific client needs.
- Vast sales force in Quebec, consisting of both generalists and specialists, positioning the Bank to offer the best advice to clients.
- Unmatched closeness to Quebec entrepreneurs, with leading expertise in business lending and risk management solutions.
- Ability to meet all the needs facing businesses and entrepreneurs in collaboration with other Bank segments.

Economic and Market Review

In Canada, efforts continue to soft-land the economy after a period of overheating. Interest rate hikes brought real estate activity to an abrupt halt, after it had reached record levels since the start of the pandemic and was characterized by soaring house prices. With house hunters now having less buying power, prices across Canada are undergoing a correction, generating more of an impact on household wealth already falling as a result of weak financial market performance. However, many people seized opportunities that arose during the pandemic to get their financial house in order. In fact, some consumers have amassed excess savings that can be used to cushion the blow of the rising cost of living and higher interest rates. Personal and corporate bankruptcies are on the rise, even though they remain below pre-pandemic levels. The labour market is showing signs of moderation, with full-time private-sector employment stagnating in recent months and hiring intentions slowing down—which does not point to a turnaround in the short-term. Corporate investment remains strong for now, but activity may slow down due to higher funding costs and the uncertain economic outlook.

The economic environment in 2022 and the outlook for 2023 are discussed in more detail in the Economic Review and Outlook section on page 26.

Objectives and Strategic Priorities

The Personal and Commercial segment is targeting growth by becoming a more simple, efficient bank focused on constantly improving the client experience.

	2022 Achievements and Highlights	2023 Priorities
Accelerate net client acquisition	> Delivered unparalleled performance in terms of total client acquisition. > Enhanced our visibility and proximity through targeted campaigns. > Continued our client acquisition strategy by intensifying coverage in promising markets and among high-growth target clients such as newcomers, professionals, Gen Z, millennials, and SMEs. > Strengthened the synergies between our business units to achieve even greater acquisition success. > Strengthened ties between Private Banking (PB1859) and Commercial Banking using a mixed approach and a market presence that is delivering impressive results in terms of the engagement of our commercial and high net worth clients. > Enhanced our preferential offering to our strategic client sectors, such as professionals. > Continued to expand financial literacy content in response to common concerns arising in the current economic environment. > Improved our digital approval processes for our signature products (bank accounts and credit cards).	> Achieve greater coverage in promising markets and high-growth client segments. > Further develop a distinctive offering for clients who are in both our PB1859 and Commercial Banking sectors by adding differentiating revenue-generating components such that they can go to market together. > Continue our acquisition efforts by further developing our digital acquisition capabilities and client eligibility and by focusing branch efforts on advisory service. > Simplify and modernize our product offering such that it is better tailored to client needs. > Grow the Bank's brand across Canada and demonstrate our ESG impact.
Improve client engagement	> Implemented a new, more client-centric and advisory-driven distribution approach. > Enhanced the capabilities of the transactional platform and the mobile app to deliver a simpler, safer, and more intuitive digital experience for all our clients. > Personalized client interaction with the use of client data, which helps us to proactively contact clients, through both assisted and unassisted channels, during key life moments. > Deployed an advisory and support strategy to clients most affected by market fluctuations in the volatile economic environment, particularly to help them manage their liquidity. > Improved our digital investment platform, notably though the Enhanced Investing Experience, by adding several self-serve capabilities that promote client autonomy.	> Develop account and market strategies designed to raise the penetration rate of both Commercial Banking and PB1859 clients. > Increase the quality of our advice and our value among clients by continuing to develop our distribution network and personalize our contacts. > Achieve greater synergy by improving the penetration rate of banking services among our investor clients. > Enhance our payment facilities offering. > Optimize client experience by modernizing the most frequently used cash management capabilities. > Further develop our key technological capacities in the areas of account management and client profile services.

	2022 Achievements and Highlights	2023 Priorities
Improve efficiency	> Simplified the transactional banking capabilities most frequently used by personal and commercial clients on our priority approaches by ensuring an integrated experience among the channels. > Finalized the automation of the financing process for all Commercial Banking segments, thereby providing a simple and quick experience. > Simplified the customer journey, both for retail clients (account opening and payments) and commercial clients (account opening, financing, and cash management). > Aligned our product offering to evolving market needs (transactional, card, payment, and cash management solutions).	> Continue simplifying the customer journey for priority clients as well as our business processes. > Bolster our digital capabilities such that it promotes client autonomy and simplifies our processes. > Maximize the support structure provided to our sales force by optimizing the operational support offered to our client-facing employees. > Continue modernizing our range of cash management offerings, adapting them to client needs and helping business clients manage their cash cycle.

Segment Results – Personal and Commercial

Year ended October 31 (millions of Canadian dollars)	2022		2021[1]		% change
Net interest income	2,865		2,547		12
Non-interest income	1,169		1,068		9
Total revenues	4,034		3,615		12
Non-interest expenses	2,149		2,008		7
Income before provisions for credit losses and income taxes	1,885		1,607		17
Provisions for credit losses	97		40		
Income before income taxes	1,788		1,567		14
Income taxes	474		416		14
Net income	1,314		1,151		14
Net interest margin[2]	2.14	%	2.11	%	
Average interest-bearing assets[2]	133,754		120,956		11
Average assets[3]	140,514		126,637		11
Average loans and acceptances[3]	139,749		125,917		11
Net impaired loans[2]	193		213		(9)
Net impaired loans as a % of total loans and acceptances[2]	0.1	%	0.2	%	
Average deposits[3]	82,005		76,442		7
Efficiency ratio[2]	53.3	%	55.5	%	

(1) For the year ended October 31, 2021, certain amounts have been reclassified, in particular amounts of the loan portfolio of borrowers in the "Oil and gas" and "Pipelines" sectors as well as related activities, which were transferred from the Personal and Commercial segment to the Financial Markets segment. Moreover, certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements (for additional information, see Note 1 to the consolidated financial statements).
(2) See the Glossary section on pages 122 to 125 for details on the composition of these measures.
(3) Represents an average of the daily balances for the period.

Financial Results

In the Personal and Commercial segment, net income totalled $1,314 million in fiscal 2022 compared to $1,151 million in fiscal 2021, a 14% increase that was due to $419 million in total revenue growth, partly offset by higher provisions for credit losses. The segment's income before provisions for credit losses and income taxes totalled $1,885 million in fiscal 2022, up 17% year over year. The growth in total revenues was driven by a $318 million increase in net interest income and a $101 million increase in non-interest income. The increase in net interest income came mainly from growth in personal and commercial loans and deposits. In addition, the successive interest rate increases that occurred in fiscal 2022 had a favourable impact on net interest margin, which rose to 2.14% from 2.11% in fiscal 2021, an increase attributable mainly to the deposit margin.

For fiscal 2022, the Personal and Commercial segment's non-interest expenses stood at $2,149 million, a 7% year-over-year increase that was mainly due to higher compensation and employee benefits (given wage growth and a greater number of employees), to greater investments made as part of the segment's technological evolution, and to higher operations support charges. Furthermore, travel and business development costs increased as activities with clients resumed. At 53.3%, the segment's 2022 efficiency ratio improved by 2.2 percentage points from 55.5% in 2021.

The segment recorded $97 million in provisions for credit losses in fiscal 2022, which is $57 million more than the $40 million recorded in fiscal 2021. This increase came mainly from higher provisions for credit losses on non-impaired Personal Banking loans (including credit card receivables) recorded to reflect less favourable macroeconomic conditions, whereas, in fiscal 2021, a more favourable macroeconomic environment had led to significant reversals of allowances for credit losses on non-impaired loans. These increases were tempered by lower provisions for credit losses on impaired Commercial Banking loans as well as by a decrease in provisions for credit losses on non-impaired Commercial Banking loans resulting from more favourable risk parameters in fiscal 2022.

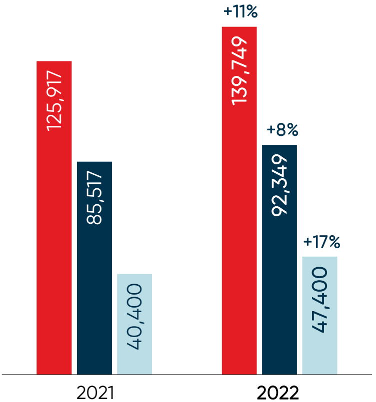
Personal Banking

Personal Banking's total revenues amounted to $2,359 million in fiscal 2022, a 6% increase from $2,234 million in fiscal 2021. Its net interest income increased, as there was 8% growth in loan volumes, 4% growth in deposit volumes and a higher deposit margin, partly offset by a lower net interest margin on loans. Non-interest income was also up, rising $53 million year over year, essentially due to higher credit card revenues given a notable increase in purchasing volume, higher insurance revenues (reflecting a revision to actuarial reserves), and higher internal commission revenues related to the distribution of Wealth Management products. For fiscal 2022, Personal Banking's non-interest expenses rose $105 million year over year, mainly due to higher compensation and employee benefits (given wage growth and a greater number of employees), to greater investments made as part of the segment's technological evolution, and to higher operations support charges.

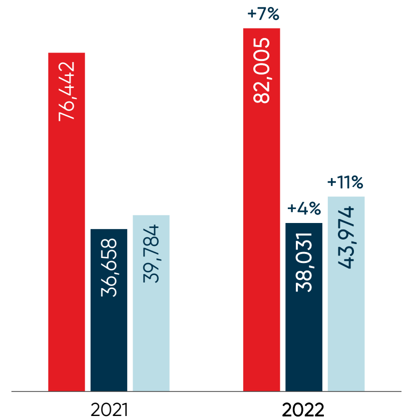
Commercial Banking

Commercial Banking's total revenues amounted to $1,675 million in fiscal 2022, rising 21% from $1,381 million in fiscal 2021. Net interest income was up, essentially due to 17% growth in loans and 11% growth in deposits as well as to a higher net interest margin as interest rates were raised successively during fiscal 2022. Non-interest income was also up, rising $48 million compared to fiscal 2021, mainly due to increases in revenues from bankers' acceptances, in revenues from derivative financial instruments, and in revenues from foreign exchange activities. For fiscal 2022, Commercial Banking's non-interest expenses rose $36 million year over year, mainly due to higher compensation and employee benefits (given wage growth and a greater number of employees), to higher operations support charges, and to higher travel and business development costs as activities with clients resumed.

Average Loans and Acceptances
Year ended October 31
(millions of Canadian dollars)



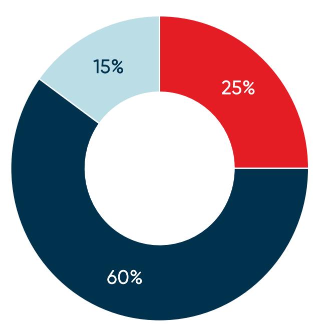
Average Deposits
Year ended October 31
(millions of Canadian Dollars)



Wealth Management

As a leader in Quebec and firmly established across Canada, the Wealth Management segment serves all market segments by emphasizing advisory-based service and close client relationships. It delivers a full range of wealth management products and solutions through a multi-channel distribution network and a differentiated business model. Wealth Management also provides services to independent advisors and institutional clients.

Total Revenues by Category
Year ended October 31, 2022



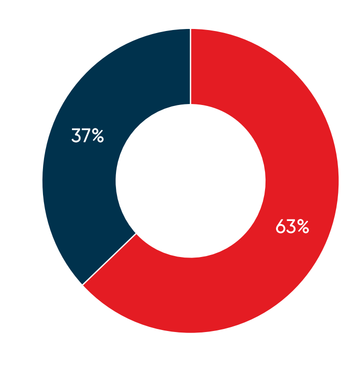
- Net interest income (2021: 21%)
- Fee-based services (2021: 61%)
- Transaction-based and other revenues (2021: 18%)

$2,375 million
Total revenues

$984 million
Income before provisions for credit losses and income taxes

$721 million
Net income

Total Revenues by Geographic Distribution
Year ended October 31, 2022



- Province of Quebec (2021: 63%)
- Other provinces (2021: 37%)

Full-Service Brokerage
Drawing on the largest network of investment advisors in Quebec, National Bank Financial Wealth Management (NBFWM) provides wealth management advisory services through 800-plus advisors at close to 100 service points across Canada. Its advisors serve approximately 400,000 retail clients, proposing portfolio management services, financial and succession planning services, and insurance services while working in close collaboration with other segments of the Bank.

Private Banking
Private Banking 1859 (PB1859) offers highly personalized wealth management services and advice across Canada, helping affluent clients benefit from comprehensive management of their personal and family fortunes. As a true market leader in Quebec, PB1859 is continuing to expand its operations throughout Canada with its extensive range of financial solutions and strategies for the protection, growth, and transition of wealth.

Direct Brokerage
National Bank Direct Brokerage (NBDB) offers a multitude of financial products and investment tools to self-directed investors across Canada through its online investment solution. NBDB helps customers who want to manage their own investments to do so through an online trading platform or by speaking directly to a representative on the phone.

Key Success Factors

- Leader in Quebec and firmly established across Canada in full-service brokerage services with seasoned wealth management professionals. Our team of advisors makes the difference by forging lasting relationships and providing personalized solutions to clients at every life stage.
- NBI is the largest manager of managers in Canada (open architecture). Given this positioning, our clients can access the industry's best advisors.
- Leadership position in Canada in securities custody and brokerage services for independent wealth management firms.
- Strong synergies with the Personal and Commercial and Financial Markets segments, allowing a holistic service offering.

Investment Solutions
National Bank Investments Inc. (NBI) manufactures and offers mutual funds, exchange-traded funds (ETF), investment solutions, and services to consumers and institutional investors through the Bank's extended network. With its open architecture model, NBI is Canada's largest investment fund manager to entrust the management of its investments exclusively to external portfolio managers.

Administrative and Trade Execution Services
National Bank Independent Network (NBIN) is a Canadian leader in providing administrative services such as trade execution, custodial services, and brokerage solutions to many independent financial services firms across Canada, in particular to introducing brokers, portfolio managers, and investment fund managers.

Transaction Products
The Wealth Management segment provides independent advisors across Canada with a vast array of investment products, including guaranteed investment certificates (GICs), mutual funds, notes, structured products, and monetization, helping to support their own business needs and client relationships.

Trust and Estate Services
Through National Bank Trust (NBT), Wealth Management provides retail and institutional clients with turnkey services and solutions. Its team of experts offers a full range of high value-added services designed to consolidate, protect, and transfer its customers' wealth and give them peace of mind. NBT also provides integrated trustee and depository services as well as securities custody services.

Economic and Market Review

Soaring inflation resulting from the war in Ukraine has led to the fastest tightening of monetary policies since the mid-1990s. The financial market corrections were brutal, and rising interest rates caused bond and stock portfolios to post losses. A number of stock markets, including the S&P 500, entered bear market territory (market decline of over 20%). Canada's stock market also declined, although it was more resilient, primarily owing to the country's raw materials sectors, which are doing quite well in the current geopolitical context. While the market impacts of rising interest rates were felt very quicky, it will take some time to assess the full economic impacts, which could create volatility in the months to come. Although the North American economy is holding up well, the outlook for 2023 is less rosy. The real estate sector has been hit very hard—both in the U.S. and Canada—and house prices have already begun to slide despite a resilient labour market. Business leaders' confidence has been shaken by the growing risk of recession, and anemic economic growth is expected in 2023.

The economic environment in 2022 and the outlook for 2023 are discussed in more detail in the Economic Review and Outlook section on page 26.

Objectives and Strategic Priorities

The Wealth Management segment will capitalize on the strength of the Bank's brand by generating sustained earnings growth, further improving client satisfaction, and maintaining high employee engagement.

	2022 Achievements and Highlights	2023 Priorities
Create highly engaged clients thanks to an exceptional advisory-based experience	> Focused on our growth strategies by leveraging intersegment synergies and by looking beyond Quebec and also towards sectors with strong potential. > Reconciled the activities of PB1859 and Commercial Banking to better meet client needs. > Raised client satisfaction across all channels despite an uncertain economic environment.	> Further develop the quality of our advice and our closeness to clients by leveraging client relationship tools and accelerating synergies, both in terms of our expertise as well as geographically. > Continue developing a fully-integrated solution that helps advisors become independent. > Further develop a distinctive offering for clients who are in both PB1859 and the Commercial Banking sectors by adding differentiating revenue-generating components such that they can go to market together.
Have best-in-class investment and digital solutions	> Continually simplified and improved our digital ecosystem to improve client and employee experience. > Enhanced our responsible investment and non-traditional investment product offerings through teams of experts.	> Continue developing new investment solutions that are constantly aligning with client needs (responsible investing, ETFs, private investments, life goals, etc.). > Further simplify and improve digital solutions according to client needs and on a continual basis.
Target fast, expert and flawless execution	> Continued developing our analytic foundations and the 360-degree holistic view of clients. > Made ongoing investments to automate and digitalize key processes to improve both client and employee experience.	> Maintain the pace of progress on transformation projects and continue executing our automation and digitalization plan. > Continue developing analytic foundations in order to put data (360-degree holistic view) at the service of clients.
Encourage entrepreneurial culture and talent development	> Deployed multiple tools and programs to further improve diversity and inclusion and to support the ongoing development of our employees. > Created conditions that encourage employees to return to work, notably a flexible hybrid work model.	> Continue delivering an engaging employee experience by: • providing experiences tailored to employee needs and that support flexibility and quality of life; • having an inclusive culture that is conducive to synergy, agility, and a client focus.

Segment Results – Wealth Management

Year ended October 31 (millions of Canadian dollars)	2022	2021[1]	% change
Net interest income	594	446	33
Fee-based revenues	1,429	1,322	8
Transaction and other revenues	352	398	(12)
Total revenues	2,375	2,166	10
Non-interest expenses	1,391	1,293	8
Income before provisions for credit losses and income taxes	984	873	13
Provisions for credit losses	3	1	
Income before income taxes	981	872	13
Income taxes	260	231	13
Net income	721	641	12
Average assets[2]	8,226	7,146	15
Average loans and acceptances[2]	7,132	5,998	19
Net impaired loans[3]	15	16	(6)
Average deposits[2]	35,325	33,934	4
Efficiency ratio[3]	58.6 %	59.7 %	

	2022	2021[1]	% change
Assets under administration[3]	616,165	651,530	(5)
Assets under management[3]			
Individual	65,214	64,941	–
Mutual funds	47,132	52,245	(10)
	112,346	117,186	(4)

(1) For the year ended October 31, 2021, certain amounts have been reclassified, notably certain amounts that have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements (for additional information, see Note 1 to the consolidated financial statements).
(2) Represents an average of the daily balances for the period.
(3) See the Glossary section on pages 122 to 125 for details on the composition of these measures.

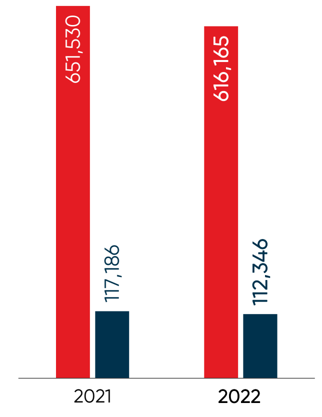
Financial Results

In the Wealth Management segment, net income totalled $721 million in fiscal 2022, up 12% from $641 million in fiscal 2021. The segment's total revenues amounted to $2,375 million in fiscal 2022, up 10% from $2,166 million in fiscal 2021. Its fiscal 2022 net interest income grew $148 million or 33% year over year owing to higher interest rates, to growth in loan and deposit volumes, and to the deposit margin. Fee-based revenues rose 8% year over year due to growth in average assets under administration and assets under management as a result of net inflows into various solutions and to stock market performance in the first half of fiscal 2022. As for transaction and other revenues, they decreased 12% year over year as a result of lower commission-generating trading volume during fiscal 2022.

For fiscal 2022, Wealth Management's non-interest expenses stood at $1,391 million compared to $1,293 million in fiscal 2021, an increase attributable to higher compensation and employee benefits, notably the variable compensation associated with revenue growth, as well as to higher operations support charges related to the segment's business growth and initiatives. At 58.6%, the segment's 2022 efficiency ratio improved by 1.1 percentage points from 59.7% in 2021.

Wealth Management recorded $3 million in provisions for credit losses in fiscal 2022 to reflect a less favourable macroeconomic environment, whereas $1 million had been recorded in fiscal 2021.

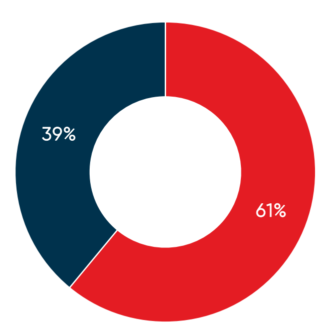
Assets Under Administration and Assets Under Management
Year ended October 31
(millions of Canadian dollars)



Financial Markets

The Financial Markets segment offers a complete suite of products and services to corporations, institutional clients, and public-sector entities. Whether providing comprehensive advisory services and research or capital markets products and services, the segment focuses on relationships with clients and their growth. Over 900 professionals serve clients through its offices in North America, Europe, the UK, and Asia.

Total Revenues by Category
Year ended October 31, 2022



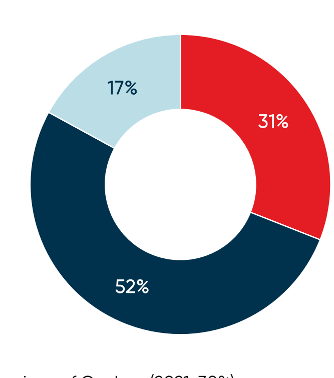
- Global Markets (2021: 53%)
- Corporate and Investment Banking (2021: 47%)

$2,468 million
Total revenues

$1,446 million
Income before provisions for credit losses and income taxes

$1,080 million
Net income

Total Revenues by Geographic Distribution
Year ended October 31, 2022



- Province of Quebec (2021: 30%)
- Other provinces (2021: 57%)
- Outside of Canada (2021: 13%)

Global Markets
Financial Markets is a Canadian leader in risk management solutions, structured products, and market-making in exchange-traded funds (ETFs) by volume. The segment offers solutions in the areas of fixed-income securities, currencies, equities, and commodities in order to mitigate the financial and business risks of clients. It also provides new product development expertise to asset managers and fund companies and supports their success by providing liquidity, research, and counterparty services. Financial Markets also provides tailored investment products across all asset classes to institutional and retail distribution channels.

Corporate and Investment Banking
Financial Markets provides corporate banking, advisory, and capital markets services. It offers loan origination and syndication to large corporations for project financing, merger and acquisition transactions, and corporate financing solutions. The segment is also an investment banking leader in Quebec and across Canada. Its comprehensive services include strategic advisory for financing and merger and acquisition initiatives as well as for debt and equity underwriting. It is the Canadian leader in government debt and corporate high-yield debt underwriting. Dominant in Quebec, the segment is the leader in debt underwriting for provincial and municipal governments across Canada while growing its national position in infrastructure and project financing. Financial Markets is active in securitization financing, mainly mortgages insured by the Government of Canada and mortgage-backed securities.

Key Success Factors

- Pan-Canadian franchise with established leadership in government debt underwriting and ETF market-making in addition to securities lending and recognized capabilities in risk management solutions, structured products, and equity derivatives.
- Client-centric business with a differentiated and diversified revenue mix.
- Sound risk management.
- Flexible approach to capital allocation and proven ability to adapt to evolving capital market conditions and to deliver consistent financial performance.
- Entrepreneurial culture: Integrated approach, teamwork, and alignment among all groups, including other segments of the Bank.

Economic and Market Review

The impacts of tighter monetary policy announced several months ago by a number of central banks are clearly being felt the world over. In Europe, rising interest rates (and soaring prices) have again stymied growth and shone a light on certain financial weaknesses, notably in the UK, where poor fiscal management nearly derailed the bond market. U.S. growth remained stronger, even though cracks have begun to appear in sectors that are more sensitive to interest rate fluctuations. The Bank of Canada followed the global trend, quickly raising its benchmark rate, which is weighing heavily on the housing market. After skyrocketing increases during the pandemic, house prices have begun to cool, putting downward pressure on household wealth at a time when consumer spending power has already been eroded by steep prices.

The economic environment in 2022 and the outlook for 2023 are discussed in more detail in the Economic Review and Outlook section on page 26.

Objectives and Strategic Priorities

	2022 Achievements and Highlights	2023 Priorities
Ensure continued growth by recruiting, coaching, and retaining a diversified workforce	> Advanced our Inclusion and Diversity strategy through scholarship and sponsorship programs. > Coached and retained our talent at all levels through mentorship and executive development programs.	> Implement innovative practices for employee recruitment, coaching, and retention while fostering inclusion.
Carry on international expansion supported by an innovative offering	> Enhanced U.S. coverage in key sectors and distribution of selected products.	> Assist our clients in their growth ambitions and funding needs.
Maintain our leadership in established businesses and leverage our strengths onto other businesses	> Ranked number one in Canadian government debt underwriting for an eighth consecutive year. > Maintained our ETF leadership position. > Ranked number one in International Securities Finance's (ISF) survey in the G2 Borrowers category for the Americas.	> Maintain our leadership through quality and innovation. > Grow market shares in corporate debt issuance.
Strengthen our leadership role in sustainable financing solutions	> Guided and advised our clients in their energy transition. > Exclusive financial advisor to Tidewater Renewables Ltd. on its $60 million renewable natural gas (RNG) and feedstock partnership with Rimrock RNG Inc., allowing each party to focus on their core competencies to build and advance RNG projects; lead lender to a wholly owned subsidiary of Tidewater Renewables Ltd. on a $26 million credit facility used to fund investment into the partnership. > Exclusive financial advisor to Whitecap Resources Inc., a leader in driving forward best ESG practices, on its $1.9 billion acquisition of XTO Energy Canada; joint bookrunner and co-lead arranger on a $1.4 billion four-year committed term loan. > Supported several cleantech companies through increased capacity.	> Continue discussions with clients, employees, and other stakeholders to achieve net-zero greenhouse gas (GHG) emissions by 2050. > Ensure depth and quality of our coverage regarding the global energy transition. > Make ESG principles a growth lever and impact multiplier for Financial Markets.

	2022 Achievements and Highlights	2023 Priorities
Further strengthen information technology to enhance and accelerate our execution	> Invested in technology and talent to deploy technology enhancements. > Leveraged and exported our technology expertise to other segments of the Bank. > Used the latest advances in deep learning to automate and scale our platform.	> Continue to create differentiated technology across all Financial Markets' business lines.
Strengthen our ability to deliver integrated advice and solutions to clients	> Exclusive financial advisor to Stantec Inc. on its acquisition of select assets of Australian-listed Cardno Limited for US$500 million. > Financial advisor to Cominar Real Estate Investment Trust on its sale to a consortium led by Canderel Management Inc. for $5.7 billion. > Sole bookrunner and lead underwriter on an $86 million bought deal equity offering for Artemis Gold Inc., following the Bank's inaugural project loan facility; co-lead arranger and underwriter of a committed credit facility of up to $385 million, plus an additional $40 million standby cost overrun facility. > Exclusive financial advisor to Nomad Royalty Company Ltd. (Nomad) on its sale to Sandstorm Gold Ltd. (Sandstorm) for US$590 million, including a fairness opinion provided to the Special Committee of Nomad; co-manager on bought deal equity offerings for Nomad ($42.5 million) and Sandstorm (US$90 million). > Exclusive financial advisor to the Credit Union Central of Saskatchewan on the sale of its 84% ownership stake in Concentra Bank to Equitable Group Inc. (Equitable); co-manager on a $230 million bought deal offering of subscription receipts for Equitable. > Exclusive financial advisor to Vegpro International Inc. on the sale of the majority of its operations to Vision Ridge Partners, LLC; sole bookrunner, administrative agent and arranger on the acquisition financing. > Exclusive financial advisor to IBI Group Inc. on its $873 million sale to Dutch-listed Arcadis N.V. > Received Consensus Economics' Forecast Accuracy Award (FAA) for Canada. > Sponsored the tenth annual Bloomberg Canadian Finance Conference.	> Deepen our relationships with corporations, institutional clients, and public-sector entities and help support their growth.

Segment Results – Financial Markets

Year ended October 31 (taxable equivalent basis)[1] (millions of Canadian dollars)	2022	2021[2]	% change
Global markets			
Equities	979	685	43
Fixed-income	367	357	3
Commodities and foreign exchange	156	128	22
	1,502	1,170	28
Corporate and investment banking	966	1,048	(8)
Total revenues[1]	2,468	2,218	11
Non-interest expenses	1,022	906	13
Income before provisions for credit losses and income taxes	1,446	1,312	10
Provisions for credit losses	(23)	(24)	4
Income before income taxes	1,469	1,336	10
Income taxes[1]	389	353	10
Net income	1,080	983	10
Average assets[3]	154,349	151,240	2
Average loans and acceptances[3] (Corporate Banking only)	22,311	19,630	14
Net impaired loans[4]	91	14	
Net impaired loans as a % of total loans and acceptances[4]	0.4 %	0.1 %	
Average deposits[3]	47,242	44,006	7
Efficiency ratio[4]	41.4 %	40.8 %	

(1) The *Total revenues* and *Income taxes* items of the Financial Markets segment are presented on a taxable equivalent basis. Taxable equivalent basis is a calculation method that consists in grossing up certain tax-exempt income by the amount of income tax that would have been otherwise payable. For the year ended October 31, 2022, *Total revenues* were grossed up by $277 million ($183 million in 2021) and an equivalent amount was recognized in *Income taxes*. The effect of these adjustments is reversed under the *Other* heading in the segment results.
(2) For the year ended October 31, 2021, certain amounts have been reclassified, in particular amounts of the loan portfolio of borrowers in the "Oil and gas" and "Pipelines" sectors as well as related activities, which were transferred from the Personal and Commercial segment to the Financial Markets segment. Moreover, certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements (for additional information, see Note 1 to the consolidated financial statements).
(3) Represents an average of the daily balances for the period.
(4) See the Glossary section on pages 122 to 125 for details on the composition of these measures.

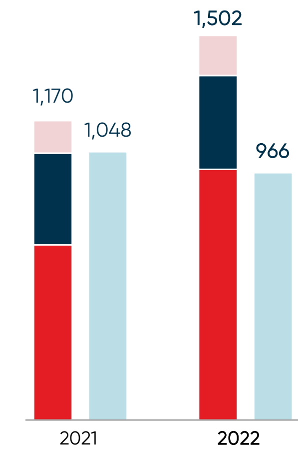
Financial Results

In the Financial Markets segment, net income totalled $1,080 million in fiscal 2022, a 10% year-over-year increase driven by growth in total revenues. The segment's income before provisions for credit losses and income taxes totalled $1,446 million in fiscal 2022, up $134 million or 10% from fiscal 2021. Its fiscal 2022 total revenues amounted to $2,468 million, up $250 million or 11% year over year. Global markets revenues rose 28% year over year owing to growth across every revenue category, notably revenues from equities as market conditions favoured greater client activity. As for the fiscal 2022 corporate and investment banking revenues, they were down 8% year over year, mainly due to a decrease in revenues related to capital markets activity, tempered by revenues generated by favourable merger and acquisition activity and by growth in loan volumes.

For fiscal 2022, the segment's non-interest expenses rose 13% year over year, essentially attributable to higher compensation and employee benefits, notably the variable compensation associated with revenue growth, and to higher technology investment expenses and operations support charges. The segment's 2022 efficiency ratio was 41.4% versus 40.8% in 2021.

Financial Markets recorded $23 million in recoveries of credit losses during fiscal 2022 compared to $24 million in recoveries of credit losses in fiscal 2021. A $78 million increase in provisions for credit losses on non-impaired loans, resulting from a less favourable macroeconomic outlook than in fiscal 2021, was offset by a $77 million decrease in provisions for credit losses on impaired loans.

Total Revenues by Category
Year ended October 31
(millions of Canadian dollars)



U.S. Specialty Finance and International

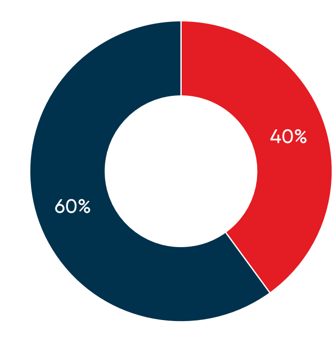
The Bank complements its Canadian growth with a targeted, disciplined international strategy that aims for superior returns. The Bank is currently focused on specialty finance in the U.S. through its Credigy subsidiary and on personal and commercial banking in Cambodia through its ABA Bank subsidiary. The Bank also holds minority positions in financial groups operating in French-speaking Africa and Africa-Asia. The Bank currently has a moratorium on any new significant investments in emerging markets. During fiscal 2022, the U.S. Specialty Finance and International (USSF&I) segment generated 12% of the Bank's consolidated total revenue and 16% of its net income.

$439 million
Total revenues

$308 million
Income before provisions for credit losses and income taxes

$216 million
Net income

Breakdown of Total Revenues
Year ended October 31, 2022



- Credigy (2021: 49%)
- ABA Bank (2021: 51%)

ABA Bank

$669 million
Total revenues

$457 million
Income before provisions for credit losses and income taxes

$340 million
Net income

U.S. Specialty Finance – Credigy

Founded in 2001 and based in Atlanta, Georgia, Credigy is a specialty finance company primarily active in financing and acquiring a diverse range of performing assets. Its portfolio is mostly comprised of diversified secured consumer receivables in the U.S. market. Through its landmark modelling expertise, flexibility, and client-centric approach, Credigy is a partner of choice for financial services institutions.

Key Success Factors

> Proven investment strategy that is adaptable to rapidly changing market conditions.

> Diversification across several classes of performing assets.

> Market credibility achieved through 350-plus transactions and over US$23 billion in total investments life-to-date.

> Rigorous underwriting approach with continuous refinement of modelling and analytics capabilities.

> Resilience to unfavourable economic conditions owing to credit quality and structural enhancements that provide downside protection.

> Emphasis on recruiting and retaining exceptional talent.

Economic and Market Review

The U.S. Federal Reserve (Fed) has already raised its policy rate by 375 basis points since March 2022, and its most recent announcements show that it believes that more work is needed to rein in inflation. Yet, the U.S. economy has begun to grow again after a difficult first six months. While the labour market remains solid, consumers are managing to cope with their reduced buying power by digging into their savings amassed during the pandemic. Americans are also maintaining their spending levels using credit. In fact, credit card debt rose 15%, year over year in the third quarter of 2022, the highest increase seen in 20 years. However, there are growing signs of an economic slowdown on the horizon. Residential investment declined for a sixth consecutive quarter—something not seen since the Great Recession of 2008-09. Moreover, the manufacturing sector growth outlook is less rosy. While inflation is showing some encouraging signs that should soon enable the Fed to press the pause button, there has been so much monetary tightening that growth is expected to slow substantially in 2023.

The economic environment in 2022 and the outlook for 2023 are discussed in more detail in the Economic Review and Outlook section on page 26.

Objectives and Strategic Priorities - Credigy

Credigy aims to provide customized solutions for the acquisition or financing of customer receivable assets in pursuit of the best risk-adjusted returns and a pre-tax return on assets (ROA) of at least 2.5%.

	2022 Achievements and Highlights	2023 Priorities
Sustain deal flow by being a partner of choice for institutions facing complex challenges and strategic changes	> Conducted active monitoring of the economy and opportunities. > Achieved a balance in transactions among new and existing partners. > Maintained average assets of approximately $8.2 billion.	> Leverage relationships with current and prospective partners. > Remain prepared to seize opportunities in rapidly evolving markets.
Maintain a diversified mix of performing assets	> Performing assets accounted for 99% of assets. > Continued asset class diversification focused on secured high-quality consumer assets. > Leveraged flexibility to invest via financing and direct acquisitions.	> Favour asset diversification and a prudent investment profile. > Maintain a stable risk-reward balance while optimizing for capital efficiency.
Achieve best risk-adjusted returns	> Refined and monitored credit models to target the best risk-return investments. > Maintained a disciplined approach to ensure a risk-return balance and a pre-tax return on assets (ROA) of at least 2.5%.	> Actively monitor macroeconomic conditions to implement risk mitigation strategies. > Deliver asset growth through a balanced mix of financing and direct acquisitions.

International – ABA Bank

Established in 1996, ABA Bank provides financial services to individuals and businesses in Cambodia. It is now the largest by assets and the fastest growing commercial bank in Cambodia. ABA Bank offers a full spectrum of financial services to micro, small and medium enterprises (MSMEs) as well as to individuals through 81 branches, 30 self-banking units, 1,024 automated teller machines (ATMs) and other self-service machines, and advanced online banking and mobile banking platforms. It has been selected as the Best Bank in Cambodia by financial magazines *The Banker*, *Global Finance* (eighth consecutive year), *Euromoney* (ninth consecutive year) and *Asiamoney.*

Key Success Factors

- Loan strategy targeting MSMEs with simple products.
- Disciplined risk management that drives high credit quality.
- Ability to fund loan growth through the deposit strategy.
- Deposit strategy based on state-of-the art technology, leading to a self-sufficient and expanding transactional banking ecosystem.
- Experienced leadership team and skilled workforce supported by robust training programs.
- Governance structure based on rigorous international standards while providing local management with the autonomy to pursue strategic priorities and business objectives.
- Leveraging National Bank's reputation as a world-class financial institution.
- International recognition of ABA Bank.

Economic and Market Review

The persistent impact of the pandemic, most notably in China, continues to affect Cambodia's tourism industry. The export sectors on the other hand are growing with textile and agriculture benefitting from the economic recovery in developed countries and the new Regional Comprehensive Trade Partnership between the Association of Southeast Asian Nations (ASEAN), Australia, New Zealand, Brunei Darussalam, China and Japan. The highly dollarized nature of the Cambodian economy (more than 80%) helps to keep inflation under control. After peaking at 8% in mid-2022, it is expected to level off at year end and return to historical averages of 3% by 2024.

The economy grew by 3% in 2021 and is expected to grow by close to 5% in 2022. In 2023, growth rates should remain close to 5%, as tourism returns to more normalized levels. Cambodia will also continue to benefit from increased regional economic integration under the ASEAN trade association. The Cambodian market is underbanked; there is a high adoption and use of mobile technology and social media in the country, and over 65% of the population of 17 million is under 35 years of age.

Objectives and Strategic Priorities – ABA Bank

ABA Bank is pursuing an omnichannel banking strategy with the goal of becoming the lending partner of choice to MSMEs while increasing market penetration in deposits and transactional services for retail and business clients.

	2022 Achievements and Highlights	2023 Priorities
Grow market share in MSME lending	> Achieved 39% growth in loan volumes. > Went from the third-largest bank in the market to the largest by increasing market share. > Continued to adapt the MSME lending strategy to support the growing needs of customers as their businesses become more mature. > Opened two new branches, bringing the total to 81 throughout the country.	> Open four branches and ten self-banking units in 2023 to extend its reach in Cambodia, continue modernizing its branch network, and gain direct access to a larger pool of MSME customers and retail deposits. > Focus on MSME clients in industries that have been minimally affected by the current economic slowdown. > Continue to adapt the lending strategy in line with the growing needs of MSME customers as their businesses become more mature.
Maintain credit quality	> Maintained a well-diversified portfolio (99% of loans are secured). > At 2.8% of the loan portfolio as at October 31, 2022, non-performing loans were below market average. > Closely monitored clients as they exited the payment deferral program established in 2020 to offer relief to clients affected by the slowdown caused by the COVID-19 pandemic. > Standard & Poor's maintained ABA Bank's long-term credit rating at B+ with a "Stable" outlook, based on its strengthening business franchise underpinned by a growing market share and above-average profitability.	> Maintain strong governance, disciplined risk management, and sound business processes. > Ensure strong credit quality across the loan portfolio to keep non-performing loan levels below market averages. > Continue to focus on secured lending.
Sustain growth in deposits and transactional services	> Grew deposit volume by 28% from fiscal 2021. > Continued to enhance self-banking capabilities, including the market-leading full-scale mobile banking application in Cambodia. > Self-banking transactions made up 98% of total transactions. > Further expanded ABA 24/7, a network of standalone self-banking locations that provide customers with round-the-clock access to their accounts and now has 30 locations throughout the country.	> Further develop the transactional banking model to accelerate the migration of cash transactions, payments, and money transfers to self-service and digital banking channels. > Adapt the product offering to support the growth and evolving needs of clients. > Increase the deposit base by providing convenience to retail customers through an advanced digital and self-banking infrastructure and by expanding the network of self-service locations.

Segment Results – USSF&I

Year ended October 31 (millions of Canadian dollars)	2022	2021	% change
Total revenues			
Credigy	439	486	(10)
ABA Bank	669	510	31
International	2	5	
	1,110	1,001	11
Non-interest expenses			
Credigy	131	139	(6)
ABA Bank	212	173	23
International	1	3	
	344	315	9
Income before provisions for credit losses and income taxes	766	686	12
Provisions for credit losses			
Credigy	35	(41)	
ABA Bank	31	26	19
	66	(15)	
Income before income taxes	700	701	–
Income taxes			
Credigy	57	86	(34)
ABA Bank	86	60	43
	143	146	(2)
Net income			
Credigy	216	302	(28)
ABA Bank	340	251	35
International	1	2	
	557	555	–
Average assets[1]	18,890	16,150	17
Average loans and receivables[1]	15,283	12,558	22
Purchased or originated credit-impaired (POCI) loans	459	464	(1)
Net impaired loans excluding POCI loans[2]	180	40	
Average deposits[1]	8,577	6,699	28
Efficiency ratio[2]	31.0 %	31.5 %	

(1) Represents an average of the daily balances for the period.
(2) See the Glossary section on pages 122 to 125 for details on the composition of these measures.

Financial Results

In the USSF&I segment, net income totalled $557 million in fiscal 2022 compared to $555 million in fiscal 2021 as total revenue growth was offset by higher provisions for credit losses. The segment's total revenues amounted to $1,110 million in fiscal 2022 versus $1,001 million in fiscal 2021, an 11% increase resulting from a $159 million or 31% increase in the ABA Bank subsidiary's revenues driven by loan and deposit growth, partly offset by a $47 million decrease in the Credigy subsidiary's revenues.

For fiscal 2022, the segment's non-interest expenses stood at $344 million compared to $315 million in fiscal 2021, a $29 million increase attributable to higher non-interest expenses at ABA Bank resulting from its business growth.

The segment's provisions for credit losses increased by $81 million compared to fiscal 2021, resulting in part from the more favourable macroeconomic outlook in fiscal 2021 as well as from more favourable remeasurements of Credigy's POCI loan portfolios in fiscal 2021.

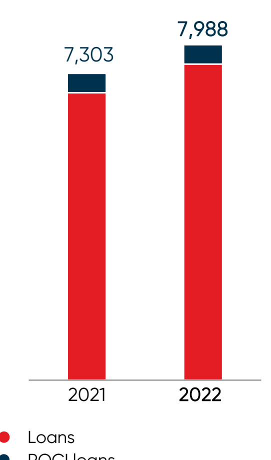
Credigy

For fiscal 2022, the Credigy subsidiary's net income totalled $216 million, a 28% year-over-year decrease that was notably due to lower revenue and a significant increase in provisions for credit losses. Its income before provisions for credit losses and income taxes totalled $308 million in fiscal 2022, down 11% year over year. Credigy's fiscal 2022 total revenues amounted to $439 million, down from $486 million in fiscal 2021. While there was growth in net interest income, it was more than offset by a decrease in non-interest income, that was due to a $26 million gain that had been realized in the first quarter of 2021 upon a disposal of loan portfolios, to a favourable impact of fair value remeasurements of certain portfolios during fiscal 2021, and to an unfavourable impact upon remeasurements of certain portfolios in fiscal 2022. Credigy's non-interest expenses were down $8 million year over year, mainly due to a decrease in variable compensation. Provisions for credit losses rose $76 million year over year, whereas in fiscal 2021, reversals of allowances for credit losses on non-impaired loans had been recorded to reflect more favourable macroeconomic conditions at that time and more favourable remeasurements of POCI loan portfolios had also been carried out.

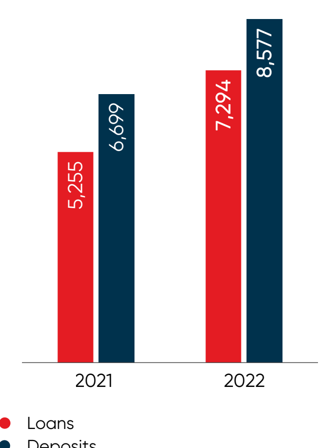
ABA Bank

For fiscal 2022, ABA Bank's net income totalled $340 million, up 35% from fiscal 2021. Growth in the subsidiary's business activities, mainly in the form of sustained loan and deposit growth, drove total revenues up 31% year over year. This increase was, however, partly offset by lower interest rates on loans given a competitive environment in Cambodia. The subsidiary's fiscal 2022 non-interest expenses stood at $212 million, a 23% year-over-year increase resulting from higher compensation and employee benefits (notably due to higher salaries given a greater number of employees and higher variable compensation associated with revenue growth) and from higher occupancy expenses attributable to business growth. ABA Bank recorded $31 million in provisions for credit losses in fiscal 2022, which is $5 million more than last year, as provisions for credit losses on impaired loans increased to reflect the end of COVID-19 relief measures that had been granted to the subsidiary's clients.

Average Loans and Receivables - Credigy
Year ended October 31
(millions of Canadian dollars)



Average Loans and Average Deposits – ABA Bank
Year ended October 31
(millions of Canadian dollars)



Other

The *Other* heading reports on Treasury operations; liquidity management; Bank funding; asset and liability management; the activities of the Flinks subsidiary, a fintech company specialized in financial data aggregation and distribution; certain specified items; and the unallocated portion of corporate units. Corporate units include Technology and Operations, Risk Management, Employee Experience, and Finance. These units provide advice and guidance throughout the Bank and to its business segments in addition to expertise and support in their respective fields.

Segment Results – Other

Year ended October 31 (millions of Canadian dollars)	2022	2021[1]
Net interest income[2]	(536)	(379)
Non-interest income[2]	201	306
Total revenues	(335)	(73)
Non-interest expenses	324	381
Income before provisions for credit losses and income taxes	(659)	(454)
Provisions for credit losses	2	–
Income before income taxes	(661)	(454)
Income taxes (recovery)[2]	(372)	(264)
Net loss	(289)	(190)
Non-controlling interests	(1)	–
Net loss attributable to the Bank's shareholders and holders of other equity instruments	(288)	(190)
Specified items after income taxes[3]	–	(7)
Net loss – Adjusted[3]	(289)	(183)
Average assets[4]	71,868	62,333

(1) For the year ended October 31, 2021, certain amounts have been reclassified.
(2) For the year ended October 31, 2022, *Net interest income* was reduced by $234 million ($181 million in 2021), *Non-interest income* was reduced by $48 million ($8 million in 2021), and an equivalent amount was recorded in *Income taxes*. These adjustments include a reversal of the taxable equivalent of the Financial Markets segment and the *Other* heading. Taxable equivalent basis is a calculation method that consists in grossing up certain tax-exempt income by the amount of income tax that would have otherwise been payable.
(3) See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP financial measures.
(4) Represents an average of the daily balances for the period.

Financial Results

For the *Other* heading of segment results, there was a net loss of $289 million in fiscal 2022 compared to a net loss of $190 million in fiscal 2021. This change in net loss was due to a decrease in total revenues arising mainly from a lower contribution from Treasury activities and from lower gains on investments in fiscal 2022. This decrease in revenues was tempered by a reduction in non-interest expenses, notably variable compensation, and in pension plan expense as well as by a $20 million reversal of the provision for the compensatory tax on salaries paid in Quebec. In fiscal 2021, the net loss had included a $33 million gain on a remeasurement of the previously held equity interest in Flinks and a $30 million loss ($26 million net of income taxes) related to the fair value measurement of the Bank's equity interest in AfrAsia.

The specified items, net of income taxes, recorded in fiscal 2021 had consisted of $7 million in intangible asset impairment losses. For fiscal 2022, net loss stood at $289 million compared to a $183 million adjusted net loss in fiscal 2021.

Quarterly Financial Information

Several trends and factors have an impact on the Bank's quarterly net income, revenues, non-interest expenses and provisions for credit losses. The following table presents a summary of results for the past eight quarters.

Quarterly Results Summary[1]

(millions of Canadian dollars)				2022[2]				2021[2]
	Q4	Q3	Q2	Q1	Q4	Q3	Q2	Q1
Statement of income data								
Net interest income	1,207	1,419	1,313	1,332	1,190	1,230	1,156	1,207
Non-interest income	1,127	994	1,126	1,134	1,021	1,024	1,082	1,017
Total revenues	2,334	2,413	2,439	2,466	2,211	2,254	2,238	2,224
Non-interest expenses	1,346	1,305	1,299	1,280	1,268	1,224	1,217	1,194
Income before provisions for credit losses and income taxes	988	1,108	1,140	1,186	943	1,030	1,021	1,030
Provisions for credit losses	87	57	3	(2)	(41)	(43)	5	81
Income taxes	163	225	248	258	215	240	228	199
Net income	738	826	889	930	769	833	788	750

(1) For additional information about the 2022 fourth-quarter results, visit the Bank's website at nbc.ca or the SEDAR website at sedar.com to consult the Bank's *Press Release for the Fourth Quarter of 2022,* published on November 30, 2022. Also, a summary of results for the past 12 quarters is provided in Table 1 on pages 112 and 113 of this MD&A.
(2) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to the consolidated financial statements.

The analysis of the past eight quarters reflects the sustained performance of all the business segments and helps readers identify the items that have favourably or unfavourably affected results. In the third and fourth quarters of fiscal 2022, the Bank's net income results decreased year over year; this was due to higher provisions for credit losses, as more favourable macroeconomic conditions in these quarters of 2021 had led to reversals of allowances for credit losses. Conversely, for the first two quarters of fiscal 2022, the net income results increased year over year. These increases came from the net income growth generated in each business segment, notably due to higher revenues, and from lower provisions for credit losses recorded in these quarters of fiscal 2022.

Net interest income posted year-over-year increases in every quarter of fiscal 2022. These increases were driven by loan and deposit growth in both the Personal and Commercial segment and the Wealth Management segment, by trading activity revenues in the Financial Markets segment (except for the fourth quarter), by loan portfolio growth and the good performance of certain Credigy portfolios, and by an increase in ABA Bank's net interest income owing to sustained business growth. In addition, interest rates were increased successively during fiscal 2022, which had a favourable impact on net interest income in the third and fourth quarters of fiscal 2022.

Non-interest income posted year-over-year increases in every quarter of fiscal 2022 except for the third quarter; the increases were driven partly by sustained business growth in the Personal and Commercial segment, particularly in the area of card revenues, where there was a notable increase in purchasing volume. In the Wealth Management segment, non-interest income grew substantially in the first and second quarters of fiscal 2022 given growth in average assets under administration and under management as a result of net inflows into various solutions and also due to stock market performance. Conversely, in the third quarter of fiscal 2022, non-interest income was down year over year, notably because higher gains on non-trading securities had been realized during the third quarter of 2021. In the fourth quarter of fiscal 2022, non-interest income was favourably affected by trading activity revenues in the Financial Markets segment. Some factors, however, had an unfavourable impact on non-interest income, including the more favourable fair value remeasurements of Credigy loan portfolios during the quarters of 2021 and a gain realized in the first quarter of 2021 upon a disposal of certain Credigy loan portfolios.

In fiscal 2022, non-interest expenses posted year-over-year increases in every quarter. These increases came from compensation and employee benefits, notably due to wage growth and a greater number of employees, as well as from investments made as part of the Bank's technological evolution. Travel and business development expenses were also up in every quarter of fiscal 2022, as activities with clients resumed during the year. However, certain expenses decreased, in particular the compensatory tax on salaries for which a downward adjustment was recorded in the first quarter of 2022 as well as the expenses incurred to implement client and employee health and safety measures in response to COVID-19, which had been higher during fiscal 2021.

For the first two quarters of fiscal 2022, provisions for credit losses decreased year over year; these decreases were due to reversals of allowances for credit losses on non-impaired loans recorded in the first half of fiscal 2022 given improvements in both the macroeconomic outlook and credit conditions, as well as to lower provisions for credit losses on impaired Commercial Banking and Financial Markets loans. Conversely, in the last two quarters of fiscal 2022, the provisions for credit losses increased year over year given less favourable macroeconomic conditions and a slight deterioration in credit conditions during the third and fourth quarters of fiscal 2022. For the third quarter of fiscal 2022, the year-over-year increase in the provisions for credit losses was also due to the favourable remeasurements of Credigy's POCI loan portfolios that had been recorded in the third quarter of 2021.

The change in the effective tax rates between the quarters of fiscal 2022 and fiscal 2021 came essentially from a higher level and proportion of tax-exempt dividend income in every quarter of fiscal 2022, except for the first quarter of fiscal 2022.

Analysis of the Consolidated Balance Sheet

Consolidated Balance Sheet Summary

As at October 31 (millions of Canadian dollars)	2022	2021[(1)]	% change
Assets			
Cash and deposits with financial institutions	31,870	33,879	(6)
Securities	109,719	106,304	3
Securities purchased under reverse repurchase agreements and securities borrowed	26,486	7,516	252
Loans and acceptances, net of allowances	206,744	182,689	13
Other	28,921	25,233	15
	403,740	355,621	14
Liabilities and equity			
Deposits	266,394	240,938	11
Other	114,101	95,233	20
Subordinated debt	1,499	768	95
Equity attributable to the Bank's shareholders and holders of other equity instruments	21,744	18,679	16
Non-controlling interests	2	3	(33)
	403,740	355,621	14

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to the consolidated financial statements.

As at October 31, 2022, the Bank had total assets of $403.7 billion, which rose $48.1 billion or 14% from $355.6 billion since the end of fiscal 2021.

Cash and Deposits With Financial Institutions

At $31.9 billion as at October 31, 2022, cash and deposits with financial institutions were down $2.0 billion since October 31, 2021, mainly due to a decrease in deposits with the Bank of Canada, partly offset by an increase in deposits with the U.S. Federal Reserve. The high level of cash and deposits with financial institutions is explained in part by the excess liquidity related to the accommodative monetary policies that have been applied by central banks since 2020. The Bank's liquidity and funding risk management practices are described on pages 91 to 100 of this MD&A.

Securities

Securities, totalling $109.7 billion as at October 31, 2022, rose $3.4 billion since October 31, 2021, due to a $2.6 billion or 3% increase in securities at fair value through profit or loss, notably securities issued or guaranteed by the Canadian government and by U.S. Treasury, other U.S. agencies, and other foreign governments, partly offset by a decrease in equity securities. Securities other than those measured at fair value through profit or loss were also up, rising $0.8 billion. Securities purchased under reverse repurchase agreements and securities borrowed rose $19.0 billion, an increase that is mainly related to the activities of the Financial Markets segment and of Treasury. The Bank's market risk management policies are described on pages 84 to 90 of this MD&A.

Loans and Acceptances

As at October 31, 2022, loans and acceptances, net of allowances for credit losses, accounted for 51% of total assets and totalled $206.7 billion, rising $24.0 billion or 13% since October 31, 2021.

Residential mortgage loans outstanding amounted to $80.1 billion as at October 31, 2022, rising $7.6 billion or 10% since October 31, 2021. This growth was mainly driven by sustained demand for mortgage credit in the Personal and Commercial segment as well as by the activities of the Financial Markets segment and the ABA Bank and Credigy subsidiaries. Personal loans totalled $45.3 billion at year-end 2022, rising $4.2 billion from $41.1 billion since October 31, 2021. This increase came mainly from business growth in Personal Banking and at ABA Bank. At $2.4 billion, credit card receivables rose $0.2 billion since October 31, 2021, as the consumer spending habits of clients gradually resumed and resulted in a notable increase in purchasing volume.

As at October 31, 2022, loans and acceptances to business and government totalled $79.9 billion, a $12.0 billion or 18% increase since October 31, 2021 that was mainly due to business growth in Commercial Banking, in the corporate financial services, and at ABA Bank.

Table 9 (page 119) shows, among other information, gross loans and acceptances by borrower category as at October 31, 2022. At $95.6 billion as at October 31, 2022, residential mortgages (including home equity lines of credit) have posted strong growth since 2018 and accounted for 46% of total loans and acceptances. The growth in residential mortgages was driven by sustained demand for mortgage credit in the Personal and Commercial segment and by the business activity at Financial Markets, ABA Bank, and Credigy. As for personal loans (including credit card receivables), they totalled $18.7 billion as at October 31, 2022, rising $2.2 billion since October 31, 2021. With respect to commercial loans, the key increases were recorded in the agriculture, utilities, manufacturing, financial services, real estate and real-estate-construction, and other services categories. As at October 31, 2022, certain categories were down compared to a year ago, notably the oil and gas category as well as the education and health care category. Furthermore, the Credigy subsidiary's POCI loans remained relatively stable since October 31, 2021.

Impaired Loans

Impaired loans include all loans classified in Stage 3 of the expected credit loss model and the Credigy subsidiary's POCI loans.

As at October 31, 2022, gross impaired loans stood at $1,271 million compared to $1,126 million as at October 31, 2021 (Table 10, page 120). As for net impaired loans, they totalled $1,030 million as at October 31, 2022 compared to $836 million as at October 31, 2021. Net impaired loans excluding POCI loans amounted to $479 million, rising $196 million from $283 million as at October 31, 2021. This increase was essentially due to the loan portfolio of the Financial Markets segment and to the loan portfolio of ABA Bank, as the COVID-19 relief measures that had been granted to this subsidiary's clients ceased. The increase was partly offset by decreases in the net impaired loans of the Commercial Banking loan portfolio and of the Credigy loan portfolio (excluding POCI loans). Net POCI loans stood at $551 million as at October 31, 2022 compared to $553 million as at October 31, 2021.

A detailed description of the Bank's credit risk management practices is provided on pages 75 to 83 of this MD&A as well as in Note 7 to the consolidated financial statements.

Other Assets

As at October 31, 2022, other assets totalled $28.9 billion versus $25.2 billion as at October 31, 2021, a $3.7 billion increase that came mainly from a $2.0 billion increase in derivative financial instruments, related to the activities of the Financial Markets segment, and from a $1.4 billion increase in receivables, prepaid expenses and other items.

Deposits

As at October 31, 2022, deposits stood at $266.4 billion, rising $25.5 billion or 11% since the end of fiscal 2021. At $78.8 billion, personal deposits, as presented in Table 12 (page 121), accounted for 30% of all deposits, and had increased $8.7 billion since October 31, 2021. This increase was driven by business growth in Personal Banking, in both the Wealth Management and Financial Markets segments, and at ABA Bank.

As shown in Table 12, business and government deposits totalled $184.2 billion as at October 31, 2022, rising $16.3 billion from $167.9 billion as at October 31, 2021. This increase came from the funding activities of the Financial Markets segment and of Treasury, including $2.0 billion in deposits subject to bank recapitalization (bail-in) conversion regulations, as well as from business and government deposits from the business activities of Commercial Banking and Wealth Management. Deposits from deposit-taking institutions totalled $3.4 billion as at October 31, 2022, rising $0.4 billion since the end of fiscal 2021.

Other Liabilities

Other liabilities stood at $114.1 billion as at October 31, 2022, rising $18.9 billion since October 31, 2021, essentially due to a $16.2 billion increase in obligations related to securities sold under repurchase agreements and securities loaned. Obligations related to securities sold short and liabilities related to transferred receivables were also up, rising $1.5 billion and $1.1 billion, respectively.

Subordinated Debt and Other Contractual Obligations

Subordinated debt increased since October 31, 2021 as a result of the issuance, on July 25, 2022, of $750 million medium-term notes, partly offset by the US$7 million redemption, on August 31, 2022, of debentures denominated in foreign currency. The contractual obligations are presented in detail in Note 29 to the consolidated financial statements.

Equity

As at October 31, 2022, equity attributable to the Bank's shareholders and holders of other equity instruments totalled $21.7 billion, rising $3.0 billion from $18.7 billion since October 31, 2021. This increase was due to net income net of dividends, to the $500 million issuance of LRCN – Series 3, to the issuances of common shares under the Stock Option Plan, to the net fair value change attributable to the credit risk on financial liabilities designated at fair value through profit or loss, and to accumulated other comprehensive income, notably net unrealized foreign currency translation gains on investments in foreign operations. These increases were partly offset by the repurchases of common shares for cancellation and by remeasurements of pension plans and other post-employment benefit plans.

The Consolidated Statements of Changes in Equity on page 136 of this *Annual Report* present the items that make up equity. In addition, an analysis of the Bank's regulatory capital is presented in the Capital Management section of this MD&A.

Exposures to Certain Activities

The Financial Stability Board (FSB) formed a working group, the Enhanced Disclosure Task Force (EDTF), that was mandated to develop principles for enhancing the risk disclosures of major banks. The EDTF published a report containing 32 recommendations. The risk disclosures required by the EDTF are provided in this *Annual Report* and in the documents entitled *Supplementary Regulatory Capital and Pillar 3 Disclosure* and *Supplementary Financial Information*, which are available on the Bank's website at nbc.ca. In addition, on page 13 of this *Annual Report* is a table of contents that readers can use to locate information relative to the 32 recommendations.

The FSB recommendations seek to enhance the transparency and measurement of certain exposures, in particular structured entities, subprime and Alt-A exposures, collateralized debt obligations, residential and commercial mortgage-backed securities, and leveraged financing structures. The Bank does not market any specific mortgage financing program to subprime or Alt-A clients. The Bank does not have any significant direct position in residential and commercial mortgage-backed securities that are not insured by the CMHC. Credit derivative positions are presented in the *Supplementary Regulatory Capital and Pillar 3 Disclosure* report, which is available on the Bank's website at nbc.ca.

Leveraged finance is commonly employed to achieve a specific objective, for example, to make an acquisition, complete a buy-out, or repurchase shares. Leveraged finance risk exposure takes the form of both funded and unfunded commitments. As at October 31, 2022, total commitments for this type of loan stood at $5,285 million ($4,048 million as at October 31, 2021). Details about other exposures are provided in the table concerning structured entities in Note 27 to the consolidated financial statements.

Related Party Transactions

In the normal course of business, the Bank provides various banking services and enters into contractual agreements and other transactions with associates, joint ventures, directors, key officers and other related parties. These agreements and transactions are entered into under conditions similar to those offered to non-related third parties.

In accordance with the *Bank Act* (Canada), the aggregate of loans granted to key officers of the Bank, excluding mortgage loans granted on their principal residence, cannot exceed twice the officer's annual salary.

Loans to eligible key officers are granted under the same conditions as those granted to any other employee of the Bank. The main conditions are as follows:

- the employee must meet the same credit requirements as a client;
- mortgage loans are offered at the preferential employee rate;
- home equity lines of credit bear interest at Canadian prime less 0.5%, but never lower than Canadian prime divided by two;
- personal loans bear interest at a risk-based regular client rate;
- credit card advances bear interest at a prescribed fixed rate in accordance with Bank policy;
- personal lines of credit bear interest at Canadian prime less 0.5%, but never lower than Canadian prime divided by two.

The Bank also offers a deferred stock unit plan to directors who are not Bank employees. For additional information, see Note 22 to the consolidated financial statements. Additional information about related parties is presented in Notes 9, 27 and 28 to the consolidated financial statements.

Income Taxes

Notice of Assessment
In September 2022, the Bank was reassessed by the Canada Revenue Agency (CRA) for additional income tax and interest of approximately $150 million (including estimated provincial tax and interest) in respect of certain Canadian dividends received by the Bank during the 2017 taxation year.

In prior fiscal years, the Bank had been reassessed for additional income tax and interest of approximately $725 million (including provincial tax and interest) in respect of certain Canadian dividends received by the Bank during the 2012-2016 taxation years.

In the reassessments, the CRA alleges that the dividends were received as part of a "dividend rental arrangement".

The CRA may issue reassessments to the Bank for taxation years subsequent to 2017 in regard to activities similar to those that were the subject of the above-mentioned reassessments. The Bank remains confident that its tax position was appropriate and intends to vigorously defend its position. As a result, no amount has been recognized in the consolidated financial statements as at October 31, 2022.

Proposed Legislation
On November 4, 2022, the Government of Canada introduced Bill C-32 – *An Act to implement certain provisions of the fall economic statement table in Parliament on November 3, 2022 and certain provisions of the budget tabled in Parliament on April 7, 2022* to implement tax measures applicable to certain entities of banking and life insurer groups, as presented in its budget of April 7, 2022. These tax measures include the Canada Recovery Dividend (CRD), which is a one-time 15% tax on the fiscal 2021 and 2020 average taxable income above $1 billion, and also include a 1.5% increase in the statutory tax rate. The amount of CRD for the Bank is estimated at $32 million. Since these tax measures were not substantively enacted at the reporting date, no amount has been recognized in the Bank's consolidated financial statements as at October 31, 2022.

Event After the Consolidated Balance Sheet

Repurchase of Common Shares
On November 29, 2022, the Bank's Board of Directors approved a normal course issuer bid, beginning December 12, 2022, to repurchase for cancellation up to 7,000,000 common shares (representing approximately 2.08% of its outstanding common shares) over the 12-month period ending December 11, 2023. Any repurchase through the Toronto Stock Exchange will be done at market prices. The common shares may also be repurchased through other means authorized by the Toronto Stock Exchange and applicable regulations, including private agreements or share repurchase programs under issuer bid exemption orders issued by the securities regulators. A private purchase made under an exemption order issued by a securities regulator will be done at a discount to the prevailing market price. The amounts that are paid above the average book value of the common shares are charged to *Retained earnings*. This normal course issuer bid is subject to the approval of OSFI and the Toronto Stock Exchange (TSX).

Securitization and Off-Balance-Sheet Arrangements

In the normal course of business, the Bank is party to various financial arrangements that, under IFRS, are not required to be recorded on the Consolidated Balance Sheet or are recorded under amounts other than their notional or contractual values. These arrangements include, among others, transactions with structured entities, derivative financial instruments, the issuance of guarantees, credit instruments, and financial assets received as collateral.

Structured Entities

The Bank uses structured entities, among other means, to diversify its funding sources and to offer services to clients, in particular to help them securitize their financial assets or provide them with investment opportunities. Under IFRS, a structured entity must be consolidated if the Bank controls the entity. Note 1 to the consolidated financial statements describes the accounting policy and criteria used for consolidating structured entities. Additional information on consolidated and non-consolidated structured entities is provided in Note 27 to the consolidated financial statements.

Securitization of the Bank's Financial Assets

Mortgage Loans

The Bank participates in two Canada Mortgage and Housing Corporation (CMHC) securitization programs: the Mortgage-Backed Securities (MBS) Program under the *National Housing Act* (Canada) (NHA) and the Canada Mortgage Bond (CMB) Program. Under the first program, the Bank issues NHA securities backed by insured residential mortgage loans and, under the second, the Bank sells NHA securities to Canada Housing Trust (CHT), which finances the purchase through the issuance of mortgage bonds insured by CMHC. Moreover, these mortgage bonds feature an interest rate swap agreement under which a CMHC-certified counterparty pays CHT the interest due to investors and receives the interest on the NHA securities. As at October 31, 2022, the outstanding amount of NHA securities issued by the Bank and sold to CHT was $24.1 billion. The mortgage loans sold consist of fixed- or variable-rate residential loans that are insured against potential losses by a loan insurer. In accordance with the NHA-MBS Program, the Bank advances the funds required to cover late payments and, if necessary, obtains reimbursement from the insurer that insured the loan. The NHA-MBS and CMB programs do not use liquidity guarantee arrangements. The Bank uses these securitization programs mainly to diversify its funding sources. In accordance with IFRS, because the Bank retains substantially all of the risks and rewards of ownership of the mortgage loans transferred to CHT, the derecognition criteria are not met. Therefore, the insured mortgage loans securitized under the CMB Program continue to be recognized in *Loans* on the Bank's Consolidated Balance Sheet, and the liabilities for the considerations received from the transfer are recognized in *Liabilities related to transferred receivables* on the Consolidated Balance Sheet. For additional information, see Note 8 to the consolidated financial statements.

Credit Card Receivables

In April 2015, the Bank set up Canadian Credit Card Trust II (CCCT II) to continue its program of securitizing credit card receivables on a revolving basis. The Bank uses this entity for capital management and funding purposes. The Bank acts as the servicer of the receivables sold and maintains the client relationship. Furthermore, it administers the securitization program and ensures that all related procedures are stringently followed and that investors are paid according to the provisions of the program.

As at October 31, 2022, the credit card receivables portfolio held by CCCT II represented an amount outstanding of $2.1 billion. CCCT II issued notes to investors, $0.1 billion of which is held by third parties and $1.3 billion is held by the Bank. CCCT II also issued a bank certificate held by the Bank that stood at $0.7 billion as at October 31, 2022. New receivables are periodically sold to the structure on a revolving basis to replace the receivables reimbursed by clients.

The different series of notes are rated by the Fitch and DBRS Morningstar (DBRS) rating agencies. From this portfolio of sold receivables, the Bank retains the excess spread, i.e., the residual net interest income after all the expenses related to this structure have been paid, and thus provides first-loss protection. Furthermore, second-loss protection for issued series is provided by notes subordinated to the senior notes, representing 5.8% of the total amount of the series issued. The Bank controls CCCT II and thus consolidates it.

Securitization of Third-Party Financial Assets

The Bank administers multi-seller conduits that purchase financial assets from clients and finance those purchases by issuing commercial paper backed by the acquired assets. Clients use these multi-seller conduits to diversify their funding sources and reduce borrowing costs while continuing to service the financial assets and providing some amount of first-loss protection. Notes issued by the conduits and held by third parties provide additional credit loss protection. The Bank acts as a financial agent and provides administrative and transaction structuring services to these conduits. The Bank provides backstop liquidity and credit enhancement facilities under the commercial paper program. These facilities are presented and described in Notes 26 and 27 to the consolidated financial statements. The Bank has concluded derivative financial instrument contracts with these conduits, the fair value of which is presented on the Bank's Consolidated Balance Sheet. The Bank is not required to consolidate these conduits, as it does not control them.

Derivative Financial Instruments

The Bank uses various types of derivative financial instruments to meet its clients' needs, generate trading activity revenues, and manage its exposure to interest rate, foreign exchange and credit risk as well as other market risks. All derivative financial instruments are accounted for at fair value on the Consolidated Balance Sheet. Transactions in derivative financial instruments are expressed as notional amounts. These amounts are not presented as assets or liabilities on the Consolidated Balance Sheet. They represent the face amount of the contract to which a rate or price is applied to determine the amount of cash flows to be exchanged. Notes 1 and 16 to the consolidated financial statements provide additional information on the types of derivative financial instruments used by the Bank and their accounting basis.

Guarantees

In the normal course of business, the Bank enters into various guarantee contracts. The principal types of guarantees are letters of guarantee, backstop liquidity and credit enhancement facilities, certain securities lending activities, and certain indemnification agreements. Note 26 to the consolidated financial statements provides detailed information on these guarantees.

Credit Instruments

In the normal course of business, the Bank enters into various off-balance-sheet credit commitments. The credit instruments used to meet the financing needs of its clients represent the maximum amount of additional credit that the Bank could be required to extend if the commitments were fully drawn. For additional information on these off-balance-sheet credit instruments and other items, see Note 26 to the consolidated financial statements.

Financial Assets Received as Collateral

In the normal course of business, the Bank receives financial assets as collateral as a result of transactions involving securities purchased under reverse repurchase agreements, securities borrowing and lending agreements, and derivative financial instrument transactions. For additional information on financial assets received as collateral, see Note 26 to the consolidated financial statements.

Capital Management

Capital management has a dual role of ensuring a competitive return to the Bank's shareholders while maintaining a solid capital foundation that covers the risks inherent to the Bank's business activities, supports its business segments, and protects its clients.

Capital Management Framework

The Bank's capital management policy defines the guiding principles as well as the roles and responsibilities of its internal capital adequacy assessment process. This process aims to determine the capital level that the Bank needs to maintain to pursue its business activities and accommodate unexpected losses arising from extremely adverse economic and operational conditions. The Bank has implemented a rigorous internal capital adequacy assessment process that comprises the following procedures:

- conducting an overall risk assessment;
- measuring significant risks and the capital requirements related to the Bank's financial budget for the next fiscal year and current and prospective risk profiles;
- integrating stress tests across the organization and executing sensitivity analyses to determine the capital buffer above minimum regulatory levels (for additional information on enterprise-wide stress testing, see the Risk Management section of this MD&A);
- aggregating capital and monitoring the reasonableness of internal capital compared with regulatory capital;
- comparing projected internal capital against regulatory capital levels, internal operating targets, and competing banks;
- attesting to the adequacy of the Bank's capital levels.

Assessing capital adequacy is an integral part of capital planning and strategy. The Bank sets internal operating targets that include a discretionary cushion in excess of the minimum regulatory requirements, which provides a solid financial structure and sufficient capital to meet management's business needs in accordance with its risk appetite, along with competitive returns to shareholders, under both normal market conditions and a range of severe but plausible stress testing scenarios. The internal capital adequacy assessment process is a key tool in establishing the Bank's capital strategy and is subject to quarterly reviews and periodic amendments.

Risk-adjusted return on capital and shareholder value added (SVA), which are obtained from an assessment of required economic capital, are calculated quarterly for each of the Bank's business segments. The results are then used to guide management in allocating capital among the various business segments.

Structure and Governance

Along with its partners from Risk Management, the Global Funding and Treasury Group, and Finance, the Capital Management team is responsible for maintaining integrated control methods and processes so that an overall assessment of capital adequacy may be performed.

The Board oversees the structure and development of the Bank's capital management policy and ensures that the Bank maintains sufficient capital in accordance with regulatory requirements and in consideration of market conditions. The Board delegates certain responsibilities to the Risk Management Committee (RMC), which in turn recommends capital management policies and oversees application thereof. The Board, on the recommendation of the RMC, assumes the following responsibilities:

- reviewing and approving the capital management policy;
- reviewing and approving the Bank's risk appetite, including the main capital and risk targets and the corresponding limits;
- reviewing and approving the capital plan and strategy on an annual basis, including the Bank's internal capital adequacy assessment process;
- reviewing and approving the implementation of significant measures respecting capital, including contingency measures;
- reviewing significant capital disclosures, including Basel capital adequacy ratios;
- ensuring the appropriateness of the regulatory capital adequacy assessment.

The Senior Leadership Team is responsible for defining the Bank's strategy and plays a key role in guiding measures and decisions regarding capital. The Enterprise-Wide Risk Management Committee oversees capital management, which consists of reviewing the capital plan and strategy and implementing significant measures respecting capital, including contingency measures, and making recommendations with respect to these measures.

Basel Accord and Regulatory Environment

Basel Accord

The Basel Accord proposes a range of approaches of varying complexity, the choice of which determines the sensitivity of capital to risks. A less complex approach, such as the Standardized Approach, uses regulatory weightings, while a more complex approach uses the Bank's internal estimates of risk components to establish risk-weighted assets and calculate regulatory capital.

As required under Basel, risk-weighted assets (RWA) are calculated for each credit risk, market risk, and operational risk. The Bank uses the Advanced Internal Ratings-Based (AIRB) Approach for credit risk to determine minimum regulatory capital requirements for a majority of its portfolios. The credit risk of certain portfolios considered to be less significant is weighted according to the Basel Standardized Approach. The simple risk-weighted method is used to calculate the charge related to banking book equity securities. This method requires proactive management of the capital allocated to portfolios with banking book equity securities, since, beyond a certain investment threshold, the cost of regulatory capital becomes prohibitive. As for operational risk, the Bank uses the Standardized Approach. Market risk-weighted assets are primarily determined using the Internal Model-Based Approach, while the Standardized Approach is used to assess interest-rate specific risk.

With respect to the risk related to securitization operations, the capital treatment depends on the type of underlying exposures and on the information available about the exposures. The Bank must use the Securitization: Internal Ratings-Based Approach (SEC-IRBA) if it is able to apply an approved internal ratings-based model and has sufficient information to calculate the capital requirements for all underlying exposures in the securitization pool. Under this approach, RWA is derived from a combination of supervisory inputs and inputs specific to the securitization exposure, such as the implicit capital charge related to the underlying exposures, the credit enhancement level, the effective maturity, the number of exposures, and the weighted average loss given default (LGD).

If the Bank cannot use the SEC-IRBA, it must use the Securitization: External Ratings-Based Approach (SEC-ERBA) for the securitization exposures that are externally rated. This approach assigns risk weights to exposures using external ratings. The Bank uses the ratings assigned by Moody's, Standard & Poor's (S&P), Fitch, Kroll Bond Rating Agency, or DBRS or a combination of these ratings. The Bank uses the Securitization: Internal Assessment Approach (SEC-IAA) for unrated securitization exposures relating to the asset-backed commercial paper conduits it sponsors. The SEC-IAA rating methodologies used are mainly based on criteria published by the above-mentioned credit rating agencies and consider risk factors that the Bank deems relevant to assessing the credit quality of the exposures. The Bank's SEC-IAA includes an assessment of the extent by which the credit enhancement available for loss protection provides coverage of expected losses. The levels of stressed coverage the Bank requires for each internal risk rating are consistent with the requirements published by the rating agencies for equivalent external ratings by asset class. If the Bank cannot apply the SEC-ERBA or the SEC-IAA, it must use the supervisory formula under the Securitization Standardized Approach (SEC-SA). Under this approach, RWA is derived from inputs specific to the securitization exposure, such as the implicit capital charge related to the underlying exposures calculated under the standardized credit risk approach as well as credit enhancement and delinquency levels.

If none of the above approaches can be used, the securitization exposure must be assigned a risk weight of 1,250%. The Bank can apply a reduced capital charge for securitization exposures that meet the criteria of the Simple, Transparent and Comparable (STC) framework.

Capital ratios are calculated by dividing capital by risk-weighted assets. Credit, market, and operational risks are factored into the risk-weighted assets calculation for regulatory purposes. Basel rules apply at the consolidated level of the Bank. Assets of non-consolidated entities for regulatory purposes are therefore excluded from the risk-weighted assets calculation.

The definition adopted by the Basel Committee on Banking Supervision (BCBS) distinguishes between three types of capital. Common Equity Tier 1 (CET1) capital consists of common shareholders' equity less goodwill, intangible assets, and other CET1 capital deductions. Additional Tier 1 (AT1) capital consists of eligible non-cumulative preferred shares, limited recourse capital notes (LRCN), and other AT1 capital adjustments. The sum of CET1 and AT1 capital forms what is known as Tier 1 capital. Tier 2 capital consists of eligible subordinated debts and certain allowances for credit losses. Total regulatory capital is the sum of Tier 1 and Tier 2 capital.

OSFI is responsible for applying the Basel Accord in Canada. As required under the Basel Accord, OSFI requires that recognized regulatory capital instruments other than common equity must have a non-viability contingent capital (NVCC) clause to ensure that investors bear losses before taxpayers should the government determine that it is in the public interest to rescue a non-viable financial institution. As at October 31, 2022, all of the Bank's regulatory capital instruments, other than common shares, have an NVCC clause. Furthermore, in the regulations of the *Canada Deposit Insurance Corporation (CDIC) Act* and the *Bank Act* (Canada), the Government of Canada has provided detailed information on conversion, issuance, and compensation regimes for bail-in instruments issued by Domestic Systemically Important Banks (D-SIBs) (collectively the Bail-In Regulations). Pursuant to the *CDIC Act,* in circumstances where OSFI has determined that the Bank has ceased, or is about to cease, to be viable, the Governor in Council may, upon a Minister of Finance recommendation indicating that he or she believes that it is in the public interest to do so, grant an order directing CDIC to convert all or a portion of certain shares and liabilities of the Bank into common shares (a "Bail-In Conversion").

The Bail-In Regulations governing the conversion and issuance of bail-in instruments came into force on September 23, 2018, and those governing compensation for holders of converted instruments came into force on March 27, 2018. Any shares and liabilities issued before the date that the Bail-In Regulations came into force are not subject to a Bail-In Conversion, unless, in the case of a liability, the terms of said liability are, on or after that day, amended to increase its principal amount or to extend its term to maturity, and the liability, as amended, meets the requirements to be subject to a Bail-In Conversion.

The Bail-In Regulations prescribe the types of shares and liabilities that are subject to a Bail-In Conversion. In general, any senior debt securities with an initial or amended term-to-maturity greater than 400 days that are unsecured or partially secured and have been assigned a Committee on Uniform Securities Identification Procedures (CUSIP), an International Securities Identification Number (ISIN), or similar identification number are subject to a Bail-In Conversion. However, certain other debt obligations of the Bank, such as structured notes (as defined in the Bail-In Regulations), covered bonds, deposits and certain derivative financial instruments, are not subject to a bail-in conversion.

The Bank and all other major Canadian banks have to maintain the following minimum capital ratios established by OSFI: a CET1 capital ratio of at least 10.5%, a Tier 1 capital ratio of at least 12.0%, and a Total capital ratio of at least 14.0%. All of these ratios are to include a capital conservation buffer of 2.5% established by the BCBS and OSFI, a 1.0% surcharge applicable solely to D-SIBs, and a 2.5% domestic stability buffer established by OSFI. The domestic stability buffer, which varies from 0% to 2.5% of risk-weighted assets, consists exclusively of CET1 capital. A D-SIB that fails to meet this buffer requirement is not subject to automatic constraints to reduce capital distributions but must provide a remediation plan to OSFI. The banks also have to meet the capital floor that sets the regulatory capital level according to the Basel II Standardized Approach. If the capital requirement under Basel III is less than 70% of the capital requirement as calculated under Basel II, the difference is added to risk-weighted assets. OSFI requires Canadian banks to meet a Basel III leverage ratio of at least 3.0%. The leverage ratio is a measure independent of risk that is calculated by dividing the amount of Tier 1 capital by total exposure. Total exposure is defined as the sum of on-balance-sheet assets (including derivative financial instruments exposures and securities financing transaction exposures) and off-balance-sheet items. The assets deducted from Tier 1 capital are also deducted from total exposure.

OSFI's *Total Loss Absorbing Capacity* (TLAC) Guideline, which applies to all D-SIBs under the federal government's bail-in regulations, is to ensure that a D-SIB has sufficient loss-absorbing capacity to support its recapitalization in the unlikely event it becomes non-viable. Available TLAC includes total capital as well as certain senior unsecured debts that satisfy all of the eligibility criteria of OSFI's TLAC guideline. Since November 1, 2021, OSFI has been requiring D-SIBs to maintain a risk-based TLAC ratio of at least 24.0% (including the domestic stability buffer) of risk-weighted assets and a TLAC leverage ratio of at least 6.75%. The TLAC ratio is calculated by dividing available TLAC by risk-weighted assets, and the TLAC leverage ratio is calculated by dividing available TLAC by total exposure. As at October 31, 2022, outstanding liabilities of $13.9 billion ($11.9 billion as at October 31, 2021) were subject to conversion under the Bail-In Regulations.

Requirements – Regulatory Capital, Leverage, and TLAC Ratios

							As at October 31, 2022
	Minimum	Capital conservation buffer	Minimum set by BCBS	D-SIB surcharge	Minimum set by OSFI[1]	Domestic stability buffer[2]	Minimum set by OSFI[1], including the domestic stability buffer
Capital ratios							
CET1	4.5 %	2.5 %	7.0 %	1.0 %	8.0 %	2.5 %	10.5 %
Tier 1	6.0 %	2.5 %	8.5 %	1.0 %	9.5 %	2.5 %	12.0 %
Total	8.0 %	2.5 %	10.5 %	1.0 %	11.5 %	2.5 %	14.0 %
Leverage ratio	3.0 %	n.a.	3.0 %	n.a.	3.0 %	n.a.	3.0 %
TLAC ratio	21.5 %	n.a.	21.5 %	n.a.	21.5 %	2.5 %	24.0 %
TLAC leverage ratio	6.75 %	n.a.	6.75 %	n.a.	6.75 %	n.a.	6.75 %

n.a. Not applicable
(1) The capital ratios and the TLAC ratio include the capital conservation buffer and the D-SIB surcharge.
(2) On June 22, 2022, OSFI confirmed that the domestic stability buffer was being maintained at 2.5%.

The Bank ensures that its capital levels are always above the minimum capital requirements set by OSFI, including the domestic stability buffer. By maintaining a strong capital structure, the Bank can cover the risks inherent to its business activities, support its business segments, and protect its clients.

Other disclosure requirements pursuant to Pillar 3 of the Basel Accord and a set of recommendations defined by the EDTF are presented in the *Supplementary Regulatory Capital and Pillar 3 Disclosure* report published quarterly and available on the Bank's website at nbc.ca. Furthermore, a complete list of capital instruments and their main features is also available on the Bank's website.

Regulatory Context

The Bank closely monitors regulatory developments and participates actively in various consultative processes. In response to the impact of the COVID-19 pandemic, on March 27, 2020 OSFI had announced a series of regulatory adjustments to support the financial and operational resilience of banks. The measures announced by OSFI that have continued to have an impact on the Bank for the year ended October 31, 2022 are described below. Also presented below are brief descriptions of ongoing regulatory projects.

COVID-19 relief measures still in effect as at October 31, 2022:

- Treatment of regulatory capital for expected credit loss accounting purposes: OSFI introduced transitional arrangements applicable to the ECL provisioning method set out in the Basel framework. Under the arrangements, a portion of allowances that would otherwise have been included in Tier 2 capital is included in CET1 capital. The increased amount is adjusted for tax effects and multiplied by a scaling factor that decreases over time. The scaling factor was set at 70% for fiscal 2020, at 50% for fiscal 2021, and at 25% for fiscal 2022. These arrangements ceased to apply on November 1, 2022.
- Capital floor: OSFI lowered the floor factor from 75% to 70%, which will stay in place until the domestic implementation of the Basel III capital floor comes into effect in the second quarter of 2023.
- Leverage ratio: OSFI is continuing to allow banks to temporarily exclude exposures from central bank reserves for leverage ratio purposes. On September 13, 2022, OSFI announced that this temporary exclusion will cease to apply on April 1, 2023.

Basel III Reform

In December 2017, the Group of Central Bank Governors and Heads of Supervision (GHOS), which oversees the BCBS, endorsed the outstanding Basel III post-crisis regulatory reforms. The purpose of the approved reforms, set out in *Basel III: Finalising Post-Crisis Reforms,* is to reduce excessive variability in risk-weighted assets and improve comparability and transparency among bank capital ratios.

On March 27, 2020, in response to the impact of the COVID-19 pandemic, GHOS announced a postponement to the implementation of the Basel III international capital standard reform. OSFI therefore postponed, until the first quarter of 2023, the implementation of the Standardized Approach and Advanced IRB Approach to credit risk, the revision of the operational risk framework and of the leverage ratio framework, and the introduction of a more risk-sensitive capital floor. Implementation of the Pillar 3 financial disclosure requirements finalized by the BCBS in December 2018 was also postponed until at least the first quarter of 2023. On November 29, 2021, OSFI postponed the implementation of the above-mentioned Basel III reform items to the second quarter of 2023. Lastly, implementation of the final set of revisions to the new market risk framework, entitled *Fundamental Review of the Trading Book* and published in January 2019, and implementation of the revised credit valuation adjustment (CVA) risk framework are being postponed to the first quarter of 2024.

On January 31, 2022, OSFI released its final capital and liquidity rules that incorporate the final Basel III reforms, and on February 7, 2022, OSFI published corresponding changes to the regulatory returns, i.e., the *Basel Capital Adequacy Return* (BCAR) and the *Leverage Requirements Return* (LRR).

Other Projects
On March 31, 2022, OSFI released, for consultation purposes, a draft guideline entitled *Assurance on Capital, Leverage and Liquidity Returns*. OSFI relies largely on the regulatory returns produced by financial institutions when assessing their safety and soundness. The purpose of this draft guideline is to better inform auditors and institutions on the work to be performed on regulatory returns in order to clarify and align OSFI's assurance expectations across all financial institutions. On November 7, 2022, OSFI released the final version of this guideline, which notably addresses the assurance that must be provided by external auditors, senior management attestation, the assurance that must be provided by internal auditors, and the effective dates, which will range from fiscal 2023 to fiscal 2025.

On June 30, 2022, the BCBS published its second public consultation on the prudential treatment of cryptoasset risk exposures faced by banks. This consultation builds on preliminary proposals from the first consultation published in June 2021 and the responses received. The BCBS plans to finalize the standards by the end of 2022. The Bank is actively participating in this consultation. On August 18, 2022, OSFI released an advisory on interim arrangements for dealing with cryptoassets held by federally regulated financial institutions, which outlines its prudential expectations on cryptoasset holdings and sets exposure limits. OSFI also provided guidance on the regulatory capital and liquidity treatment of cryptoasset exposures. These interim arrangements will take effect in the second quarter of 2023.

Capital Management in 2022

Management Activities
On November 4, 2021, OSFI amended its capital distribution expectations, namely, by permitting financial institutions to increase regular dividends and, subject to OSFI approval, to buy back shares.

On November 30, 2021, the Bank's Board of Directors approved a normal course issuer bid, which began on December 10, 2021, to repurchase for cancellation up to 7,000,000 common shares (representing approximately 2% of its common shares outstanding) over a 12-month period ending no later than December 9, 2022. This normal course issuer bid was approved by OSFI and the Toronto Stock Exchange (TSX) on December 8, 2021. During the year ended October 31, 2022, the Bank repurchased 2,500,000 common shares under this program for $245 million, which reduced *Common share* capital by $24 million and *Retained earnings* by $221 million.

On July 25, 2022, the Bank issued medium-term notes for an amount of $750 million, bearing interest at 5.426% and maturing on August 16, 2032. As these medium-term notes satisfy the NVCC requirements, they qualify for the purposes of calculating regulatory capital under Basel III.

On August 31, 2022, the Bank redeemed the US$7 million non-NVCC debentures denominated in foreign currency and maturing on February 28, 2087 at a price equal to their nominal value plus accrued interest.

On September 8, 2022, the Bank issued $500 million of LRCN – Series 3 for which noteholder recourse is limited to the assets held by an independent trustee in a consolidated limited recourse trust. The trust's assets consist of $500 million of Series 46 First Preferred Shares issued by the Bank in conjunction with the LRCN – Series 3. The LRCN – Series 3 sell for $1,000 each and bear interest at a fixed rate of 7.50% per annum until November 16, 2027 exclusively and, thereafter, at an annual rate equal to the yield on five-year Government of Canada bonds plus 4.281% until November 16, 2077. Since the LRCN – Series 3 satisfy the NVCC requirements, they qualify for the purposes of calculating regulatory capital under Basel III.

As at October 31, 2022, the Bank had 336,582,124 issued and outstanding common shares compared to 337,912,283 a year earlier. It also had 66,000,000 issued and outstanding preferred shares, unchanged from October 31, 2021. In addition, as at October 31, 2022, the Bank had 1,500,000 LRCN compared to 1,000,000 a year earlier. For additional information on capital instruments, see Notes 15 and 18 to the consolidated financial statements.

Dividends
The Bank's strategy for common share dividends is to aim for a dividend payout ratio of between 40% and 50% of net income attributable to common shareholders, taking into account such factors as financial position, cash needs, regulatory requirements, and any other factor deemed relevant by the Board.

For fiscal 2022, the Bank declared $1,206 million in dividends to common shareholders, which represents 36.8% of net income attributable to common shareholders (2021: 31.7%). The declared dividends are below the target payout range given the interruption to dividend increases prescribed by OSFI at the onset of the COVID-19 pandemic. OSFI has only been allowing Canadian banks to make capital distribution decisions, i.e., dividend increases and share buybacks, since November 4, 2021. Given the economic conditions during fiscal 2022, the Bank has taken a prudent approach to managing regulatory capital and remains confident in its ability to increase earnings going forward.

Shares, Other Equity Instruments, and Stock Options

		As at October 31, 2022
	Number of shares or LRCN	$ million
First preferred shares		
Series 30	14,000,000	350
Series 32	12,000,000	300
Series 38	16,000,000	400
Series 40	12,000,000	300
Series 42	12,000,000	300
	66,000,000	1,650
Other equity instruments		
LRCN – Series 1	500,000	500
LRCN – Series 2	500,000	500
LRCN – Series 3	500,000	500
	1,500,000	1,500
	67,500,000	3,150
Common shares	336,582,124	3,196
Stock options	11,861,749	

As at November 25, 2022, there were 336,734,809 common shares and 11,714,314 stock options outstanding. NVCC provisions require the conversion of capital instruments into a variable number of common shares should OSFI deem a bank to be non-viable or should the government publicly announce that a bank has accepted or agreed to accept an injection of capital. If an NVCC trigger event were to occur, all of the Bank's preferred shares, LRCNs, and medium-term notes maturing on February 1, 2028 and August 16, 2032, which are NVCC capital instruments, would be converted into common shares of the Bank according to an automatic conversion formula at a conversion price corresponding to the greater of the following amounts: (i) a $5.00 contractual floor price; or (ii) the market price of the Bank's common shares on the date of the trigger event (10-day weighted average price). Based on a $5.00 floor price and including an estimate for accrued dividends and interest, these NVCC capital instruments would be converted into a maximum of 1,093 million Bank common shares, which would have a 76.5% dilutive effect based on the number of Bank common shares outstanding as at October 31, 2022.

Regulatory Capital Ratios, Leverage Ratio and TLAC Ratios

As at October 31, 2022, the Bank's CET1, Tier 1, and Total capital ratios were, respectively, 12.7%, 15.4% and 16.9%, compared to ratios of, respectively, 12.4%, 15.0% and 15.9% as at October 31, 2021. All of the capital ratios have therefore increased since October 31, 2021, essentially due to net income net of dividends and to common share issuances under the Stock Option Plan. These factors were partly offset by growth in RWA, common share repurchases, and the impact of the transitional measures applicable to ECL provisioning, of which the scaling factor decreased from 50% to 25%. The increase in the Tier 1 capital ratio was also due to the $500 million issuance of limited recourse capital notes, i.e., Limited Recourse Capital Notes (LRCN) – Series 3, on September 8, 2022. The increase in the Total capital ratio was also due to the $750 million issuance of medium-term notes on July 25, 2022. As at October 31, 2022, the leverage ratio was 4.5% compared to 4.4% as at October 31, 2021. The growth in Tier 1 capital was partly offset by growth in total exposure, which will continue to benefit, until April 1, 2023, from the temporary measure permitted by OSFI with respect to the exclusion of exposures from central bank reserves.

As at October 31, 2022, the Bank's TLAC ratio and TLAC leverage ratio were, respectively, 27.7% and 8.1%, compared with 26.3% and 7.8%, respectively, as at October 31, 2021. The increase in the TLAC ratio was due to the same factors as those provided for the Total capital ratio and to the net TLAC instrument issuances during the period. The increase in the TLAC leverage ratio was due to the same factors as those provided for the leverage ratio and to the net TLAC instrument issuances.

During the year ended October 31, 2022, the Bank was in compliance with all of OSFI's regulatory capital, leverage, and TLAC requirements.

Regulatory Capital[(1)], Leverage Ratio[(1)] and TLAC[(2)]

As at October 31 (millions of Canadian dollars)	2022		2021	
	Adjusted[(3)]		Adjusted[(3)]	
Capital				
CET1	14,763	14,818	12,866	12,973
Tier 1	17,906	17,961	15,515	15,622
Total	19,727	19,727	16,643	16,643
Risk-weighted assets	116,840	116,840	104,358	104,358
Total exposure	401,780	401,780	351,160	351,160
Capital ratios				
CET1	12.6 %	12.7 %	12.3 %	12.4 %
Tier 1	15.3 %	15.4 %	14.9 %	15.0 %
Total	16.9 %	16.9 %	15.9 %	15.9 %
Leverage ratio	4.5 %	4.5 %	4.4 %	4.4 %
Available TLAC[(2)]	32,351	32,351	27,492	27,492
TLAC ratio[(2)]	27.7 %	27.7 %	26.3 %	26.3 %
TLAC leverage ratio[(2)]	8.1 %	8.1 %	7.8 %	7.8 %

(1) Capital, risk-weighted assets, total exposure, the capital ratios, and the leverage ratio are calculated in accordance with the Basel III rules, as set out in OSFI's *Capital Adequacy Requirements Guideline* and *Leverage Requirements Guideline*.
(2) Available TLAC, the TLAC ratio, and the TLAC leverage ratio are calculated in accordance with OSFI's *Total Loss Absorbing Capacity Guideline*.
(3) Adjusted amounts are calculated in accordance with the Basel III rules, as set out in OSFI's *Capital Adequacy Requirements Guideline*, and exclude the transitional measure for provisioning expected credit losses.

Movement in Regulatory Capital[1]

Year ended October 31 (millions of Canadian dollars)	2022	2021
Common Equity Tier 1 (CET1) capital		
Balance at beginning	12,973	11,167
Issuance of common shares (including Stock Option Plan)	54	93
Impact of shares purchased or sold for trading	(1)	(1)
Repurchase of common shares	(245)	–
Other contributed surplus	16	11
Dividends on preferred and common shares and distributions on other equity instruments	(1,325)	(1,089)
Net income attributable to the Bank's shareholders and holders of other equity instruments	3,384	3,140
Common share capital issued by subsidiaries and held by third parties	–	–
Removal of own credit spread net of income taxes	(733)	(20)
Other	448	496
Movements in accumulated other comprehensive income		
Translation adjustments	333	(190)
Debt securities at fair value through other comprehensive income	(105)	(30)
Other	(2)	–
Change in goodwill and intangible assets (net of related tax liability)	(67)	(73)
Other, including regulatory adjustments and transitional arrangements		
Change in defined benefit pension plan asset (net of related tax liability)	145	(402)
Change in amount exceeding 15% threshold		
Deferred tax assets	–	–
Significant investment in common shares of financial institutions	–	–
Deferred tax assets, unless they result from temporary differences (net of related tax liability)	(5)	7
Other deductions of regulatory adjustments to CET1 implemented by OSFI[2]	(52)	(136)
Change in other regulatory adjustments	–	–
Balance at end	14,818	12,973
Additional Tier 1 capital		
Balance at beginning	2,649	2,945
New Tier 1 eligible capital issuances	500	500
Redeemed capital	–	(800)
Change in non-qualifying Additional Tier 1 capital subject to phase-out	–	–
Other, including regulatory adjustments and transitional arrangements	(6)	4
Balance at end	3,143	2,649
Total Tier 1 capital	17,961	15,622
Tier 2 capital		
Balance at beginning	1,021	1,055
New Tier 2 eligible capital issuances	750	–
Redeemed capital	–	–
Change in non-qualifying Tier 2 subject to phase-out	–	–
Tier 2 instruments issued by subsidiaries and held by third parties	–	–
Change in certain allowances for credit losses	21	20
Other, including regulatory adjustments and transitional arrangements	(26)	(54)
Balance at end	1,766	1,021
Total regulatory capital	19,727	16,643

(1) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.
(2) This item includes the transitional measure applicable to expected credit loss provisioning implemented during the second quarter of 2020.

RWA by Key Risk Drivers

Risk-weighted assets (RWA) amounted to $116.8 billion as at October 31, 2022 compared to $104.4 billion as at October 31, 2021, a $12.4 billion increase resulting mainly from organic growth in RWA and from foreign exchange movements, partly offset by improvement in the credit quality of the loan portfolio and of exposures to derivative financial instruments, and by model updates and methodology and policy changes. Changes in the Bank's RWA by risk type are presented in the following table.

Risk-Weighted Assets Movement by Key Drivers[1]

Quarter ended (millions of Canadian dollars)	October 31, 2022	July 31, 2022	April 30, 2022	January 31, 2022	October 31, 2021
	Total	Total	Total	Total	Total
Credit risk – Risk-weighted assets at beginning	91,229	88,878	88,889	87,213	85,914
Book size	2,405	2,500	1,780	1,002	1,944
Book quality	93	(59)	(1,397)	(22)	(430)
Model updates	300	13	(666)	29	(7)
Methodology and policy	339	–	–	–	–
Acquisitions and disposals	–	–	–	–	–
Foreign exchange movements	1,775	(103)	272	667	(208)
Credit risk – Risk-weighted assets at end	96,141	91,229	88,878	88,889	87,213
Market risk – Risk-weighted assets at beginning	5,696	4,453	3,498	3,770	4,072
Movement in risk levels[2]	329	1,243	542	(272)	(302)
Model updates	–	–	413	–	–
Methodology and policy	–	–	–	–	–
Acquisitions and disposals	–	–	–	–	–
Market risk – Risk-weighted assets at end	6,025	5,696	4,453	3,498	3,770
Operational risk – Risk-weighted assets at beginning	14,452	14,147	13,781	13,375	13,153
Movement in risk levels	222	305	366	406	222
Acquisitions and disposals	–	–	–	–	–
Operational risk – Risk-weighted assets at end	14,674	14,452	14,147	13,781	13,375
Risk-weighted assets at end	116,840	111,377	107,478	106,168	104,358

(1) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.
(2) Also includes foreign exchange rate movements that are not considered material.

The table above provides the risk-weighted assets movements by key drivers underlying the different risk categories.

The *Book size* item reflects organic changes in book size and composition (including new loans and maturing loans). RWA movements attributable to book size include increases or decreases in exposures, measured by exposure at default, assuming a stable risk profile.

The *Book quality* item is the Bank's best estimate of changes in book quality related to experience, such as underlying customer behaviour or demographics, including changes resulting from model recalibrations or realignments and also including risk mitigation factors.

The *Model updates* item is used to reflect implementations of new models, changes in model scope, and any other change applied to address model malfunctions. During the year ended October 31, 2022, the Bank updated the models used for retail lines of credit, mortgages, home equity lines of credit, and certain non-retail exposures. It also changed the SVaR period of the 2008 Global Financial Crisis (GFC) to the 2020 COVID-19 period at the start of the second quarter of 2022 and then returned to the 2008 GFC period towards the end of the same quarter. Lastly, the Bank transitioned a retail loan portfolio from the Standardized Approach to the Advanced Internal Ratings-Based (AIRB) Approach for measuring credit risk.

The *Methodology and policy* item presents the impact of changes in calculation methods resulting from changes in regulatory policies or from new regulations. During the year ended October 31, 2022, the Bank decided to early adopt the Basel III reform requirements related to risk parameter floors for certain exposures calculated using the Internal Ratings-Based Approach for credit risk.

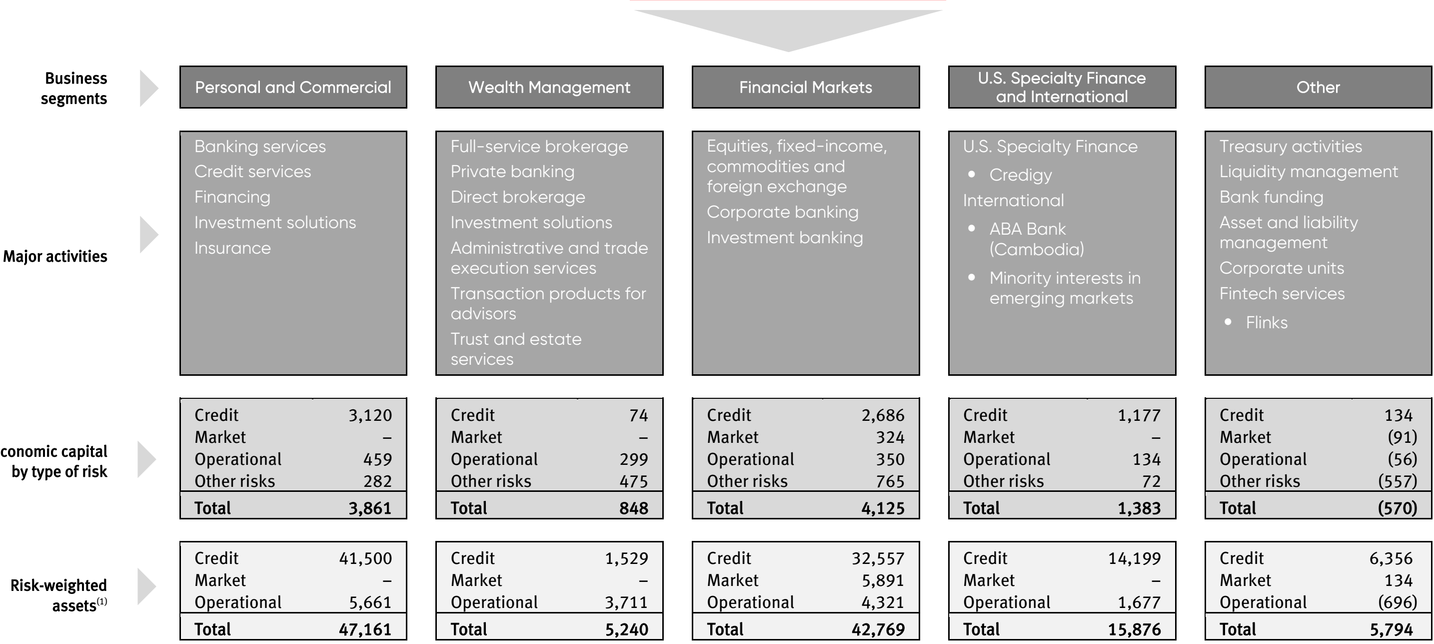
Allocation of Economic Capital and Regulatory RWA

Economic capital is an internal measure that the Bank uses to determine the capital it needs to remain solvent and to pursue its business operations. Economic capital takes into consideration the credit, market, operational, business, and other risks to which the Bank is exposed as well as the risk diversification effect among them and among the business segments. Economic capital thus helps the Bank to determine the capital required to protect itself against such risks and ensure its long-term viability. The by-segment allocation of economic capital and regulatory RWA was carried out on a stand-alone basis before attribution of goodwill and intangible assets. The method used to assess economic capital is reviewed regularly in order to accurately quantify these risks.

The Risk Management section of this MD&A provides comprehensive information about the main types of risk. The "Other risks" presented below include risks such as business risk and structural interest rate risk in addition to the benefit of diversification among types of risk.

Allocation of Risks by Business Segment

As at October 31, 2022
(millions of Canadian dollars)



Economic capital by type of risk	Personal and Commercial	Wealth Management	Financial Markets	U.S. Specialty Finance and International	Other
Credit	3,120	74	2,686	1,177	134
Market	–	–	324	–	(91)
Operational	459	299	350	134	(56)
Other risks	282	475	765	72	(557)
Total	**3,861**	**848**	**4,125**	**1,383**	**(570)**

Risk-weighted assets[1]	Personal and Commercial	Wealth Management	Financial Markets	U.S. Specialty Finance and International	Other
Credit	41,500	1,529	32,557	14,199	6,356
Market	–	–	5,891	–	134
Operational	5,661	3,711	4,321	1,677	(696)
Total	**47,161**	**5,240**	**42,769**	**15,876**	**5,794**

(1) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.

Risk Management

In this section of the MD&A, grey-shaded text and tables marked with an asterisk (*) are integral parts of the consolidated financial statements. They represent the Bank's objectives, its risk management policies and procedures, and the methods it applies to measure credit risk, market risk as well as liquidity and funding risk, as required by IFRS 7 – *Financial Instruments: Disclosures.*

Risk-taking is intrinsic to a financial institution's business. The Bank views risk as an integral part of its development and the diversification of its activities. It advocates a risk management approach that is consistent with its business strategy. The Bank voluntarily exposes itself to certain risk categories, particularly credit and market risk, in order to generate revenue. It also assumes certain risks that are inherent to its activities—to which it does not choose to expose itself—and that do not generate revenue, i.e., mainly operational risks. The purpose of sound and effective risk management is to provide reasonable assurance that incurred risks do not exceed acceptable thresholds, to control the volatility in the Bank's results, and to ensure that risk-taking contributes to the creation of shareholder value.

Risk Management Framework

Risk is rigorously managed. Risks are identified, measured, and controlled to achieve an appropriate balance between returns obtained and risks assumed. Decision-making is therefore guided by risk assessments that align with the Bank's risk appetite and by prudent levels of capital and liquidity. Despite the exercise of stringent risk management and existing mitigation measures, risk cannot be eliminated entirely, and residual risks may occasionally cause significant losses.

The Bank has developed guidelines that support sound and effective risk management and that help preserve its reputation, brand, and long-term viability.

- risk is everyone's business: the business units, the risk management and oversight functions, and Internal Audit all play an important role in ensuring a risk management framework is in place; operational transformations and simplifications are conducted without compromising rigorous risk management;
- client-centric: having quality information is key to understanding clients, effectively managing risk, and delivering excellent client service;
- enterprise-wide: an integrated view of risk is the basis for sound and effective risk management and decision-making by management;
- human capital: the Bank's employees are engaged, experienced and have a high level of expertise; their curiosity supports continuous development and their rigour ensures that risk management is built into the corporate culture; incentive-based compensation programs are designed to adhere to the Bank's risk tolerance;
- fact-based: good risk management relies heavily on common sense and good judgment and on advanced systems and models.

Risk Appetite

Risk appetite represents how much risk an organization is willing to assume to achieve its business strategy. The Bank defines its risk appetite by setting tolerance thresholds, by aligning those thresholds with its business strategy, and by integrating risk management throughout its corporate culture. Risk appetite is built into decision-making processes as well as into strategic, financial, and capital planning.

The Bank's risk appetite framework consists of principles, statements, metrics as well as targets and is reinforced by policies and limits. When setting its risk appetite targets, the Bank considers regulatory constraints and the expectations of stakeholders, in particular customers, employees, the community, shareholders, regulatory agencies, governments, and rating agencies. The risk appetite framework is defined by the following principles and statements:

The Bank's reputation, brand and long-term viability are at the centre of our decisions, which demand:

- a strong credit rating to be maintained;
- a strong capital and cash position;
- rigorous management of regulatory compliance risk, including sales practices;
- zero tolerance for negligence in information security.

The Bank understands the risks taken; they are aligned with our business strategy and translate into:

- a risk-reward balance;
- a stable risk profile;
- a strategic level of concentration aligned with approved targets.

The Bank's transformation and simplification plan is being carried out without compromising rigorous risk management, which is reflected in:

- a low tolerance to operational and reputation risk;
- operational and information systems stability, both under normal circumstances and in times of crisis.

The Bank's management and business units are involved in the risk appetite setting process and are responsible for adequately monitoring the chosen risk indicators. These needs are assessed by means of the enterprise strategic planning process. The risk indicators are reported on a regular basis to ensure an effective alignment between the Bank's risk profile and its risk appetite, failing which appropriate actions might be taken. Additional information on the key credit, market and liquidity risk indicators monitored by the Bank's management is presented on the following pages.

Enterprise-Wide Stress Testing

An enterprise-wide stress testing program is in place at the Bank. It is part of a more extensive process aimed at ensuring that the Bank maintains adequate capital levels commensurate with its business strategy and risk appetite. Stress testing can be defined as a risk management method that assesses the potential effects—on the Bank's financial position, capital and liquidity—of a series of specified changes in risk factors, corresponding to exceptional but plausible events. The program supports management's decision-making process by identifying potential vulnerabilities for the Bank as a whole and that are considered in setting limits as well as in longer term business planning. The scenarios and stress test results are approved by the Stress Testing Oversight Committee and are reviewed by the Global Risk Committee (GRC) and the Risk Management Committee (RMC). For additional information, see the Stress Testing section of this MD&A applicable to credit risk, market risk, and liquidity risk.

Incorporation of Risk Management Into the Corporate Culture

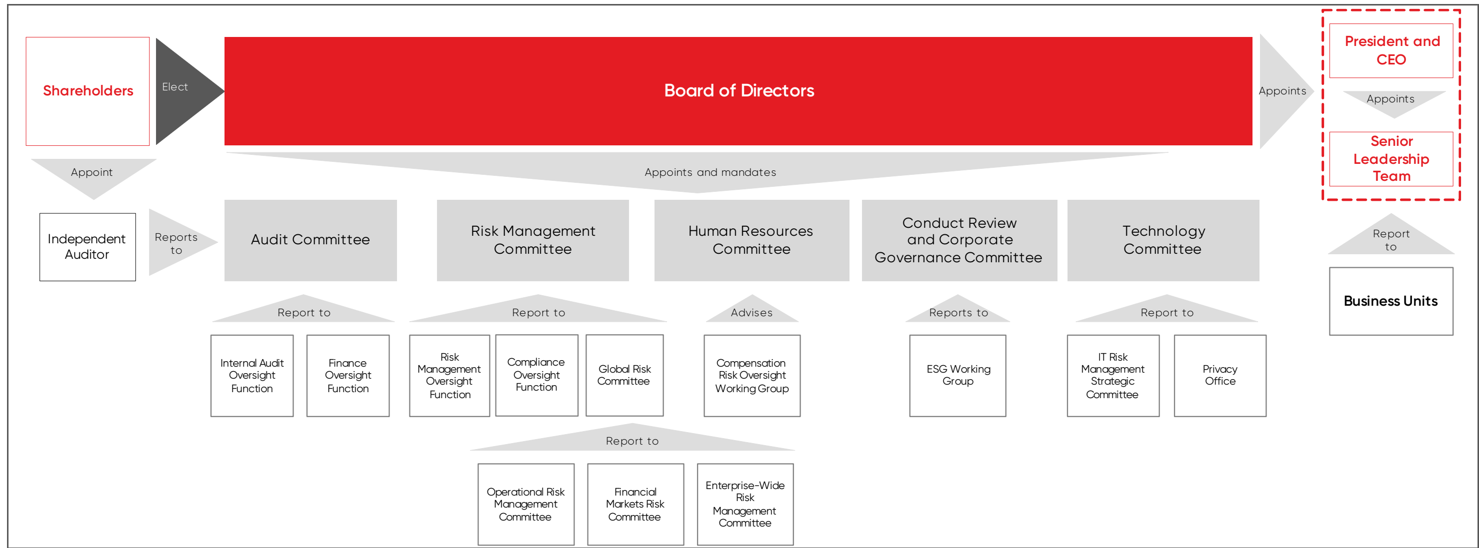
Risk management is supported by the Bank's cultural evolution through, notably, the following pillars:

- Tone set by management: The Bank's management continually promotes risk management through internal communications. The Bank's risk appetite is therefore known to all.
- Shared accountability: A balanced approach is advocated, whereby business development initiatives are combined with a constant focus on sound and effective risk management. In particular, risk is taken into consideration when preparing the business plans of the business segments, when analyzing strategic initiatives, and when launching new products.
- Transparency: A foundation of the business's values, transparency lets us communicate our concerns quickly without fear of reprisal. We are a learning-focused organization where employees are allowed to make mistakes.
- Behaviour: The Bank's risk management is strengthened by incentive compensation programs that are structured to reflect the Bank's risk appetite.
- Continuous development: All employees must complete mandatory annual regulatory compliance training focused on the Bank's *Code of Conduct* and on anti-money laundering and anti-terrorist financing (AML/ATF) efforts as well as cybersecurity training. Risk management training is also offered across all of the Bank's business units.

In addition to these five pillars, Internal Audit carries out an evaluation of the corporate culture as part of its mandate. Furthermore, to ensure the effectiveness of the existing risk management framework, the Bank has defined clear roles and responsibilities by reinforcing the concept of the three lines of defence. The Governance Structure section presented on the following pages defines this concept as well as the roles and responsibilities of the three lines of defence.

First Line of Defence Risk Owner	**Second Line of Defence** Independent Oversight	**Third Line of Defence** Independent Assurance
Business Units	Risk Management and Oversight Functions	Internal Audit
• Identify, manage, assess and mitigate risks in day-to-day activities. • Ensure activities are in alignment with the Bank's risk appetite and risk management policies.	• Oversee risk management by setting policies and standards. • Provide independent oversight of management practices and an independent challenge of the first line of defence. • Promote sound and effective risk management at the Bank. • Monitor and report on risk.	• Provide the Board and management with independent assurance as to the effectiveness of the main governance, risk management, and internal control processes and systems. • Provide recommendations and advice to promote the Bank's long-term financial strength.

Governance Structure *
The following chart shows the Bank's overall governance architecture and the governance relationships established for risk management.



The Board of Directors (Board)[(1)]
The Board is responsible for approving and overseeing management of the Bank's internal and commercial affairs, and it establishes strategic directions together with management. It also approves and oversees the Bank's overall risk philosophy and risk appetite, acknowledges and understands the main risks faced by the Bank, and makes sure appropriate systems are in place to effectively manage and control those risks. In addition, the Board ensures that the Bank operates in accordance with environmental, social and governance (ESG) practices and strategies. It carries out its mandate both directly and through its committees: the Audit Committee, the Risk Management Committee, the Human Resources Committee, the Conduct Review and Corporate Governance Committee, and the Technology Committee. In addition, the various oversight functions, the Global Risk Committee and the working groups report to the Board and advise it.

The Audit Committee[(1)]
The Audit Committee oversees the work of the Bank's internal auditor and independent auditor; ensures the Bank's financial strength; establishes the Bank's financial reporting framework, analysis processes and internal controls; and reviews any reports of irregularities in accounting, internal controls, or audit.

The Risk Management Committee (RMC)[(1)]
The Risk Management Committee examines the risk appetite framework and recommends it to the Board for approval. It approves the main risk management policies and risk tolerance limits. It ensures that appropriate resources, processes, and procedures are in place to properly and effectively manage risk on an ongoing basis. Finally, it monitors the risk profile and risk trends of the Bank's activities and ensures alignment with the risk appetite.

The Human Resources Committee[(1)]
The Human Resources Committee examines and approves the Bank's total compensation policies and programs, taking into consideration the risk management framework and ESG strategies, and recommends their approval to the Board. It recommends, for Board approval, the compensation of the President and Chief Executive Officer, of the members of the Senior Leadership Team, and of the heads of the oversight functions. This committee oversees all human resources practices, including employee health and well-being, talent management matters such as succession planning for management and oversight functions, as well as inclusion and diversity.

The Conduct Review and Corporate Governance Committee[(1)]
The Conduct Review and Corporate Governance Committee ensures that the Bank maintains sound practices that comply with legislation and best practices, particularly in the area of ESG responsibilities, and that they align with the Bank's One Mission. It periodically reviews and approves professional conduct and ethical behaviour standards, including the *Code of Conduct.* The committee oversees the application of complaint review mechanisms and implements mechanisms that ensure compliance with consumer protection provisions, including the *Whistleblower Protection Policy*, and that prevent prohibited financial transactions between the Bank and related parties. Lastly, it ensures that the directors are qualified by evaluating the performance and effectiveness of the Board and its members and by planning director succession and the composition of the Board.

The Technology Committee[(1)]
The Technology Committee oversees the various components of the Bank's technology program. It reviews, among other things, the Bank's technology strategy and monitors technology risks, including cyberrisks, cybercrime, and protection of personal information. The IT Risk Management Strategic Committee and the Privacy Office report to the Technology Committee.

(1) Additional information about the Bank's governance architecture can be found in the *Management Proxy Circular for the 2023 Annual Meeting of Holders of Common Shares*, which will soon be available on the Bank's website at nbc.ca and on SEDAR's website at sedar.com. The mandates of the Board and of its committees are available in their entirety at nbc.ca.

Senior Leadership Team of the Bank

Composed of the President and Chief Executive Officer and the officers responsible for the Bank's main functions and business units, the Bank's Senior Leadership Team ensures that risk management is sound and effective and aligned with the Bank's pursuit of its objectives and strategies. The Senior Leadership Team promotes the integration of risk management into its corporate culture and manages the primary risks facing the Bank.

The Internal Audit Oversight Function

The Internal Audit Oversight Function is the third line of defence in the risk management framework. It is responsible for providing the Bank's Board and management with objective, independent assurance on the effectiveness of the main governance, risk management, and internal control processes and systems and for making recommendations and providing advice to promote the Bank's long-term strength.

The Finance Oversight Function

The Finance Oversight Function is responsible for optimizing management of financial resources and ensuring sound governance of financial information. It helps the business segments and support functions with their financial performance, ensures compliance with regulatory requirements, and carries out the Bank's reporting to shareholders and the external reporting of the various units, entities, and subsidiaries of the Bank. It is responsible for capital management and actively participates in the activities of the Asset/Liability Management Committee.

The Risk Management Oversight Function

The Risk Management service is responsible for identifying, assessing and monitoring—independently and using an integrated approach—the various risks to which the Bank and its subsidiaries are exposed and for promoting a risk management culture throughout the Bank. The Risk Management team helps the Board and management understand and monitor the main risks. This service also develops, maintains, and communicates the risk appetite framework while overseeing the integrity and reliability of risk measures.

The Compliance Oversight Function

The Compliance Oversight Function is responsible for implementing a Bank-wide regulatory compliance risk management framework by relying on an organizational structure that includes functional links to the main business segments. It also exercises independent oversight and conducts assessments of the compliance of the Bank and its subsidiaries with regulatory compliance risk standards and policies.

The Global Risk Committee (GRC)

The Global Risk Committee is the overriding governing entity of all the Bank's risk committees, and it oversees every aspect of the overall management of the Bank's risk. It sets the parameters of the policies that determine risk tolerance and the overall risk strategy, for the Bank and its subsidiaries as a whole, and sets limits as well as tolerance and intervention thresholds enabling the Bank to properly manage the main risks to which it is exposed. The committee approves and monitors all large credit facilities. It reports to the Board, and recommends for Board approval, the Bank's risk philosophy, risk appetite, and risk profile management. The Operational Risk Management Committee, the Financial Markets Risk Committee, and the Enterprise-Wide Risk Management Committee presented in the governance structure chart are the primary committees reporting to the Global Risk Committee. The Global Risk Committee also carries out its mandate through the Senior Complex Valuation Committee, the Models Oversight Committee, and the Product and Activity Review Committees.

The Compensation Risk Oversight Working Group

The working group that monitors compensation-related risks supports the Human Resources Committee in its compensation risk oversight role. It is made up of at least three members, namely, the Executive Vice-President, Risk Management; the Chief Financial Officer and Executive Vice-President, Finance; and the Executive Vice-President, Employee Experience. The working group helps to ensure that compensation policies and programs do not unduly encourage senior management members, officers, material risk takers, or bank employees to take risks beyond the Bank's risk tolerance thresholds. As part of that role, it ensures that the Bank is adhering to the Corporate Governance Guidelines issued by OSFI and to the Principles for Sound Compensation Practices issued by the Financial Stability Board, for which the Canadian implementation and monitoring is conducted by OSFI. The RMC also reviews the reports presented by this working group.

The ESG Working Group

Under the leadership of the Chief Financial Officer and Executive Vice-President, Finance, and made up of several officers from different areas of the Bank, the ESG Working Group's main role is to develop and support the Bank's environmental, social and governance initiatives and strategies. Its members meet on a monthly basis. The ESG Working Group is responsible for implementing the recommendations made by the Task Force on Climate-related Financial Disclosures (TCFD) and by the UN Principles for Responsible Banking as well as for implementing the Bank's climate commitments. At least twice a year, the ESG Working Group reports to the Conduct Review and Governance Committee on the progress made and on ongoing and upcoming ESG projects. In addition, and in a timely fashion, the ESG Working Group makes presentations on topics of particular interest, such as the TCFD report, to the Audit Committee and the RMC.

The IT Risk Management Strategic Committee (ITRMSC)

The Bank's management has entrusted the ITRMSC with responsibility for the governance of technology-related risk and cyberrisk. Under the leadership of the Executive Vice-President, Risk Management and the Executive Vice-President, Technology and Operations, this committee approves the technology and cyberrisk management policy as well as other policies related to technology risk management. Among other responsibilities, it reviews the technology risk and cyberrisk posture as well as any matter requiring an alignment between the technology strategy and the associated risks.

The Privacy Office

The Privacy Office develops and implements the personal information privacy program and the Bank's strategy for ensuring privacy and protecting personal information. It oversees the development, updating, and application of appropriate documentation in support of the Bank's personal information privacy program, including policies, standards, and procedures. It also oversees the risk governance framework and the implementation of appropriate controls designed to mitigate privacy risk. Lastly, it supports the business units in their execution of the Bank's strategic directions and ensures adherence to privacy best practices.

The Business Units

As the first line of defence, the business units manage risks related to their operations within established limits and in accordance with risk management policies by identifying, analyzing, managing, and understanding the risks to which they are exposed and implementing risk mitigation mechanisms. The management of these units must ensure that employees are adhering to current policies and limits.

Risk Management Policies

The risk management policies and related standards and procedures set out responsibilities, define and describe the main business-related risks, specify the requirements that business units must fulfill when assessing and managing these risks, stipulate the authorization process for risk-taking, and set the risk limits to be adhered to. They also establish the accountability reporting that must be provided to the various risk-related bodies, including the RMC. The policies cover the Bank's main risks, are reviewed regularly to ensure they are still relevant given market changes, regulatory changes and changes in the business plans of the Bank's business units, and they apply to the entire Bank and its subsidiaries, when applicable. Other policies, standards, and procedures complement the main policies and cover more specific aspects of risk management such as business continuity; the launch of new products, initiatives, or activities; or financial instrument measurement.

Governance of Model Risk Management

The Bank uses several models to guide enterprise-wide risk management, financial markets strategy, economic and regulatory capital allocation, global credit risk management, wealth management, and profitability measures. The model risk management policies as well as a rigorous model management process ensure that model usage is appropriate and effective.

The key components of the Bank's model risk management governance framework are as follows: the model risk management policies and standards, the model validation group, and the Models Oversight Committee. The policies and standards set the rules and principles applicable to the development and independent validation of models. The scope of models covered is wide, ranging from market risk pricing models and automated credit decision-making models to the business risk capital models, including models used for regulatory capital and stressed capital purposes, expected credit losses models, and financial-crime models. The framework also includes more advanced artificial intelligence models.

One of the cornerstones of the Bank's policies is the general principle that all models deemed important for the Bank or used for regulatory capital purposes require heightened lifecycle monitoring and independent validation. All models used by the Bank are therefore classified in terms of risk level (low, medium, or high). Based on this classification, the Bank applies strict guidelines regarding the requirements for model development and documentation, independent review thereof, performance monitoring thereof, and minimum review frequency. The Bank believes that the best defence against "model risk" is the implementation of a robust development and validation framework.

Independent Oversight by the Compliance Service

Compliance is an independent oversight function within the Bank. Its Senior Vice-President, Chief Compliance Officer and Chief Anti-Money Laundering Officer has direct access to the RMC and to the President and Chief Executive Officer and can communicate directly with officers and directors of the Bank and of its subsidiaries and foreign centres. The Senior Vice-President, Chief Compliance Officer and Chief Anti-Money Laundering Officer regularly meets with the Chair of the RMC, in the absence of management, to review matters on the relationship between the Compliance Service and the Bank's management and on access to the information required.

Business unit managers must oversee the implementation of mechanisms for the daily control of regulatory compliance risks arising from the operations under their responsibility. Compliance exercises independent oversight in order to assist managers in effectively managing these risks and to obtain reasonable assurance that the Bank is compliant with the regulatory requirements in effect where it does business, both in Canada and internationally.

Independent Assessment by Internal Audit

Internal Audit is an independent oversight function created by the Audit Committee. Its Senior Vice-President has direct access to the Chair of the Audit Committee and to the Bank's President and Chief Executive Officer and can communicate directly with officers and directors of the Bank and of its subsidiaries and foreign centres. The Senior Vice-President, Internal Audit, regularly meets with the Chair of the Audit Committee, in the absence of management, to review matters on the relationship between Internal Audit and the Bank's management.

Internal Audit provides reasonable assurance that the main governance, risk management, and internal control processes and systems are ensuring that, in all material respects, the Bank's key control procedures are effective and compliant. Internal Audit also provides recommendations and advice on how to strengthen these key control procedures. Business unit managers and senior management must ensure the effectiveness of the main governance, risk management, and internal control processes and systems, and they must implement corrective measures if needed.

Top and Emerging Risks

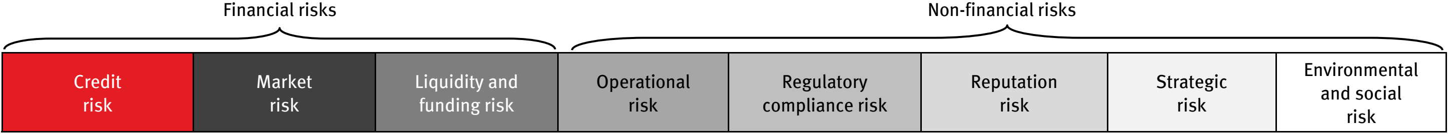
Managing risk requires a solid understanding of every type of risk found across the Bank, as they could have a material adverse effect on the Bank's business, results of operations, financial position, and reputation. As part of its approach to risk management, the Bank identifies, assesses, reviews and monitors the range of top and emerging risks to which it is exposed in order to proactively manage them and implement appropriate mitigation strategies. Identified top and emerging risks are presented to senior management and communicated to the RMC.

The Bank applies a risk taxonomy that categorizes, into two groups, the top risks to which the Bank is exposed in the normal course of business:

- Financial risks: Directly tied to the Bank's key business activities and are generally more quantifiable or predictable;
- Non-financial risks: Inherent to the Bank's activities and to which it does not choose to expose itself.

The Bank separately qualifies the risks to which it is exposed: a "top risk" is a risk that has been identified, is clearly defined, and could have a significant impact on the Bank's business, results of operations, financial position, and reputation, whereas an "emerging risk" is a risk that, while it may also have an impact on the Bank, is not yet well understood in terms of its likelihood, consequences, timing, or the magnitude of its potential impact.

In the normal course of business, the Bank is exposed to the following top risks.



The Bank is also exposed to other new, so-called emerging or significant risks, which are defined as follows.

Risk and Trend	Description
Geopolitical risk	Government decisions and international relations can have a significant impact on the environment in which the Bank operates. Geopolitical events can lead to volatility, have a negative impact on at-risk assets, and cause financial conditions to deteriorate. They could also directly or indirectly affect banking activities by having repercussions on clients. The war in Ukraine, which has disrupted energy and agricultural supply chains, is a good example. The economic sanctions taken against Russia for its invasion of Ukraine and the steps taken by Russia to significantly reduce natural gas supply to Europe have led to soaring energy costs. This situation has triggered the negative economic headwinds now facing Europe and heightened the risk of a political reaction in the form of new governments taking power and social unrest. Even if the war was expected to end relatively quickly, the shattered trust suggests that Europe and Russia will continue to take measures to become less dependant on one another, notably regarding energy matters. While new risks could arise at any time, certain concerns are compelling us to monitor other situations at this time. The geopolitical power struggle that for years has pitted the U.S. against China is one such concern. Businesses, in particular those operating in sectors deemed strategic, run an increasing risk of finding themselves in a maze of contradictory regulations, where complying with U.S. regulations means violating Chinese law, and vice versa. These tensions could also partially undo some of the ties forged between these two superpowers in the financial markets, and Canada might get caught in the crosshairs of the two countries. A recent escalation in tensions between China and the United States on the subject of Taiwan is a new source of disagreement between the two superpowers. While we do not believe an invasion is imminent, China will continue to exert pressure on Taiwan through a combination of unprecedented military exercises and economic sanctions. Taiwan's importance is highlighted by the fact that it is by far the leading global producer of advanced microchips (over 90% of the market share). But the potential for confrontation is not limited to the China-U.S. relationship, as protectionism is gaining popularity, and a growing number of countries are implementing measures to both financially support domestic businesses in key sectors (high tech, health care, and food) and to protect them against global competition through business restrictions. The combined effects of supply shortages and geopolitical tensions have shifted the focus from efficiency to supply security. We will continue to monitor all of these developments, analyze any new risks that arise, and assess the impacts that they may have on our organization.
Economic risk	Although the economy recovered quickly during the pandemic, a number of risks still remain and others are emerging. Most countries are now dealing with variants, but we are not immune to the emergence of new, more infectious strains that could once again destabilize the economy. For its part, China is going it alone with its zero-COVID policy. Given China's importance to the global economy and supply chain, such a policy, which involves repeated lockdowns, has repercussions not only on growth but also on inflationary pressure. With this in mind, the inflationary outlook remains uncertain insofar as supply chain bottlenecks could stop improving or worse, deteriorate once again.

Risk and Trend	Description
	The war in Ukraine and extreme weather events have proven just how vulnerable the global economy is to such shocks. The sharp rise in inflation in 2022 is presenting another risk, i.e., the risk of spiralling inflation created by higher wages. In fact, the inflationary shock has prompted employees to demand compensation for their lost buying power, which could subsequently compel businesses to raise prices in order to maintain margins, thus creating a vicious cycle. If this scenario of unchecked inflation above central bank targets were to occur, the central banks could move towards a much tighter monetary policy by hiking interest rates even higher. Given that interest rates have remained quite low over the past few years, market participants seeking additional returns may have engaged in excessive risk-taking strategies and would not be immune from negative repercussions should interest rates suddenly spike higher. This would serve as a major headwind for the real estate sector and Canadian households, which have seen their debt levels rise sharply over the past few years. Lastly, climate issues are an added risk in the current context. If too few measures are adopted on the climate front, severe weather events will intensify and result in economic woes over the long term. Conversely, a too-swift transition could result in other risks, particularly short- and medium-term costs and rising pressure on production costs. In short, given the ongoing uncertainties in this environment, the Bank remains vigilant in the face of numerous factors and is continuing to rely on its strong risk management framework to identify, assess, and mitigate the negative impacts while also remaining within its risk appetite limits.
Climate change	In accordance with the TCFD's recommendations, the Bank has identified two types of direct climate-change-related risks (climate risk), i.e., physical risks and transition risks. Physical risks refer to the potential impacts of more frequent and more intense extreme weather events and/or of chronic changes in weather conditions on physical assets, infrastructures, the value chain, productivity, and other physical aspects. Transition risks refer to the potential impacts of moving toward a low-carbon economy (such as technological changes, behavioural changes by consumers, or political or public policy shifts designed to reduce GHG emissions through taxes or incentives) as well as to regulatory changes made to manage and support such an economy. In addition to these two risks are indirect risks, such as the risk of lawsuits, reputation risk, and regulatory compliance risk in an environment that is constantly changing due to ongoing and upcoming initiatives enacted by governments and regulators. Climate risk could have an impact on the traditional risks that are inherent to a financial institution's operations, including credit risk, market risk, liquidity and funding risk, and operational risk, among others. Managing climate risk has become increasingly important, as evidenced by the interest level in this risk, aligned over a societal, political, and regulatory landscape in constant flux, shown by the Bank's stakeholders, in particular clients, shareholders, governments, and regulators. This past year, several initiatives and public consultations were announced, including OSFI's guideline B-15, *Climate Risk Management*, the International Sustainability Standards Board's initiative to establish a financial disclosure framework addressing sustainability and climate; and the CSA's proposed *National Instrument 51-107 – Disclosure of Climate–related matters*. Other announcements include the Government of Canada's *2030 Emissions Reduction Plan* and the Government of Quebec's *Plan for a Green Economy*. It is possible that the Bank's or its clients' business models fail to align with a low-carbon economy or that their responses to government strategies and regulatory changes prove inadequate or fail to achieve the target objectives. Another possibility is that events caused by physical risks prove catastrophic (extreme episodes) or that there are adaptability issues (chronic episodes). As such, these risks could result in financial losses for the Bank, affect its business activities and how they are conducted, harm its reputation and increase its regulatory compliance risk, or even affect the activities and financial position of the clients to whom it offers financial services. The actual impact of climate risk will depend on future events that are beyond the Bank's control. The Bank must therefore devote special attention to reducing its exposure to these negative outside factors and, at the same time, to seizing new growth opportunities. Its strategies and policies have therefore been designed to consider climate risks while also supporting the transition to a low-carbon economy. The Bank constantly strives to remain apprised of best practices and to support and advise its clients in their move to a low-carbon economy. From this perspective, we will continue to deliver climate risk management training across the organization, in particular among front-line employees who have direct contact with clients. To better understand and mitigate climate change risks, the Bank also takes part in major national and international financial initiatives, including TCFD, the United Nations Principles for Responsible Banking (UNPRB), the United Nations Principles for Responsible Investing (UNPRI), and others. However, it cannot predict the effectiveness of government-led climate strategies or of regulatory changes enacted, nor can it assume responsibility for achieving the objectives set out in these strategies and changes. The Bank continues to closely monitor developments on this topic and to deploy its climate change risk management framework. For additional information, see the Environmental and Social Risk section of this MD&A.

Risk and Trend	Description
Information security and cybersecurity	Technology, which is now omnipresent in our daily lives, is at the heart of banking services and has become the main driver of innovation in the financial sector. While this digital transformation meets the growing needs of customers by enhancing the operational efficiency of institutions, it nevertheless comes with information security and cybersecurity risks. The personal information and financial data of financial institution customers are prime targets for criminals. These criminals, who are increasingly well organized and employing ever more sophisticated schemes, try to use technology to steal information. Faced with a resurgence of cyberthreats and the sophistication of cybercriminals, the Bank is exposed to the risks associated with data breaches, malicious software, unauthorized access, hacking, phishing, identity theft, intellectual property theft, asset theft, industrial espionage, and possible denial of service due to activities causing network failures and service interruptions. Cyberattacks, as with breaches or interruptions of systems that support the Bank and its customers, could cause client attrition; financial loss; an inability of clients to do their banking; non-compliance with privacy legislation or any other current laws; legal disputes; fines; penalties or regulatory action; reputational damage; compliance costs, corrective measures, investigative, or restoration costs; cost hikes to maintain and upgrade technological infrastructures and systems, all of which could affect the Bank's operating results or financial position, in addition to having an impact on its reputation. It is also possible for the Bank to be unable to prevent or implement effective preventive measures against every potential cyberthreat, as the tactics used are multiplying, change frequently, come from a wide range of sources, and are increasingly sophisticated. Within this context, the Bank works to ensure the integrity and protection of its systems and the information they contain. The Bank reaffirms its commitment to continuous improvement in the area of information security, the ultimate goal being to protect its customers and maintain their trust. Along with its partners in the financial sector and with the regulatory authorities, the Bank is committed to making a sustained effort to mitigate technology risks. Measures specifically directed at anticipating this type of threat include the formation of multidisciplinary teams comprising cybersecurity and fraud prevention specialists. The Bank is also pursuing initiatives under its own cybersecurity program aimed at adapting its protection, surveillance, detection, and response capabilities according to changing threats, the aim being to continue to reduce delays in detecting any anomalies or cybersecurity incidents and limiting the impact thereof as much as possible. A governance and accountability structure has also been established to support decision-making based on sound risk management. The Technology Committee is regularly informed of the cybersecurity posture, of cybersecurity trends and developments, and of lessons learned from operational incidents that have occurred in other large organizations such that it can gain a better understanding of risks, particularly risks related to cybersecurity and the protection of personal information.
Protection of personal information	Risks related to protecting personal information exist through the entire lifecycle of information and arise, in particular, from inadequate control measures and weak processes. Such risks could also arise from information being improperly created, collected, used, communicated, stored, or destroyed. Greater attention will be paid to the collection, use, and communication of personal information as well as the management and governance applied to such information as the Bank continues to invest in technological solutions and innovations and according to the evolution of its commercial activities. Risks related to the protection of personal information could cause client attrition; financial loss; non-compliance with legislation; legal disputes; fines; penalties; punitive damages; regulatory action; reputational damage; compliance, remediation, investigative, or restoration costs; cost hikes to maintain and upgrade technological infrastructures and systems, all of which could affect the Bank's operating results or financial position, in addition to having an impact on its reputation. In recent years, innovations and the proliferation of technological solutions that collect, use, and communicate personal information such as cloud computing, artificial intelligence, automated learning and open banking, have given rise to significant legislative changes in many jurisdictions, including Canada and Quebec. For example, in September 2021, the Quebec government passed *An Act to modernize legislative provisions as regards the protection of personal information,* which will gradually come into effect over the next three years. And on June 16, 2022, the federal government tabled Bill C-27 entitled *Digital Charter Implementation Act, 2022*, which aims to enhance and modernize the personal information protection framework. The Bank continues to monitor relevant legislative developments and has bolstered its governance structure by updating its policies, standards and practices and by deploying a personal information privacy program that reflects its determination to maintain the trust of its clients.

Risk and Trend	Description
Reliance on technology and third-party providers	The Bank's clients have high expectations regarding the accessibility to products and services that are offered on various platforms that house substantial amounts of data. In response to those heightened client expectations, to the rapid pace of technological change, and to the growing presence of new actors in the banking sector, the Bank diligently makes significant and ongoing investments in its technology while maintaining the operational resilience and robustness of its controls. Inadequate implementation of technological improvements or new products or services could significantly affect the Bank's ability to serve and retain clients. Third parties provide essential components of the Bank's technological infrastructure such as Internet connections and access to network and other communications services. The Bank also relies on the services of third parties to support certain business processes and to handle certain IT activities. An interruption of these services or a breach of security could have an unfavourable impact on the Bank's ability to provide products and services to its customers and to conduct business, not to mention the impact that such events would have on the Bank's reputation. To mitigate this risk, the Bank has a third-party risk management framework wherein information security, financial health, and performance are validated before any agreements are reached and throughout the life of the agreements. It also includes business continuity plans, which are tested periodically to ensure their effectiveness in times of crisis. A governance and accountability structure has also been established to support decision-making based on sound risk management. Despite these preventive measures and the efforts deployed by the Bank to manage third parties, there remains a possibility that certain risks will materialize. In such cases, the Bank would rely on mitigation mechanisms developed in collaboration with the various agreement owners and third parties concerned. Aware of the significance of third-party risk, the Bank makes sure that its practices evolve in collaboration with its financial sector partners and with regulatory authorities.
Technological innovation and competition	On the one hand, the Bank's financial performance depends on its ability to develop and market new and innovative products and services, adopt and develop new technologies that help differentiate its product and services and generate cost savings, and market these new products and services at the right time and at competitive prices. On the other hand, failure to properly review critical changes within the business before and during the implementation and deployment of key technological systems or failure to align client expectations with the Bank's client commitments and operating capabilities could adversely affect the Bank's business, operating results, financial position, and reputation. The transition toward new digital channels and solutions has accelerated greatly following the COVID-19 pandemic, where demand for digital banking services grew to the detriment of traditional banking services. The arrival of new, non-conventional players in the market has intensified competitive pressure, as they are proposing to enhance client experience with new technologies, data analysis tools, and customized solutions in a simplified and more cost-effective manner. These businesses are not necessarily subject to the same regulatory requirements as financial institutions and may sometimes be able to react more quickly to new consumer habits. As such, to mitigate disintermediation risk and help make innovative technologies accessible to its clients, the Bank continues to incorporate artificial intelligence into its business processes and remains highly committed to innovation by making strategic investments in emerging technologies through its specialized venture capital arm, NAventures.
Ability to recruit and retain key resources	The Bank's future performance depends greatly on its ability to recruit, develop, and retain key resources. There is strong competition, partly supported by a relatively low unemployment rate, in the financial services sector in terms of attracting and retaining the most qualified people, notably with the arrival of new players in certain sectors and the emergence of the global workforce concept. As a result, reports are periodically presented to the Board through the governance mechanisms of the Human Resources Committee, the aim being to deploy appropriate strategies to implement conditions favourable to the Bank's competitiveness as an employer. There is no assurance that the Bank or a business acquired by the Bank will be able to continue recruiting or retaining talented people.

Other Factors That Can Affect the Bank's Business, Operating Results, Financial Position, and Reputation

Risks Related to the COVID-19 Pandemic

The COVID-19 pandemic continues to have disruptive and adverse effects in the countries where the Bank operates and, more broadly, on the global economy, supply chains, and financial markets. The pandemic has also had, and could continue to have, repercussions on the Bank, notably on the way in which it carries out its business activities as well as on its operating results, financial position, regulatory capital and liquidity ratios, reputation, and ability to satisfy regulatory requirements, as well as on its clients, which could exacerbate certain top and emerging risks to which the Bank is exposed. Since a large part of the Bank's activities consist of granting loans or providing various liquidity channels to clients, namely, to individuals, businesses in various sectors, and governments, the impacts of the pandemic on these parties could also significantly influence the provisions for credit losses recorded by the Bank. As the pandemic evolves, certain industries and geographic sectors have been facing more persistent consequences thereof. The Bank has therefore continued to closely monitor the situation and, given the considerable degree of uncertainty surrounding the post-pandemic landscape, additional mitigation measures may be needed. The actual impacts will depend on future events that are highly uncertain, including the extent, severity, and duration of the COVID-19 pandemic, and on the effectiveness of actions and measures taken by governments, monetary authorities, and regulators over the long term.

International Risks

Through the operations of some of the Bank's units (mainly its New York and London offices) and subsidiaries in Canada and abroad (in particular, Credigy Ltd., NBC Global Finance Limited, and Advanced Bank of Asia Limited), the Bank is exposed to risks arising from its presence in international markets and foreign jurisdictions. While these risks do not affect a significant proportion of the Bank's portfolios, their impact must not be overlooked, especially those that are of a legal or regulatory nature. International risks can be particularly high in territories where the enforceability of agreements signed by the Bank is uncertain, in countries and regions facing political or socio-economic disturbances, or in countries that may be subject to international sanctions. Generally speaking, there are many ways in which the Bank may be exposed to the risks posed by other countries, not the least of which being foreign laws and regulations. In all such situations, it is important to consider what is referred to as "country risk." Country risk affects not only the activities that the Bank carries out abroad but also the business that it conducts with non-resident clients as well as the services it provides to clients doing business abroad, such as electronic funds transfers, international products, and transactions made from Canada in foreign currencies.

As part of its activities, the Bank must adhere to anti-money laundering and anti-terrorist financing (AML/ATF) regulatory requirements in effect in each jurisdiction where it conducts business. It must also comply with the requirements pertaining to current international sanctions in these various jurisdictions. Money laundering and terrorist financing is a financial, regulatory, and reputation risk. For additional information, see the Regulatory Compliance Risk Management section of this MD&A.

The Bank is exposed to financial risks outside Canada and the United States, primarily through its interbank transactions on international financial markets or through international trade finance activities. This geographic exposure represents a moderate proportion of the Bank's total risk. The geographic exposure of loans is disclosed in the quarterly *Supplementary Financial Information* report available on the Bank's website at nbc.ca. To control country risk, the Bank sets credit concentration limits by country and reviews and submits them to the Board for approval upon renewal of the Credit Risk Management Policy. These limits are based on a percentage of the Bank's regulatory capital, in line with the level of risk represented by each country, particularly emerging countries. The risk is rated using a classification mechanism similar to the one used for credit default risk. In addition to the country limits, authorization caps and limits are established, as a percentage of capital, for the world's high-risk regions, i.e., essentially all regions except for North America, Western European countries, and the developed countries of Asia.

Acquisitions

The Bank's ability to successfully complete an acquisition is often conditional on regulatory approval, and the Bank cannot be certain of the timing or conditions of regulatory decisions. Acquisitions could affect future results should the Bank experience difficulty integrating the acquired business. If the Bank does encounter difficulty integrating an acquired business, maintaining an appropriate governance level over the acquired business, or retaining key officers within the acquired business, these factors could prevent the Bank from realizing expected revenue growth, cost savings, market share gains, and other projected benefits of the acquisition.

Intellectual Property

The Bank protects the intellectual property developed by its employees in connection with their duties. However, in some cases, the Bank's ability to acquire intellectual property rights may be more limited. In addition, the intellectual property rights acquired by the Bank provide no guarantees that they will be effective in deterring or preventing a third party from misappropriating intellectual property or providing a defense against the misappropriation of intellectual property. Moreover, the goods and services developed by the Bank are provided in a competitive market where third parties could hold intellectual property rights prior to those held by the Bank. In such circumstances, there is no guarantee that the Bank will successfully provide a defense against an infringement claim, that it will be able to modify its goods and services to avoid infringing upon third party rights, or that it will obtain a licence with commercially acceptable conditions.

Judicial and Regulatory Proceedings

The Bank takes reasonable measures to comply with the laws and regulations in effect in the jurisdictions where it operates. Still, the Bank could be subject to judicial or regulatory decisions resulting in fines, damages, or other costs or to restrictions likely to adversely affect its operating results or its reputation. The Bank may also be subject to litigation in the normal course of business. Although the Bank establishes provisions for the measures it is subject to under accounting requirements, actual losses resulting from such litigation could differ significantly from the recognized amounts, and unfavourable outcomes in such cases could have a significant adverse effect on the Bank's operating results. The resulting reputational damage could also affect the Bank's future business prospects. For additional information, see Note 26 to the consolidated financial statements.

Tax Risk

The tax laws applicable to the Bank are numerous, complex, and subject to amendment at any time. This complexity can result in differing legal interpretations between the Bank and the respective tax authorities with which it deals. In addition, legislative changes and changes in tax policy, including the interpretation thereof by tax authorities and courts, could affect the Bank's earnings. International and domestic initiatives may also result in changes to tax laws and policies, including international efforts by the G20 and the Organisation for Economic Co-operation and Development to broaden the tax base and domestic proposals to increase the taxes payable by banks and insurance companies. For additional information on income taxes, see the Income Taxes section on page 52 of this MD&A, the Critical Accounting Policies and Estimates section on page 110 of this MD&A, and Note 24 to the consolidated financial statements.

Accounting Policies, Methods and Estimates Used by the Bank
The accounting policies and methods used by the Bank determine how the Bank reports its financial position and operating results and require management to make estimates or rely on assumptions about matters that are inherently uncertain. Any changes to these estimates and assumptions may have a significant impact on the Bank's operating results and financial position.

Additional Factors
Other factors that could affect the Bank's business, operating results, and reputation include unexpected changes in consumer spending and saving habits; the timely development and launch of new products and services; the ability to successfully align its organizational structure, resources and processes; the ability to activate a business continuity plan within a reasonable time; the potential impact of international conflicts, natural disasters or public health emergencies such as COVID-19; and the Bank's ability to foresee and effectively manage the risks resulting from these factors through rigorous risk management.

Credit Risk

Credit risk is the risk of incurring a financial loss if an obligor does not fully honour its contractual commitments to the Bank. Obligors may be debtors, issuers, counterparties, or guarantors. Credit risk is the most significant risk facing the Bank in the normal course of its business. The Bank is exposed to credit risk not only through its direct lending activities and transactions but also through commitments to extend credit and through letters of guarantee, letters of credit, over-the-counter derivatives trading, debt securities, securities purchased under reverse repurchase agreements, deposits with financial institutions, brokerage activities, and transactions carrying a settlement risk for the Bank such as irrevocable fund transfers to third parties via electronic payment systems.

Governance

A policy framework centralizes the governance of activities that generate credit risk for the Bank and its subsidiaries and is supplemented by a series of subordinate internal policies and standards. These policies and standards address specific management issues such as concentration limits by borrower group and sector, credit limits, collateral requirements, and risk quantification or issues that provide more thorough guidance for given business segments.

For example, the institutional activities of the Bank and its subsidiaries on financial markets and international commercial transactions are governed by business unit directives that set out standards adapted to the specific environment of these activities. This also applies to retail brokerage subsidiaries. In isolated cases, a business unit or subsidiary may have its own credit policy, and that policy must always fall within the spirit of the Bank's policy framework. Risk Management's leadership team defines the scope of the universe of subsidiaries carrying significant credit risks and the magnitude of the risks incurred.

Credit risk is controlled through a rigorous process that comprises the following elements:

- credit risk rating and assessment;
- economic capital assessment;
- stress testing;
- credit granting process;
- revision and renewal process;
- risk mitigation;
- follow-up of monitored accounts and recovery;
- counterparty risk assessment;
- settlement risk assessment;
- environmental risk assessment.

Concentration Limits
The Bank sets credit concentration and settlement limits by obligor group, by industry sector, by country, and by region. These limits are subject to the approval of the RMC. Certain types of financing or financing programs are also subject to specific limits. Breaches of concentration limits by obligor group or by region are reported to the RMC each quarter. Furthermore, every industry sector, country, and region whose exposure equals a predetermined percentage of the corresponding authorized limit are reported to the Bank's Risk Management leadership team. At least once a year, the Bank revises these exposures by industry sector, by country, and by region in order to determine the appropriateness of the corresponding concentration limits.

Reporting

Every quarter, an integrated risk management report is presented to senior management and the RMC. It presents changes in the credit portfolio and highlights on the following matters:

- credit portfolio volume growth by business segment;
- a breakdown of the credit portfolio according to various criteria for which concentration limits have been set;
- changes in provisions and allowances for credit losses;
- changes in impaired loans;
- follow-up of monitored accounts.

Credit Risk Rating and Assessment

Before a sound and prudent credit decision can be made, an obligor's or counterparty's credit risk must be accurately assessed. This is the first step in processing credit applications. Using a credit rating system developed by the Bank, each application is analyzed and assigned one of 19 grades on a scale of 1 to 10 for all portfolios exposed to credit risk. As each grade corresponds to a debtor's, counterparty's, or third party's probability of default, the Bank can estimate the credit risk. The credit risk assessment method varies according to portfolio type. There are two main methods for assessing credit risk, i.e., the Advanced Internal Ratings-Based (AIRB) Approach and the Standardized Approach, as defined by the Basel Accord, to determine minimum regulatory capital requirements for most of its portfolios.

The main parameters used to measure the credit risk of loans outstanding and undrawn amounts under the AIRB Approach are as follows:

- probability of default (PD), which is the probability of through-the-cycle 12-month default by the obligor, calibrated on a long-run average PD throughout a full economic cycle;
- loss given default (LGD), which represents the magnitude of the loss from the obligor's default that would be expected in an economic downturn and subject to certain regulatory floors, expressed as a percentage of exposure at default;
- exposure at default (EAD), which is an estimate of the amount drawn and of the expected use of any undrawn portion prior to default, and cannot be lower than the current balance.

The methodology as well as the data and the downturn periods used to estimate LGD are described below.

AIRB APPROACH	DATA[1]	DOWNTURN PERIOD[1]	METHODOLOGY FOR CALCULATING LGD
Retail	The Bank's internal historical data from 1996 to 2021	1996-1998 and 2008-2009	LGD based on the Bank's historical internal data on recoveries and losses
Corporate	The Bank's internal historical data from 2000 to 2021 Benchmarking results using: • Moody's observed default price of bonds, from 1983 to 2021 • Global Credit Data Consortium historical loss and recovery database from 1998 to 2021	2000-2003, 2008-2009 and 2020	LGD based on the Bank's historical recoveries and losses internal data and on Moody's data
Sovereign	Moody's observed default price of bonds, from 1983 to 2015 S&P rating history from 1975 to 2016	1999-2001 and 2008-2012	Based on implied market LGD using observed bond price decreases following the issuer's default
Financial institutions	Global Credit Data Consortium historical loss and recovery database from 1991 to 2013	1991-1992, 1994, 1997-1998, 2001-2002, and 2008-2009	Model for predicting LGD based on different issue- and issuer-related risk drivers

(1) The performance of the models resulting from the AIRB Approach is measured quarterly, and the methodologies are validated by an independent third party annually. A report on model performance under the AIRB Approach is presented annually to the RMC. According to the most recent performance report, the models continue to perform well and do not require the addition of new data.

Personal Credit Portfolios

This category comprises portfolios of residential mortgage loans, consumer loans, and loans to certain small businesses. To assess credit risk, AIRB models are in place for the main portfolios, particularly mortgage loans, home equity lines of credit, credit cards, budget loans, lines of credit, and SME retail. A risk analysis based on loan grouping in pools of homogeneous obligor and product profiles is used for overall management of personal credit portfolios. This personal credit assessment approach, which has proven particularly effective for estimating credit defaults and losses, takes a number of factors into account, namely:

- Attributes from credit rating agencies (scoring) related to behaviour;
- loan product characteristics;
- collateral provided;
- the length of time on the Bank's balance sheet;
- loan status (active, delinquent, or defaulted).

This mechanism provides adequate risk measurement inasmuch as it effectively differentiates risk levels by pool. Therefore, the results are periodically reviewed and, if necessary, adjustments are made to the models. Obligor migrations between pools are among the factors considered when assessing credit risk.

Loan pools are also established based on PD, LGD, and EAD, which are measured based on the characteristics of the obligor and the transaction itself. The credit risk of these portfolios is estimated using credit scoring models that determine the obligor's PD. LGD is estimated based on transaction-specific factors such as loan product characteristics (for example, a line of credit versus a term loan), loan-to-value ratio, and types of collateral.

Credit scoring models are also used to grant credit. These models use proven statistical methods that measure an obligor's demand characteristics and history based on internal and external historical information to estimate the obligor's future credit behaviour and assign a probability of default. The underlying data include obligor information such as current and past employment, historical loan data in the Bank's management systems, and information from external sources such as credit rating agencies.

The Bank also uses behaviour scoring models to manage and monitor current commitments. The risk assessment is based on statistical analyses of the past behaviour of obligors with which the Bank has a long-term relationship in an effort to predict their future behaviour. The underlying information includes the obligor's cash flows and borrowing trends. Information on characteristics that determine behaviour in these models also comes from both internal sources on current commitments and external sources. The table on the following page presents the PD categories and credit quality of the associated personal credit portfolio.

Mortgage Loan Underwriting

To mitigate the impact of an economic slowdown and ensure the long-term quality of its portfolio, the Bank uses sound risk management when granting residential mortgages to confirm: (i) the obligor's intention to meet its financial obligations, (ii) the obligor's ability to repay its debts, and (iii) the quality of the collateral. In addition, in accordance with the applicable rules, the Bank takes a prudent approach to client qualification by using, for example, a higher interest rate to mitigate the risk of short- or medium-term rate hikes.

Nonetheless, the risk of economic slowdown could adversely affect the profitability of the mortgage portfolio. In stress test analyses, the Bank considers a variety of scenarios to measure the impact of adverse market conditions. In such circumstances, our analyses show significantly higher credit losses, which would decrease profitability and reduce the Bank's capital ratios.

New Regulatory Developments

On December 17, 2021, OSFI confirmed the qualifying rate for uninsured mortgages (i.e., residential mortgages with a down payment of 20% or more) will remain as the greater of the mortgage contract interest rate plus 2% and a minimum floor of 5.25%. OSFI is well aware that the country's post-pandemic economic recovery must be backed by a strong financial system capable of supporting the Canadian population in the current environment and that real estate market conditions in Canada could heighten the financial risk weighing on lenders. The minimum qualifying interest rate provides an additional level of safety to ensure that borrowers would have the ability to make mortgage payments should circumstances change, e.g., in the case of reduced income or a rise in interest rates.

On June 28, 2022, OSFI published an Advisory entitled *Clarification on the Treatment of Innovative Real Estate Secured Lending Products Under Guideline B-20*. The Advisory complements the existing expectations set out in *Guideline B-20 – Residential Mortgage Underwriting Practices and Procedures*. The Advisory specifies OSFI's expectations concerning underwriting practices and procedures for reverse residential mortgages, residential mortgages with shared equity features, and combined loan plans (CLPs), notably for CLPs and the re-advanceability of credit above the 65% loan-to-value (LTV) limit. For loans that exceed the 65% LTV limit, there will be a transition period where a portion of the principal payments will go towards repaying the overall mortgage amount until it is below 65% of the original LTV ratio and not re-advanceable. The implementation date for this change is October 31, 2023.

On August 1, 2022, Quebec's consumer protection organization, the *Office de la protection du consommateur*, increased the monthly minimum payment percentage to 3.5% of the balance for credit cardholders in Quebec whose contract was issued before August 1, 2019. Annual increases of 0.5% until 2025 are planned in order to raise the monthly minimum payment percentage to the 5% minimum currently applicable to contracts issued in Quebec after August 1, 2019. The purpose of these measures is to help households avoid debt issues and to reduce the risk of loss among lenders.

The objective of Bill 53 is to tighten the regulatory framework governing credit assessment agents and ensure that Quebec consumers can access protection measures, including security freezes of their credit files, which would limit access to lenders for credit authorization purposes. This measure is expected to come into force on February 1, 2023.

Business and Government Credit Portfolios

This category comprises business (other than some small businesses that are classified in personal credit portfolios), government, and financial institution credit portfolios.

These credit portfolios are assigned a risk rating that is based on a detailed individual analysis of the financial and non-financial aspects of the obligor, including the obligor's financial strength, sector of economic activity, competitive ability, access to capital management quality, and number of years in business. The Bank uses risk-rating tools and models to specifically assess the risk represented by an obligor in relation to its industry and peers. The models used are adapted to the obligor's broad sector of activity. Models are in place for ten sectors: business/commercial, large business, financial institutions, sovereigns, investment funds, energy, real estate, agriculture, insurance, and public-private partnership project financing.

This risk assessment method assigns a default risk rating to an obligor that reflects its credit quality. To each default credit risk rating corresponds a PD (see the table below). Using this classification of obligor credit risk, the Bank can differentiate appropriately between the various assessments of an obligor's capacity to meet its contractual obligations. Default risk ratings are assigned according to an assessment of an obligor's commercial and financial risks based on a solvency review. Various risk quantification models, described below, are used to perform this assessment.

The business and government default risk rating scale used by the Bank is similar to the systems used by major external rating agencies. The following table presents a grouping of the ratings by major risk category and compares them with the ratings of two major rating agencies.

Internal Default Risk Ratings*

Description[1]	Personal credit portfolios	Business and government credit portfolios				
	PD (%) – Retail	Ratings	PD (%) – Corporate and financial institutions	PD (%) – Sovereign	Standard & Poor's	Moody's
Excellent	0.000–0.144	1–2.5	0.000–0.112	0.000–0.060	AAA to A-	Aaa to A3
Good	0.145–0.506	3–4	0.112–0.384	0.060–0.331	BBB+ to BBB-	Baa1 to Baa3
Satisfactory	0.507–2.681	4.5–6.5	0.384–4.235	0.331–5.738	BB+ to B	Ba1 to B2
Special mention	2.682–9.348	7–7.5	4.235–10.182	5.738–17.964	B- to CCC+	B3 to Caa1
Substandard	9.349–9.999	8–8.5	10.182–99.999	17.964–99.999	CCC & CCC-	Caa2 & Caa3
Default	1	9–10	100	100	CC, C & D	Ca, C & D

(1) Additional information is provided in Note 7 – *Loans and Allowances for Credit Losses* to the consolidated financial statements.

The Bank also uses individual assessment models by industry to assign a risk rating to the credit facility based on the collateral that the obligor is able to provide and, in some cases, based on other factors. The Bank consequently has a bi-dimensional risk-rating system that, using models and internal and external historical data, establishes a default risk rating for each obligor. In addition, the models assign, to each credit facility, an LGD risk rating that is independent of the default risk rating assigned to the obligor.

The Bank's default risk ratings and LGD risk ratings as well as the related risk parameters contribute directly to informed credit-granting, renewal, and monitoring decisions. They are also used to determine and analyze risk-based pricing. In addition, from a credit portfolio management perspective, they are used to establish counterparty credit concentration limits and segment concentration limits as well as limits to decision-making power and to determine the credit risk appetite of these portfolios. Moreover, they represent an important component in estimating expected and unexpected losses, measuring minimum required economic capital, and measuring the minimum level of capital required, as prescribed by the regulatory authorities.

The credit risk of obligors and of their facilities is assessed with the PD and LGD parameters at least once a year or more often if significant changes (triggers) are observed when updating financial information or if another qualitative indicator of a deterioration in the obligor's solvency or in the collateral associated with the obligor's facilities is noted. The Bank also uses a watchlist to more actively monitor the financial position of obligors whose default-risk rating is greater than or equal to 7.0. This process seeks to minimize an obligor's default risk and allows for proactive credit risk management.

Validation

The Risk Management Group monitors the effectiveness of the risk-rating systems and associated parameters, which are also reviewed regularly in accordance with the Bank's policies. Backtesting is performed at regular intervals to validate the effectiveness of the models used to estimate PD, LGD, and EAD. For PD in particular, this backtesting takes the form of sequentially applied measures designed to assess the following criteria:

- the model's discriminatory power;
- the proportion of overrides;
- model calibration;
- the stability of the model's inputs and outputs.

The credit risk quantification models are developed and tested by a team of specialists with model performance being monitored by the applicable business units and related credit risk management services. Models are validated by a unit that is independent of both the specialists who developed the model and the concerned business units. Approvals of new models or changes to existing models are subject to an escalation process established by the model risk management policy. Furthermore, new models or changes to existing models that markedly impact regulatory capital must be approved by the Board before being submitted to the regulatory agencies.

The facility and default risk-rating systems, methods, and models are also subject to periodic independent validation, the frequency of which depends on the model's risk level. Models that have a significant impact on regulatory capital must be reviewed regularly, thereby further raising the certainty that these quantification mechanisms are working as expected.

The key aspects to be validated are risk factors allowing for accurate classification of default risk by level, adequate quantification of exposure, use of assessment techniques that consider external factors such as economic conditions and credit status and, lastly, compliance with internal policies and regulatory provisions.

The Bank's credit risk assessment and rating systems are overseen by the Models Oversight Committee, the GRC, and the RMC, and these systems constitute an integral part of a comprehensive Bank-wide credit risk oversight framework. Along with the above-mentioned elements, the Bank documents and periodically reviews the policies, definitions of responsibilities, resource allocation, and existing processes.

Assessment of Economic Capital

The assessment of the Bank's minimum required economic capital is based on the credit risk assessments of obligors. These two activities are therefore interlinked. The different models used to assess the credit risk of a given portfolio type also enable the Bank to determine the default correlation among obligors. This information is a critical component in the evaluation of potential losses for all portfolios carrying credit risk. Estimates of potential losses, whether expected or not, are based on historical loss experience, portfolio monitoring, market data, and statistical modelling. Expected and unexpected losses are factors used in assessing the minimum required economic capital for all of the Bank's credit portfolios. The assessment of economic capital also considers the anticipated potential migrations of the default risk ratings of obligors during the remaining term of their credit commitments. The main risk factors that have an impact on economic capital are as follows:

- the obligor's PD;
- the obligor's EAD;
- the obligor's LGD;
- the default correlation among various obligors;
- the residual term of credit commitments;
- the impact of economic and sector-based cycles on asset quality.

Stress Testing

The Bank carries out stress tests to evaluate its sensitivity to crisis situations in certain activity sectors and key portfolios. A global stress test methodology covers most business, government, and personal credit portfolios to provide the Bank with an overview of the situation. By simulating specific scenarios, these tests enable the Bank to measure allowances for credit losses according to IFRS 9 – *Financial Instruments* (IFRS 9), to assess the level of regulatory capital needed to absorb potential losses, and to determine the impact on its solvency. In addition, these tests contribute to portfolio management as they influence the determination of concentration limits by obligor, product, or business sector.

Credit-Granting Process

Credit-granting decisions are based first and foremost on the results of the risk assessment. Aside from an obligor's solvency, credit-granting decisions are also influenced by factors such as available collateral and guarantees, transaction compliance with policies, standards and procedures, and the Bank's overall risk-adjusted return objective. Each credit-granting decision is made by authorities within the risk management teams and management, who are independent of the business units and are at a reporting level commensurate with the size of the proposed credit transaction and the associated risk. Decision-making authority is determined in compliance with the delegation of authority set out in the Credit Risk Management Policy. A person in a senior position in the organization approves credit facilities that are substantial or carry a higher risk for the Bank. The GRC approves and monitors all substantial credit facilities. Credit applications that exceed management's latitudes are submitted to the Board for approval. The credit-granting process demands a high level of accountability from managers, who must proactively manage the credit portfolio.

Review and Renewal Processes

The Bank periodically reviews credit files. The review process enables the Bank to update information on the quality of the facilities and covers, among other things, risk ratings, compliance with credit conditions, and obligor behaviour. In the specific case of business credit portfolios, the credit risk of all obligors is reviewed at least once per year. After this periodic review, for on-demand or unused credit, the Bank decides whether to pursue its business relationship with the obligor and, if so, revises the credit conditions. For personal credit portfolios, the credit risk of all obligors is reviewed on a continual basis.

Risk Mitigation

The Bank also controls credit risk using various risk mitigation techniques. In addition to the standard practice of requiring collateral to guarantee repayment of the credit it grants, the Bank also uses protection mechanisms such as credit derivative financial instruments, syndication, and loan assignments as well as an orderly reduction in the amount of credit granted.

The most common method used to mitigate credit risk is obtaining quality collateral from obligors. Obtaining collateral cannot replace a rigorous assessment of an obligor's ability to meet its financial obligations, but, beyond a certain risk threshold, it is an essential complement. The obtaining of collateral depends on the level of risk presented by the obligor and the type of loan granted. The legal validity and enforceability of any collateral obtained and the Bank's ability to regularly and correctly measure the collateral's value are critical for this mechanism to play its proper role in risk mitigation.

In its internal policies and standards, the Bank has established specific requirements regarding the appropriate legal documentation and assessment for the kinds of collateral that business units may require to guarantee the loans granted. The categories of eligible collateral and the lending value of the collateralized assets have also been defined by the Bank. For the most part, they include the following asset categories as well as guarantees (whether secured by collateral or unsecured) and government and bank guarantees:

- accounts receivable;
- inventories;
- machinery and equipment and rolling stock;
- residential and commercial real estate, office buildings and industrial facilities;
- cash and marketable securities.

Portfolio Diversification and Management

The Bank is exposed to credit risk, not only through outstanding loans and undrawn amounts of commitments to a particular obligor but also through the sectoral distribution of the outstanding loans and undrawn amounts and through the exposure of its various credit portfolios to geographical, concentration, and settlement risks.

The Bank's approach to controlling these diverse risks begins with a diversification of exposures. Measures designed to maintain a healthy degree of credit risk diversification in its portfolios are set out in the Bank's policies, standards, and procedures. These instructions are mainly reflected in the application of various exposure limits: credit concentration limits by counterparty and credit concentration limits by business sector, country, region, product, and type of financial instrument. These limits are determined based on the Bank's credit risk appetite framework and are reviewed periodically. Compliance with these limits, particularly exceptions, is monitored through periodic reports submitted by the Risk Management Group's officers to the Board.

Continuous analyses are performed in order to anticipate problems with a sector or obligor before they materialize, notably as defaulted payments.

Other Risk Mitigation Methods

Credit risk mitigation measures for transactions in derivative financial instruments, which are regularly used by the Bank, are described in detail in the Counterparty Risk section.

Credit Derivative Financial Instruments and Financial Guarantee Contracts

The Bank also reduces credit risk by using the protection provided by credit derivative financial instruments such as credit default swaps. When the Bank acquires credit protection, it pays a premium on the swap to the counterparty in exchange for the counterparty's commitment to pay if the underlying entity defaults or another event involving the counterparty and covered by the legal agreement occurs. Since, like obligors, providers of credit protection must receive a default risk rating, the Bank's standards set out all the criteria under which a counterparty may be judged eligible to mitigate the Bank's credit risk. The Bank may also reduce its credit risk by entering into financial guarantee contracts whereby a guarantor indemnifies the Bank for a loss resulting from an obligor failing to make a payment when due in accordance with the contractual terms of a debt instrument.

Loan Syndication

The Bank has developed specific instructions on the appropriate objectives, responsibilities, and documentation requirements for loan syndication.

Follow-Up of Monitored Accounts and Recovery
Credit granted and obligors are monitored on an ongoing basis and in a manner commensurate with the degree of risk. Loan portfolio managers use an array of intervention methods to conduct a particularly rigorous follow-up on files that show a high risk of default, and they submit comments to credit risk management groups about each identified borrower on the watchlist for whom they are responsible. When loans continue to deteriorate and there is an increase in risk to the point where monitoring has to be increased, a group specialized in managing problem accounts (Work Out units) steps in to maximize collection of the disbursed amounts and tailor strategies to these accounts.

Each quarter, the Work Out units submit a monitoring report (called a watchlist) to a monitoring committee that tracks the status of at-risk obligors and the corrective measures undertaken. In addition, files in which the authorized amount is $5 million and up are presented to the Watchlist Committee, which in turn reviews the action plans and watchlist reports. The authority to approve allowances for credit losses is attributed using limits delegated on the basis of hierarchical level presented in the Credit Risk Management Policy.

Information on the recognition of impaired loans and allowances for credit losses is presented in Notes 1 and 7 to the consolidated financial statements.

Forbearance and Restructuring
Situations where a business or retail obligor begins showing clear signs of potential insolvency are managed on a case-by-case basis and require the use of judgment. The Loan Work Out Policy sets out the principles applicable in such situations to guide loan restructuring decisions and identify situations where distressed restructuring applies. A distressed restructuring situation occurs when the Bank, for economic or legal reasons related to the obligor's financial difficulties, grants the obligor a special concession that is contrary to the Bank's policies. Such concessions could include a lower interest rate, waiver of principal, and extension of the maturity date.

The Bank has established a management framework for commercial and corporate obligors that represent higher-than-normal risk of default. It outlines the roles and responsibilities of loan portfolio managers with respect to managing high-risk accounts and the responsibilities of the Work Out units and other participants in the process. Lastly, the Credit Risk Management Policy and a management framework are used to determine the authorization limits for distressed restructuring situations. During fiscal years 2022 and 2021, the amount of distressed loan restructurings was not significant.

Counterparty Risk Assessment
Counterparty risk is a credit risk that the Bank incurs on various types of transactions involving financial instruments. The most significant risks are those it faces when it trades derivative financial instruments with counterparties on the over-the-counter market or when it purchases securities under reverse repurchase agreements or sells securities under repurchase agreements. Securities lending transactions and securities brokerage activities involving derivative financial instruments are also sources of counterparty risk. Note 16 to the consolidated financial statements provides a complete description of the credit risk for derivative financial instruments by type of traded product.

The Risk Management Group has developed models by type of counterparty through which it applies an advanced methodology for calculating the Bank's credit risk exposure and economic capital. The exposures are subject to limits. These limits are established based on the counterparty's internal default risk rating and on the potential volatility of the underlying assets until expiration of the contract.

Counterparty obligations related to the trading of contracts on derivative financial instruments, securities lending transactions, and reverse repurchase agreements are frequently subject to credit risk mitigation measures. The mitigation techniques are somewhat different from those used for loans and advances and depend on the nature of the instrument or the type of contract traded. The most widely used measure is the signing of master agreements: the International Swaps & Derivatives Association, Inc. (ISDA) master agreement, the Global Master Repurchase Agreement (GMRA), and the Global Master Securities Lending Agreement (GMSLA). These agreements make it possible, in the event of default, insolvency, or bankruptcy of one of the contracting parties, to apply full netting of the gross amounts of the market values for each of the transactions covered by the agreement in force at the time of default. The amount of the final settlement is therefore the net balance of gains and losses on each transaction, which reduces exposure when a counterparty defaults. The Bank's policies require that an ISDA, GMRA, or GMSLA agreement be signed with its trading counterparties to derivatives, foreign exchange forward contracts, securities lending transactions, and reverse repurchase agreements.

Another mechanism for reducing credit risk on derivatives and foreign exchange forward contracts complements the ISDA master agreement in many cases and provides the Bank and its counterparty (or either of the parties, if need be) with the right to request collateral from the counterparty when the net balance of gains and losses on each transaction exceeds a threshold defined in the agreement. These agreements, also known as Credit Support Annexes (CSA), are mandatory when financial institutions trade between each other in international financial markets since they limit credit risk while providing traders with additional flexibility to continue negotiating with the counterparty. When required by regulation, the Bank always uses this type of legal documentation in transactions with financial institutions and governments. For business transactions, the Bank prefers to use internal mechanisms, notably involving collateral and mortgages, set out in the credit agreements. The Bank's internal policies set the conditions governing the implementation of such mitigation methods.

Requiring collateral as part of a securities lending transaction or reverse repurchase agreement is not solely the result of an internal credit decision. In fact, it is a mandatory market practice imposed by self-regulating organizations in the financial services sector such as the Investment Industry Regulatory Organization of Canada (IIROC).

The Bank has identified circumstances in which it is likely to be exposed to wrong-way risk. There are two types of wrong-way risk: general wrong-way risk and specific wrong-way risk. General wrong-way risk occurs when the probability of default of the counterparties is positively correlated to general market risk factors. Specific wrong-way risk occurs when the exposure to a specific counterparty is positively correlated to the probability of default of the counterparty due to the nature of the transactions with this counterparty.

Assessment of Settlement Risk

Settlement risk potentially arises from transactions that feature reciprocal delivery of cash or securities between the Bank and a counterparty. Foreign exchange contracts are an example of transactions that can generate significant levels of settlement risk. However, the implementation of multilateral settlement systems that allow settlement netting among participating institutions has contributed greatly to reducing the risks associated with the settlement of foreign exchange transactions among banks. The Bank also uses financial intermediaries to gain access to established clearing houses in order to minimize settlement risk for certain financial derivative transactions. In some cases, the Bank may have direct access to established clearing houses for settling financial transactions such as repurchase agreements or reverse repurchase agreements. In addition, certain derivative financial instruments traded over the counter are settled directly or indirectly by central counterparties. For additional information, see the table that presents notional amounts in Note 16 to the consolidated financial statements.

There are several other types of transactions that may generate settlement risk, in particular the use of certain electronic fund transfer services. This risk refers to the possibility that the Bank may make a payment or settlement on a transaction without receiving the amount owed by the counterparty, and with no opportunity to recover the funds delivered (irrevocable settlement).

The ultimate means for completely eliminating such a risk is for the Bank to complete no payments or settlements before receiving the funds due from the counterparty. Such an approach cannot, however, be used systematically. For several electronic payment services, the Bank is able to implement mechanisms that allow it to make its transfers revocable or to debit the counterparty in the amount of the settlements before it makes its own transfer. On the other hand, the nature of transactions in financial instruments makes it impossible for such practices to be widely used. For example, on foreign exchange transactions involving a currency other than the U.S. dollar, time zone differentials impose strict payment schedules on the parties. The Bank cannot unduly postpone a settlement without facing penalties, due to the large size of the amounts involved.

The most effective way for the Bank to control settlement risks, both for financial market transactions and irrevocable transfers, is to impose internal risk limits based on the counterparty's ability to pay.

Assessment of Environmental Risk

Environmental risk can affect credit risk in that the energy transition movement and extreme weather events could result in a decreased ability to make repayments or in a decrease in the value of assets pledged as collateral. Ultimately, environmental risk can lead to both a higher probability of default and higher loss given default among counterparties. In response, the risk management framework has been expanded to include new measures that identify, assess, control, and monitor environmental risk. In addition, the Bank has developed and is gradually deploying a process used to assess and quantify the impacts of climate changes on its strategy and results. Furthermore, for clients in specific industries, the impacts of climate changes are discussed at least once a year as part of the credit granting or renewal process.

The Bank also assesses its exposure to environment-related credit risk using a variety of control and monitoring mechanisms. For example, analyses are performed on vulnerabilities to physical risks and on loan portfolio transition risks. These analyses are applied to all financing activities and provide greater visibility of the Bank's exposure to environmental risk. In addition, the Bank periodically assesses loan portfolio concentration risk to ensure that such risk is not being significantly affected by environmental risk. Furthermore, an industry sector matrix has been developed to provide the Risk Management Group with a clearer vision of the loan portfolio sectors that are most affected by climate-related risks. Thanks to these initiatives, the Bank can take concrete steps in the process used to review sectoral limits, as each business sector or industry now has an ESG section describing its environmental risk. As well, to help the Bank achieve its business objectives, the Risk Management Group created the position of Vice-President, Credit Analytics and Climate Risk, whose responsibilities consist of increasing the Bank's ability to extract business intelligence, to integrate climate risk into its decision-making processes, and to develop its climate risk analysis capacities. Regarding this latter point, the Bank has begun climate risk impact analyses using the climate scenarios recommended by the Network for Greening the Financial System (NGFS).

This year also saw the emergence of a new environmental risk issue, i.e., the potential financial repercussions of climate change on biodiversity. Financial system participants were called upon by the PRB Biodiversity Community initiative of the United Nations Environment Programme Finance Initiative (UNEP-FI), of which the Bank is a member. Similarly, as part of a Fondaction initiative the Bank took part in a one-day brainstorming exercise on biodiversity indicators for investors. As this environmental risk issue begins to emerge, the Bank will continue to closely monitor the various initiatives and contribute to deliberations about potentially incorporating this issue into both investment and credit-granting decisions. The Risk Management Group closely monitors changes in trends and calculation methods and actively participates in various industry discussion groups.

Maximum Credit Risk Exposure

The amounts in the following tables represent the Bank's maximum exposure to credit risk as at the financial reporting date without considering any collateral held or any other credit enhancements. These amounts do not include allowances for credit losses nor amounts pledged as collateral. The tables also exclude equity securities.

Maximum Credit Risk Exposure Under the Basel Asset Categories[(1)]*

(millions of Canadian dollars)								As at October 31, 2022
	Drawn[(2)]	Undrawn commitments	Repo-style transactions[(3)]	Derivative financial instruments	Other off-balance-sheet items[(4)]	Total	Standardized Approach[(5)]	AIRB Approach
Retail								
Residential mortgage	73,324	8,616	–	–	–	81,940	12 %	88 %
Qualifying revolving retail	2,483	6,920	–	–	–	9,403	– %	100 %
Other retail	17,526	2,688	–	–	35	20,249	25 %	75 %
	93,333	18,224	–	–	35	111,592		
Non-retail								
Corporate	81,763	29,811	36,194	322	5,538	153,628	13 %	87 %
Sovereign	56,253	5,821	68,906	–	326	131,306	2 %	98 %
Financial institutions	7,200	166	76,856	1,150	754	86,126	19 %	81 %
	145,216	35,798	181,956	1,472	6,618	371,060		
Trading portfolio	–	–	–	13,662	–	13,662	2 %	98 %
Securitization	4,409	–	–	–	4,373	8,782	80 %	20 %
Total – Gross credit risk	242,958	54,022	181,956	15,134	11,026	505,096	12 %	88 %
Standardized Approach[(5)]	30,704	311	24,783	1,308	4,610	61,716		
AIRB Approach	212,254	53,711	157,173	13,826	6,416	443,380		
Total – Gross credit risk	242,958	54,022	181,956	15,134	11,026	505,096	12 %	88 %

(millions of Canadian dollars)								As at October 31, 2021
	Drawn[(2)]	Undrawn commitments	Repo-style transactions[(3)]	Derivative financial instruments	Other off-balance-sheet items[(4)]	Total	Standardized Approach[(5)]	AIRB Approach
Retail								
Residential mortgage	66,791	10,578	–	–	–	77,369	9 %	91 %
Qualifying revolving retail	2,270	6,282	–	–	–	8,552	– %	100 %
Other retail	15,519	2,481	–	–	31	18,031	29 %	71 %
	84,580	19,341	–	–	31	103,952		
Non-retail								
Corporate	70,589	27,783	26,190	161	5,415	130,138	11 %	89 %
Sovereign	55,323	6,217	58,452	294	83	120,369	2 %	98 %
Financial institutions	7,228	126	72,122	2,248	619	82,343	28 %	72 %
	133,140	34,126	156,764	2,703	6,117	332,850		
Trading portfolio	–	–	–	17,010	–	17,010	– %	100 %
Securitization	3,269	–	–	–	4,206	7,475	68 %	32 %
Total – Gross credit risk	220,989	53,467	156,764	19,713	10,354	461,287	13 %	87 %
Standardized Approach[(5)]	25,009	258	26,385	2,203	3,955	57,810		
AIRB Approach	195,980	53,209	130,379	17,510	6,399	403,477		
Total – Gross credit risk	220,989	53,467	156,764	19,713	10,354	461,287	13 %	87 %

(1) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.
(2) Excludes equity securities and certain other assets such as investments in deconsolidated subsidiaries and joint ventures, right-of-use properties and assets, goodwill, deferred tax assets, and intangible assets.
(3) Securities purchased under reverse repurchase agreements and sold under repurchase agreements as well as securities loaned and borrowed.
(4) Letters of guarantee, documentary letters of credit, and securitized assets that represent the Bank's commitment to make payments in the event that an obligor cannot meet its financial obligations to third parties.
(5) Includes exposures to qualifying central counterparties (QCCP).

Market Risk

Market risk is the risk of losses arising from movements in market prices. Market risk comes from a number of factors, particularly changes to market variables such as interest rates, credit spreads, exchange rates, equity prices, commodity prices, and implied volatilities. The Bank is exposed to market risk through its participation in trading, investment, and asset/liability management activities. Trading activities involve taking positions on various instruments such as bonds, shares, currencies, commodities, or derivative financial instruments. The Bank is exposed to non-trading market risk through its asset/liability management and investment portfolios.

The trading portfolios include positions in financial instruments and commodities held either with trading intent or to hedge other elements of the trading book. Positions held with trading intent are those held for short-term resale and/or with the intent of taking advantage of actual or expected short-term price movements or to lock in arbitrage profits. These portfolios target one of the following objectives: market making, liquidating positions for clients, or selling financial products to clients.

Non-trading portfolios include financial instruments intended to be held to maturity as well as those held for daily cash management or for the purpose of maintaining targeted returns or ensuring asset and liability management.

Governance

A market risk management policy governs global market risk management across the Bank's units and subsidiaries that are exposed to this type of risk. It is approved by the GRC. The policy sets out the principles for managing market risk and the framework that defines risk measures, control and monitoring activities; sets market risk limits; and reports on breaches.

The Financial Markets Risk Committee oversees all Financial Markets segment risks that could adversely affect the Bank's results, liquidity, or capital. This committee also oversees the Financial Markets segment's risk framework to ensure that controls are in place to contain risk in accordance with the Bank's risk appetite framework.

Market risk limits ensure the link and coherence between the Bank's market risk appetite targets and the day-to-day market risk management by all parties involved, notably senior management, the business units, and the market risk sector in its independent control function. The Bank's monitoring and reporting process consists of comparing market risk exposure to alert levels and to the market risk limits established for all limit authorization and approval levels.

Assessment of Market Risk

The Risk Management Group uses a variety of risk measures to estimate the size of potential losses under more or less severe scenarios, and using both short-term and long-term time horizons. For short-term horizons, the Bank's risk measures include Value-at-Risk (VaR), Stressed VaR (SVaR), and sensitivity metrics. For long-term horizons or sudden significant market moves, including those due to a lack of market liquidity, the risk measures include stress testing across an extensive range of scenarios.

VaR and SVaR Models

VaR is a statistical measure of risk that is used to quantify market risks by activity and by risk type. VaR is defined as the maximum loss at a specific confidence level over a certain horizon under normal market conditions. The VaR method has the advantage of providing a uniform measurement of financial-instrument-related market risks based on a single statistical confidence level and time horizon.

For VaR, the Bank uses a historical price distribution to compute the probable loss levels at a 99% confidence level, using a two-year history of daily time series of risk factor changes. VaR is the maximum daily loss that the Bank could incur, in 99 out of 100 cases, in a given portfolio. In other words, the loss could exceed that amount in only one out of 100 cases.

The trading VaR is measured by assuming a holding period of one day for ongoing market risk management and a 10-day holding period for regulatory capital purposes. VaR is calculated on a daily basis both for major classes of financial instruments (including derivative financial instruments) and for all trading portfolios in the Financial Markets segment and the Bank's Global Funding and Treasury Group.

In addition to the one-day trading VaR, the Bank calculates a trading SVaR, which is a statistical measure of risk that replicates the VaR calculation method but uses, instead of a two-year history of risk factor changes, a 12-month data period corresponding to a continuous period of significant financial stress that is relevant in terms of the Bank's portfolios.

VaR methodology techniques are well suited to measuring risks under normal market conditions. VaR metrics are most appropriate as a risk measure for trading positions in liquid financial markets. However, there are limitations in measuring risks with this method when extreme and sudden market risk events occur, since they are likely to underestimate the Bank's market risk. VaR methodology limitations include the following:

- past changes in market risk factors may not always produce accurate predictions of the distribution and correlations of future market movements;
- a VaR with a daily time horizon does not fully capture the market risk of positions that cannot be liquidated or hedged within one day;
- the market risk factor historical database used for VaR calculation may not reflect potential losses that could occur under unusual market conditions (e.g., periods of extreme illiquidity) relative to the historical period used for VaR estimates;
- the use of a 99% VaR confidence level does not reflect the extent of potential losses beyond that percentile.

Given the limitations of VaR, this measure represents only one component of the Bank's risk management oversight, which also incorporates, among other measures, stress testing, sensitivity analysis, and concentration and liquidity limits and analysis.

The Bank also conducts backtesting of the VaR model. It consists of comparing the profits and losses to the statistical VaR measure. Backtesting is essential to verifying the VaR model's capacity to adequately forecast the maximum risk of market losses and thus validate, retroactively, the quality and accuracy of the results obtained using the model. If the backtesting results present material discrepancies, the VaR model could be revised in accordance with the Bank's model risk management framework. All market risk models and their performance are subject to periodic independent validation by the model validation group.

Controlling Market Risk

A comprehensive set of limits is applied to market risk measures, and these limits are monitored and reported on a regular basis. Instances when limits are exceeded are reported to the appropriate management level. The risk profiles of the Bank's operations remain consistent with its risk appetite and the resulting limits, and are monitored and reported to traders, management of the applicable business unit, senior executives, and Board committees.

The Bank also uses economic capital for market risk as an indicator for risk appetite and limit setting. This indicator measures the amount of capital that is required to absorb unexpected losses due to market risk events over a one-year horizon and with a determined confidence level. For additional information on economic capital, see the Capital Management section of this MD&A.

The following tables provide a breakdown of the Bank's Consolidated Balance Sheet into assets and liabilities by those that carry market risk and those that do not carry market risk, distinguishing between trading positions whose main risk measures are VaR and SVaR and non-trading positions that use other risk measures.

Reconciliation of Market Risk With Consolidated Balance Sheet Items

(millions of Canadian dollars)					As at October 31, 2022
		Market risk measures			
	Balance sheet	Trading[1]	Non-Trading[2]	Not subject to market risk	Non-traded risk primary risk sensitivity
Assets					
Cash and deposits with financial institutions	31,870	837	20,269	10,764	Interest rate[3]
Securities					
At fair value through profit or loss	87,375	85,805	1,570	–	Interest rate[3] and equity[4]
At fair value through other comprehensive income	8,828	–	8,828	–	Interest rate[3] and equity[5]
At amortized cost	13,516	–	13,516	–	Interest rate[3]
Securities purchased under reverse repurchase agreements and securities borrowed	26,486	–	26,486	–	Interest rate[3][6]
Loans and acceptances, net of allowances	206,744	9,914	196,830	–	Interest rate[3]
Derivative financial instruments	18,547	16,968	1,579	–	Interest rate[7] and exchange rate[7]
Defined benefit asset	498	–	498	–	Other[8]
Other	9,876	–	–	9,876	
	403,740	113,524	269,576	20,640	
Liabilities					
Deposits	266,394	15,422	250,972	–	Interest rate[3]
Acceptances	6,541	–	6,541	–	Interest rate[3]
Obligations related to securities sold short	21,817	21,817	–	–	
Obligations related to securities sold under repurchase agreements and securities loaned	33,473	–	33,473	–	Interest rate[3][6]
Derivative financial instruments	19,632	18,909	723	–	Interest rate[7] and exchange rate[7]
Liabilities related to transferred receivables	26,277	9,927	16,350	–	Interest rate[3]
Defined benefit liability	111	–	111	–	Other[8]
Other	6,250	–	77	6,173	Interest rate[3]
Subordinated debt	1,499	–	1,499	–	Interest rate[3]
	381,994	66,075	309,746	6,173	

(1) Trading positions whose risk measures are VaR as well as total SVaR. For additional information, see the table in the pages ahead that shows the VaR distribution of the trading portfolios by risk category, their diversification effect, and total trading SVaR.
(2) Non-trading positions that use other risk measures.
(3) For additional information, see the tables in the pages ahead, namely, the table that shows the VaR distribution of the trading portfolios by risk category, their diversification effect, and total trading SVaR as well as the table that shows the interest rate sensitivity.
(4) For additional information, see Note 6 to the consolidated financial statements.
(5) The fair value of equity securities designated at fair value through other comprehensive income is presented in Notes 3 and 6 to the consolidated financial statements.
(6) These instruments are recorded at amortized cost and are subject to credit risk for capital management purposes. For trading-related transactions with maturities of more than one day, interest rate risk is included in the VaR and SVaR measures.
(7) For additional information, see Notes 16 and 17 to the consolidated financial statements.
(8) For additional information, see Note 23 to the consolidated financial statements.

(millions of Canadian dollars) As at October 31, 2021

	Balance sheet	Market risk measures		Not subject to market risk	Non-traded risk primary risk sensitivity
		Trading[1]	Non-trading[2]		
Assets					
Cash and deposits with financial institutions	33,879	401	16,518	16,960	Interest rate[3]
Securities					
At fair value through profit or loss	84,811	82,995	1,816	–	Interest rate[3] and equity[4]
At fair value through other comprehensive income	9,583	–	9,583	–	Interest rate[3] and equity[5]
At amortized cost	11,910	–	11,910	–	Interest rate[3]
Securities purchased under reverse repurchase agreements and securities borrowed	7,516	–	7,516	–	Interest rate[3][6]
Loans and acceptances, net of allowances	182,689	7,827	174,862	–	Interest rate[3]
Derivative financial instruments	16,484	16,033	451	–	Interest rate[7] and exchange rate[7]
Defined benefit asset	691	–	691	–	Other[8]
Other[9]	8,058	–	–	8,058	
	355,621	107,256	223,347	25,018	
Liabilities					
Deposits	240,938	14,215	226,723	–	Interest rate[3]
Acceptances	6,836	–	6,836	–	Interest rate[3]
Obligations related to securities sold short	20,266	20,266	–	–	
Obligations related to securities sold under repurchase agreements and securities loaned	17,293	–	17,293	–	Interest rate[3][6]
Derivative financial instruments	19,367	18,999	368	–	Interest rate[7] and exchange rate[7]
Liabilities related to transferred receivables	25,170	9,058	16,112	–	Interest rate[3]
Defined benefit liability	143	–	143	–	Other[8]
Other	6,158	–	113	6,045	Interest rate[3]
Subordinated debt	768	–	768	–	Interest rate[3]
	336,939	62,538	268,356	6,045	

(1) Trading positions whose risk measures are VaR as well as total SVaR. For additional information, see the table on the following page that shows the VaR distribution of the trading portfolios by risk category, their diversification effect, and total trading SVaR.
(2) Non-trading positions that use other risk measures.
(3) For additional information, see the tables in the pages ahead, namely, the table that shows the VaR distribution of the trading portfolios by risk category, their diversification effect, and total trading SVaR as well as the table that shows the interest rate sensitivity.
(4) For additional information, see Note 6 to the consolidated financial statements.
(5) The fair value of equity securities designated at fair value through other comprehensive income is presented in Notes 3 and 6 to the consolidated financial statements.
(6) These instruments are recorded at amortized cost and are subject to credit risk for capital management purposes. For trading-related transactions with maturities of more than one day, interest rate risk is included in the VaR and SVaR measures.
(7) For additional information, see Notes 16 and 17 to the consolidated financial statements.
(8) For additional information, see Note 23 to the consolidated financial statements.
(9) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to the consolidated financial statements.

Trading Activities

The table below shows the VaR distribution of trading portfolios by risk category and their diversification effect as well as total trading SVaR, i.e., the VaR of the Bank's current portfolios obtained following the calibration of risk factors over a 12-month stress period.

VaR and SVaR of Trading Portfolios(1)(2)*

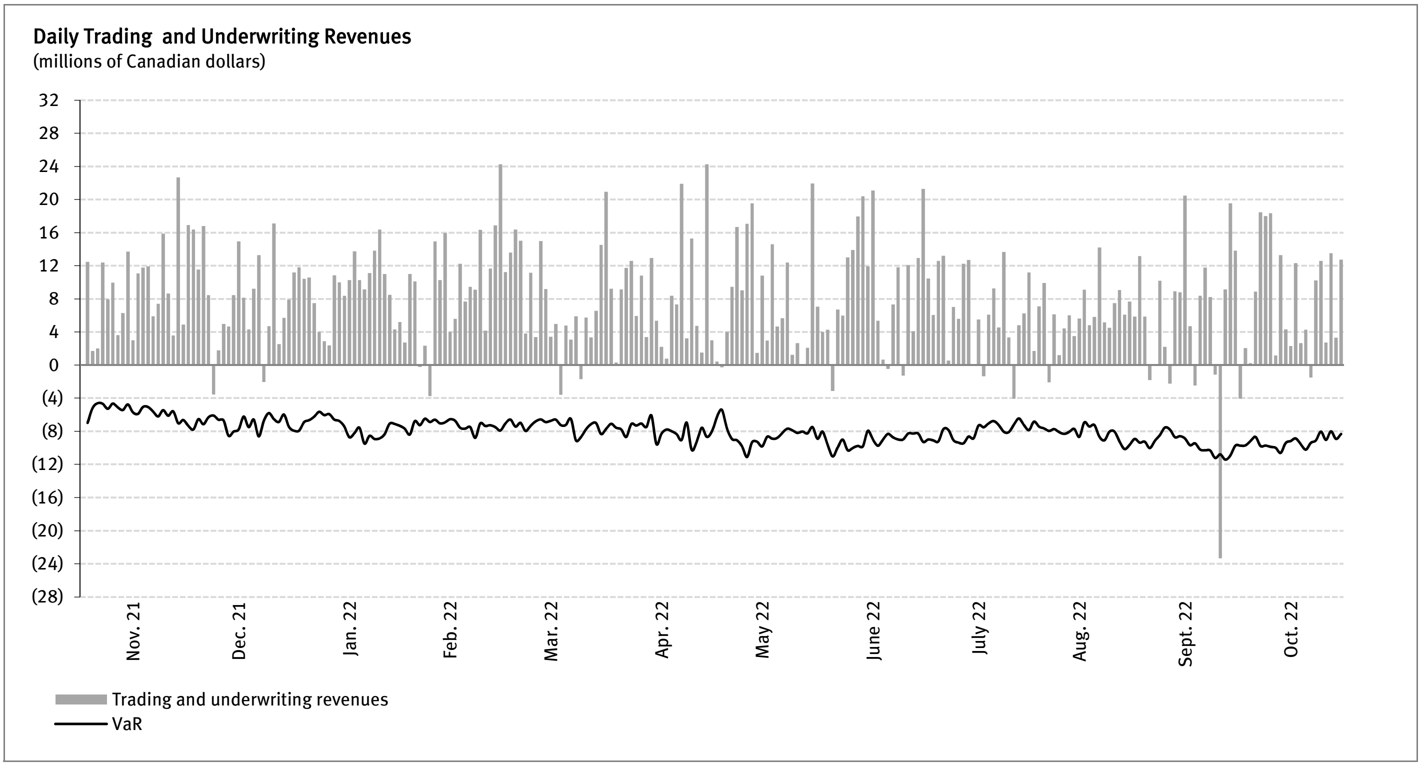
Year ended October 31 (millions of Canadian dollars)				2022				2021
	Low	High	Average	Period end	Low	High	Average	Period end
Interest rate	(3.9)	(11.3)	(5.8)	(5.2)	(4.5)	(11.0)	(7.2)	(8.2)
Foreign exchange	(0.4)	(6.9)	(2.1)	(2.1)	(0.3)	(2.3)	(0.9)	(0.9)
Equity	(4.0)	(10.6)	(7.2)	(7.1)	(4.4)	(10.2)	(6.2)	(6.0)
Commodity	(0.5)	(1.6)	(0.9)	(1.2)	(0.4)	(1.9)	(0.9)	(1.4)
Diversification effect(3)	n.m.	n.m.	8.1	7.3	n.m.	n.m.	7.8	11.3
Total trading VaR	(4.6)	(11.4)	(7.9)	(8.3)	(4.8)	(12.3)	(7.4)	(5.2)
Total trading SVaR	(5.1)	(26.2)	(14.6)	(18.8)	(6.5)	(23.1)	(13.8)	(9.5)

n.m. Computation of a diversification effect for the high and low is not meaningful, as highs and lows may occur on different days and be attributable to different types of risk.
(1) See the Glossary section on pages 122 to 125 for details on the composition of these measures.
(2) Amounts are presented on a pre-tax basis and represent one-day VaR and SVaR using a 99% confidence level.
(3) The total trading VaR is less than the sum of the individual risk factor VaR results due to the diversification effect.

The average total trading VaR stood at $7.9 million for fiscal 2022, up slightly from $7.4 million in fiscal 2021. The average total trading SVaR was also up slightly, increasing from $13.8 million in fiscal 2021 to $14.6 million in fiscal 2022. These increases were mainly driven by higher equity risk, largely offset by a lower interest rate risk.

The revenues generated by trading activities are compared with VaR as a backtesting assessment of the appropriateness of this risk measure as well as the financial performance of trading activities relative to the risk undertaken.

The table below shows daily trading and underwriting revenues and VaR. Daily trading and underwriting revenues were positive on 92% of the days for the year ended October 31, 2022. Daily trading and underwriting losses in excess of $1 million were recorded on 17 days, and on one of those days, the losses exceeded the VaR.



Stress Testing

Stress testing is a risk management technique that consists of estimating potential losses under abnormal market conditions and risk factor movements. This technique enhances transparency by exploring a range of severe but plausible scenarios.

These stress tests simulate the results that the portfolios would generate if the extreme scenarios in question were to occur. The Bank's stress testing framework, which is applied to all positions generating market risk, currently comprises the following categories of stress test scenarios:

- Historical scenarios based on past major disruption situations;
- Hypothetical scenarios designed to be forward-looking in the face of potential market stresses;
- Scenarios specific to asset classes, including:
  - sharp parallel increases/decreases in interest rates; non-parallel movements of interest rates (flattening and steepening) and increases/decreases in credit spreads;
  - sharp stock market crash coupled with a significant increase in volatility of the term structure; increase in stock prices combined with less volatility;
  - significant increases/decreases in commodity prices coupled with increases/decreases in volatility; short-term and long-term increases/decreases in commodity prices;
  - depreciation/appreciation of the U.S. dollar and of other currencies relative to the Canadian dollar.

Structural Interest Rate Risk

As part of its core banking activities, such as lending and deposit taking, the Bank is exposed to interest rate risk. Interest rate risk is the potential negative impact of interest rate fluctuations on the Bank's annual net interest income and the economic value of its equity. Activities related to hedging, investments, and term funding are also exposed to structural interest rate risk. The Bank's main exposure to interest rate risk stems from a variety of sources:

- yield curve risk, which refers to changes in the level, slope, and shape of the yield curve;
- repricing risk, which arises from timing differences in the maturity and repricing of on- and off-balance-sheet items;
- options risk, either implicit (e.g., prepayment of mortgage loans) or explicit (e.g., capped mortgages and rate guarantees) in balance sheet products;
- basis risk that is caused by imperfect correlation between different yield curves.

The Bank's exposure to structural interest rate risk is assessed and controlled mostly through the impact of stress scenarios and market shocks on the economic value of the Bank's equity and on 12-month net interest income projections. These metrics are based on cash flow projections prepared using a number of assumptions. Specifically, the Bank has developed key assumptions on loan prepayment levels, deposit redemptions, and the behaviour of customers that were granted rate guarantees. These specific assumptions were developed based on historical analyses and are reviewed frequently.

Funds transfer pricing is a process by which the Bank's business units are charged or paid according to their use or supply of funding. Through this mechanism, all funding activities as well as the interest rate risk and liquidity risk associated with those activities are centralized in the Global Funding and Treasury Group.

Active management of structural interest rate risk can significantly enhance the Bank's profitability and add to shareholder value. The Bank's goal is to maximize the economic value of its equity and its annual net interest income considering its risk appetite. This goal must be achieved within prescribed risk limits and is accomplished primarily by implementing a policy framework, approved by the GRC and submitted for information purposes to the RMC, that sets a risk tolerance threshold, monitoring structures controlled by the various committees, risk indicators, reporting procedures, delegation of responsibilities, and segregation of duties. The Bank also prepares an annual funding plan that includes the expected growth of assets and liabilities.

Governance

Management of the Bank's structural interest rate risk is mandated to the Global Funding and Treasury Group. In this role, the executives and personnel of this group are responsible for the day-to-day management of the risks inherent to structural interest rate risk hedging decisions and operations. They act as the primary effective challenge function with respect to the execution of these activities. The GRC approves and endorses the structural interest rate exposure and strategies on the recommendation of the Global Funding and Treasury Group. The Risk Management Group is responsible for assessing structural interest rate risk, monitoring activities, and ensuring compliance with the interest rate risk in the banking book policy. The Risk Management Group ensures that an appropriate risk management framework is in place and ensures compliance with the risk appetite framework and policy. Structural interest rate risk supervision is mainly provided by the Financial Markets Risk Committee. This committee reviews exposure to structural interest rate risk, the use of limits, and changes made to assumptions.

Stress Testing

Stress tests are performed on a regular basis to assess the impact of various scenarios on annual net interest income and on the economic value of equity in order to guide the management of structural interest rate risk. Stress test scenarios are performed where the yield curve level, slope, and shape are shocked. Yield curve basis and volatility scenarios are also performed. All risk factors mentioned above are covered by specific scenarios and have Board-approved or GRC-approved risk limits.

Dynamic simulation is also used to project the Bank's future net interest income, future economic value, and future exposure to structural interest rate risk. These simulations project cash flows of assets, liabilities, and off-balance-sheet products over a given investment horizon. Given their dynamic nature, they encompass assumptions pertaining to changes in volume, client term preference, prepayments of deposits and loans, and the yield curve.

The following table presents the potential before-tax impact of an immediate and sustained 100-basis-point increase or of an immediate and sustained 100 basis-point decrease in interest rates on the economic value of equity and on the net interest income of the Bank's non-trading portfolios for the next 12 months, assuming no further hedging is undertaken.

Interest Rate Sensitivity – Non-Trading Activities (Before Tax)*

As at October 31 (millions of Canadian dollars)			2022			2021
	Canadian dollar	Other currencies	Total	Canadian dollar	Other currencies	Total
Impact on equity						
100-basis-point increase in the interest rate	(191)	(24)	(215)	(277)	39	(238)
100-basis-point decrease in the interest rate	179	27	206	253	(34)	219
Impact on net interest income						
100-basis-point increase in the interest rate	128	2	130	91	17	108
100-basis-point decrease in the interest rate	(141)	(2)	(143)	(67)	(17)	(84)

Investment Governance

The Bank has created securities portfolios in liquid and less liquid securities for strategic, long-term investment, and liquidity management purposes. These investments carry market risk, credit risk, liquidity risk, and concentration risk.

The investment governance framework sets out the guiding principles and general management standards that must be followed by all those who manage portfolios of these securities included in the portfolios of the Bank and its subsidiaries. Under this investment governance framework, business units that are active in managing these types of portfolios adopt internal investment policies that set, among other things, targets and limits for the allocation of assets in the portfolios concerned and internal approval mechanisms. The primary objective is to reduce concentration risk by industry, issuer, country, type of financial instrument, and credit quality.

Overall limits in value and in proportion to the Bank's equity are set on the outstanding amount of liquid preferred shares, liquid equity securities excluding preferred shares, and instruments classified as illiquid securities in the securities portfolios. The overall exposure to common shares with respect to an individual issuer and the total outstanding amount invested in private equity funds, for investment banking services, are also subject to limits. Restrictions are also set on investments defined as special. Lastly, the Bank has a specific policy, approved by the RMC, applicable to investments in debt and equity securities, including strategic investments. Strategic investments are defined as purchases of business assets or acquisitions of significant interests in an entity for purposes of acquiring control or creating a long-term relationship.

Structural Foreign Exchange Risk

The Bank's structural foreign exchange risk arises from investments in foreign operations denominated in currencies other than the Canadian dollar. This risk, predominantly in U.S. dollars, is measured by assessing the impact of currency fluctuations on retained earnings. The Bank uses financial instruments (derivative and non-derivative) to hedge this risk. An adverse change in foreign exchange rates can also impact the Bank's capital ratios due to the amount of RWA denominated in a foreign currency. When the Canadian dollar depreciates relative to other currencies, unrealized translation gains on the Bank's net investments in foreign operations, as well as the impact on hedging transactions, are reported in other comprehensive income in shareholders' equity. In addition, the Canadian-dollar equivalent of U.S.-dollar-denominated RWA and regulatory capital deductions increases. The reverse is true when the Canadian dollar appreciates relative to the U.S. dollar. The structural foreign exchange risk is managed to ensure that the potential impacts on the capital ratios and net income are within tolerable limits set by risk policies.

Liquidity and Funding Risk

Liquidity and funding risk is the risk that the Bank will be unable to honour daily cash and financial obligations without resorting to costly and untimely measures. Liquidity and funding risk arises when sources of funds become insufficient to meet scheduled payments under the Bank's commitments. Liquidity risk stems from mismatched cash flows related to assets and liabilities as well as the characteristics of certain products such as credit commitments and non-fixed-term deposits.

The Bank's primary objective as a financial institution is to manage liquidity such that it supports the Bank's business strategy and allows it to honour its commitments when they come due, even in extreme conditions. This is done primarily by implementing a policy framework approved by the RMC, which establishes a risk appetite, monitoring structures controlled by various committees, risk indicators, reporting procedures, delegation of responsibilities, and segregation of duties. The Bank also prepares an annual funding plan that incorporates the expected growth of assets and liabilities.

<u>Regulatory Environment</u>
The Bank works closely with national and international regulators to implement regulatory liquidity standards. The Bank adapts its processes and policies to reflect its liquidity risk appetite towards these new requirements.

The *Liquidity Adequacy Requirements* (LAR) are reviewed annually to reflect domestic and international regulatory changes. They constitute OSFI's proposed liquidity framework and include six chapters:

- overview;
- liquidity coverage ratio (LCR);
- net stable funding ratio (NSFR);
- net cumulative cash flow (NCCF);
- liquidity monitoring tools;
- intraday liquidity monitoring tools.

LCR is used to ensure that banks can overcome severe short-term stress, while the NSFR is a structural ratio over a one-year horizon. The NCCF metric is defined as a monitoring tool that calculates a survival period. It is based on the assumptions of a stress scenario prescribed by OSFI that aims to represent a combined systemic and bank-specific crisis. The Bank publishes LCR and NSFR on a quarterly basis, whereas NCCF is produced monthly and communicated to OSFI.

On March 11, 2021, OSFI released, for public consultation, revisions to its LAR guideline, which was to take effect in the first quarter of 2023. OSFI is making changes that will improve the sensitivity to risk and that will ensure that financial institutions hold sufficient cash or other liquid investments to meet potential liquidity needs and to support the continued lending of credit, in particular during periods of financial stress. On November 29, 2021, OSFI postponed the implementation of the revisions to its LAR guideline to April 1, 2023.

On January 31, 2022, OSFI published a final version of the liquidity rules, which reflects the most recent Basel III reforms and, on February 16, 2022, OSFI published the corresponding changes to the regulatory return, i.e., the Net Cumulative Cash Flow (NCCF) return.

On March 31, 2022, OSFI published, for consultation purposes, a draft guideline entitled *Assurance on Capital, Leverage and Liquidity Returns*. OSFI relies largely on the regulatory returns produced by financial institutions when assessing their safety and soundness. The purpose of this draft guideline is to better inform auditors and institutions on the work to be performed on regulatory returns in order to clarify and align OSFI's assurance expectations across all financial institutions. In particular, the draft guideline addresses the assurance that must be provided by an external audit, attestation by senior management, the assurance that must be provided by an internal audit, and the proposed effective dates. The Bank is actively participating in this consultation.

The Bank continues to closely monitor regulatory developments and actively participates in various consultation processes.

Governance

The Global Funding and Treasury Group is responsible for managing liquidity and funding risk. Although the day-to-day and strategic management of risks associated with liquidity, funding, and pledging activities is assumed by the Global Funding and Treasury Group, the Risk Management Group is responsible for assessing liquidity risk and overseeing compliance with the resulting policy. The Risk Management Group ensures that an appropriate risk management framework is in place and ensures compliance with the risk appetite framework. This structure provides an independent oversight and effective challenge for liquidity, funding, and pledging decisions, strategy, and exposure.

The Bank's *Liquidity, Funding and Pledging Governance Policy* requires review and approval by the RMC, based on recommendations from the GRC. The Bank has established three levels of limits. The first two levels involve the Bank's overall cash position and are respectively approved by the Board and the GRC, whereas the third level of limits focuses more on specific aspects of liquidity risk and is approved by the Financial Markets Risk Committee. The Board not only approves the supervision of day-to-day risk management and governance but also backup plans in anticipation of emergency and liquidity crisis situations. If a limit has to be revised, the Risk Management Group with the support of the Global Funding and Treasury Group, submits the proposed revision to the approving committee.

Oversight of liquidity risk is entrusted mainly to the Financial Markets Risk Committee, whose members include representatives of the Financial Markets segment, the Global Funding and Treasury Group, and the Risk Management Group.

The Bank also has policies and guidelines governing its own collateral pledged to counterparties, given the potential impact of such asset transfers on its liquidity. In accordance with its *Liquidity, Funding and Pledging Governance Policy*, the Bank conducts simulations of potential counterparty collateral claims under the CSAs in effect in the event of a Bank downgrade or other unlikely occurrences. The simulations are based on various Bank downgrading scenarios or market value fluctuations of transactions covered by CSAs.

Through the Financial Markets Risk Committee, the Risk Management Group regularly reports changes in liquidity, funding, and pledging indicators and compliance with regulatory-, Board-, and GRC-approved limits. If control reports indicate non-compliance with the limits and a general deterioration of liquidity indicators, the Global Funding and Treasury Group takes remedial action. According to an escalation process, problematic situations are reported to management and to the GRC and the RMC. An executive report on the Bank's liquidity and funding risk management is submitted quarterly to the RMC; this report describes the Bank's liquidity position and informs the Board of non-compliance with the limits and other rules observed during the reference period as well as remedial action taken.

Liquidity Management

The Bank performs liquidity management, funding, and pledging operations not only from its head office and regional offices in Canada, but also through certain foreign centres. Although the volume of such operations abroad represents a sizable portion of global liquidity management, the Bank's liquidity management is centralized. By organizing liquidity management, funding, and pledging activities within the Global Funding and Treasury Group, the Bank can better coordinate enterprise-wide funding and risk monitoring activities. All internal funding transactions between Bank entities are controlled by the Global Funding and Treasury Group.

This centralized structure streamlines the allocation and control of liquidity management, funding, and pledging limits. Nonetheless, the *Liquidity, Funding and Pledging Governance Policy* contains special provisions for financial centres whose size and/or strategic importance makes them more likely to contribute to the Bank's liquidity risk. Consequently, a liquidity and funding risk management structure exists at each financial centre. This structure imposes a set of limits of varying levels, up to the limits approved by the RMC, on diverse liquidity parameters, including liquidity stress tests as well as simple concentration measures.

The Bank's funds transfer pricing system prices liquidity by allocating the cost or income to the various business segments. Liquidity costs are allocated to liquidity-intensive activities, mainly long-term loans, and commitments to extend credit and less liquid securities as well as strategic investments. The liquidity compensation is credited to the suppliers of funds, primarily funding in the form of stable deposits from the Bank's distribution network.

Short-term day-to-day funding decisions are based on a daily cumulative net cash position, which is controlled using liquidity ratio limits. Among these ratios and parameters, the Bank pays particular attention to the funds obtained on the wholesale market and to cumulative cash flows over various time horizons.

Moreover, the Bank's collateral pledging activities are monitored in relation to the different limits set by the Bank and are subject to monthly stress tests using various scenarios. In particular, the Bank uses various scenarios to estimate the potential amounts of additional collateral that would be required in the event of a downgrade to the Bank's credit rating.

Liquidity risk can be assessed in many different ways using different liquidity indicators. One of the key liquidity risk monitoring tools is the Bank's survival period, which is based on contractual maturity and behavioural assumptions applied to balance sheet items as well as off-balance-sheet commitments.

Stress Testing

Using various simulations, survival period measures the number of months it would take to completely utilize the Bank's liquid assets if the Bank were to lose deposits prematurely or if funds from wholesale markets were not renewed at maturity. It is measured monthly using three scenarios, which were developed to assess sensitivity to a Bank-specific and/or systemic crisis. Deposit loss simulations are carried out based on their degree of stability, while the value of certain assets is encumbered by an amount reflecting their readiness for liquidation in a crisis. Appropriate scenarios and limits are included in the Bank's *Liquidity, Funding and Pledging Governance Policy*.

The Bank maintains an up-to-date, comprehensive financial contingency and crisis recovery plan that describes the measures to be taken in the event of a critical liquidity situation. This plan is reviewed and approved annually by the Board as part of business continuity and recovery planning. For additional information, see the Regulatory Compliance Risk section of this MD&A.

Liquidity Risk Appetite

The Bank monitors and manages its risk appetite through liquidity limits, ratios, and stress tests. The Bank's liquidity risk appetite is based on the following three principles:

- ensure the Bank has a sufficient amount of unencumbered liquid assets to cover its financial requirements, in both normal and stressed conditions;
- ensure the Bank keeps a liquidity buffer above the minimum regulatory requirement;
- ensure the Bank maintains diversified and stable sources of funding.

Liquid Assets

To protect depositors and creditors from unexpected crisis situations, the Bank holds a portfolio of unencumbered liquid assets that can be readily liquidated to meet financial obligations. The majority of the unencumbered liquid assets are held in Canadian or U.S. dollars. Moreover, all assets that can be quickly monetized are considered liquid assets. The Bank's liquidity reserves do not factor in the availability of the emergency liquidity facilities of central banks. The following tables provide information on the Bank's encumbered and unencumbered assets.

Liquid Asset Portfolio[1]

As at October 31 (millions of Canadian dollars)					2022	2021
	Bank-owned liquid assets[2]	Liquid assets received[3]	Total liquid assets	Encumbered liquid assets[4]	Unencumbered liquid assets	Unencumbered liquid assets
Cash and deposits with financial institutions	31,870	–	31,870	7,690	24,180	27,098
Securities						
Issued or guaranteed by the Canadian government, U.S. Treasury, other U.S. agencies and other foreign governments	38,983	35,996	74,979	49,085	25,894	29,002
Issued or guaranteed by Canadian provincial and municipal governments	13,056	8,864	21,920	13,499	8,421	4,678
Other debt securities	10,399	2,342	12,741	2,932	9,809	7,201
Equity securities	47,281	45,055	92,336	65,045	27,291	26,824
Loans						
Securities backed by insured residential mortgages	11,795	–	11,795	6,213	5,582	3,545
As at October 31, 2022	153,384	92,257	245,641	144,464	101,177	
As at October 31, 2021	149,431	74,070	223,501	125,153		98,348

As at October 31 (millions of Canadian dollars)	2022	2021
Unencumbered liquid assets by entity		
National Bank (parent)	52,544	62,438
Domestic subsidiaries	14,576	12,471
Foreign subsidiaries and branches	34,057	23,439
	101,177	98,348

As at October 31 (millions of Canadian dollars)	2022	2021
Unencumbered liquid assets by currency		
Canadian dollar	49,466	47,293
U.S. dollar	24,871	40,999
Other currencies	26,840	10,056
	101,177	98,348

Liquid Asset Portfolio[1] – Average[5]

Year ended October 31 (millions of Canadian dollars)					2022	2021
	Bank-owned liquid assets[2]	Liquid assets received[3]	Total liquid assets	Encumbered liquid assets[4]	Unencumbered liquid assets	Unencumbered liquid assets
Cash and deposits with financial institutions	39,431	–	39,431	8,062	31,369	32,238
Securities						
Issued or guaranteed by the Canadian government, U.S. Treasury, other U.S. agencies and other foreign governments	33,167	32,546	65,713	42,012	23,701	20,349
Issued or guaranteed by Canadian provincial and municipal governments	13,093	7,283	20,376	14,100	6,276	5,895
Other debt securities	8,772	2,408	11,180	2,409	8,771	6,413
Equity securities	55,020	43,610	98,630	74,203	24,427	34,351
Loans						
Securities backed by insured residential mortgages	10,980	–	10,980	6,762	4,218	3,693
As at October 31, 2022	160,463	85,847	246,310	147,548	98,762	
As at October 31, 2021	161,650	75,626	237,276	134,337		102,939

(1) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.
(2) Bank-owned liquid assets include assets for which there are no legal or geographic restrictions.
(3) Securities received as collateral with respect to securities financing and derivative transactions and securities purchased under reverse repurchase agreements and securities borrowed.
(4) In the normal course of its funding activities, the Bank pledges assets as collateral in accordance with standard terms. Encumbered liquid assets include assets used to cover short sales, obligations related to securities sold under repurchase agreements and securities loaned, guarantees related to security-backed loans and borrowings, collateral related to derivative financial instrument transactions, asset-backed securities, and liquid assets legally restricted from transfers.
(5) The average is based on the sum of the end-of-period balances of the 12 months of the year divided by 12.

Summary of Encumbered and Unencumbered Assets[1]

(millions of Canadian dollars)						As at October 31, 2022
		Encumbered assets[2]		Unencumbered assets	Total	Encumbered assets as % of total assets
	Pledged as collateral	Other[3]	Available as collateral	Other[4]		
Cash and deposits with financial institutions	295	7,395	24,180	–	31,870	1.9
Securities	42,972	–	66,747	–	109,719	10.6
Securities purchased under reverse repurchase agreements and securities borrowed	–	21,818	4,668	–	26,486	5.4
Loans and acceptances, net of allowances	37,426	–	5,582	163,736	206,744	9.3
Derivative financial instruments	–	–	–	18,547	18,547	–
Investments in associates and joint ventures	–	–	–	140	140	–
Premises and equipment	–	–	–	1,397	1,397	–
Goodwill	–	–	–	1,519	1,519	–
Intangible assets	–	–	–	1,360	1,360	–
Other assets	–	–	–	5,958	5,958	–
	80,693	29,213	101,177	192,657	403,740	27.2

(millions of Canadian dollars)						As at October 31, 2021[5]
		Encumbered assets[2]		Unencumbered assets	Total	Encumbered assets as % of total assets
	Pledged as collateral	Other[3]	Available as collateral	Other[4]		
Cash and deposits with financial institutions	275	6,506	27,098	–	33,879	1.9
Securities	38,599	–	67,705	–	106,304	10.9
Securities purchased under reverse repurchase agreements and securities borrowed	–	7,516	–	–	7,516	2.1
Loans and acceptances, net of allowances	37,307	–	3,545	141,837	182,689	10.5
Derivative financial instruments	–	–	–	16,484	16,484	–
Investments in associates and joint ventures	–	–	–	225	225	–
Premises and equipment	–	–	–	1,216	1,216	–
Goodwill	–	–	–	1,504	1,504	–
Intangible assets	–	–	–	1,274	1,274	–
Other assets	–	–	–	4,530	4,530	–
	76,181	14,022	98,348	167,070	355,621	25.4

(1) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.
(2) In the normal course of its funding activities, the Bank pledges assets as collateral in accordance with standard terms. Encumbered assets include assets used to cover short sales, obligations related to securities sold under repurchase agreements and securities loaned, guarantees related to security-backed loans and borrowings, collateral related to derivative financial instrument transactions, asset-backed securities, residential mortgage loans securitized and transferred under the Canada Mortgage Bond program, assets held in consolidated trusts supporting the Bank's funding activities, and mortgage loans transferred under the covered bond program.
(3) Other encumbered assets include assets for which there are restrictions and that cannot therefore be used for collateral or funding purposes as well as assets used to cover short sales.
(4) Other unencumbered assets are assets that cannot be used for collateral or funding purposes in their current form. This category includes assets that are potentially eligible as funding program collateral (e.g., mortgages insured by the Canada Mortgage and Housing Corporation that can be securitized into mortgage-backed securities under the *National Housing Act* (Canada)).
(5) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to the consolidated financial statements.

Liquidity Coverage Ratio

The liquidity coverage ratio (LCR) was introduced primarily to ensure that banks could withstand periods of severe short-term stress. LCR is calculated by dividing the total amount of high-quality liquid assets (HQLA) by the total amount of net cash outflows. OSFI has been requiring Canadian banks to maintain a minimum LCR of 100%. An LCR above 100% ensures that banks are holding sufficient high-quality liquid assets to cover net cash outflows given a severe, 30-day liquidity crisis. The assumptions underlying the LCR scenario were established by the BCBS and OSFI's *Liquidity Adequacy Requirements Guideline*.

The following table provides average LCR data calculated using the daily figures in the quarter. For the quarter ended October 31, 2022, the Bank's average LCR was 140%, well above the 100% regulatory requirement and demonstrating the Bank's solid liquidity position.

LCR Disclosure Requirements[1][2]

(millions of Canadian dollars)			For the quarter ended
	October 31, 2022		July 31, 2022
	Total unweighted value[3] (average)	Total weighted value[4] (average)	Total weighted value[4] (average)
High-quality liquid assets (HQLA)			
Total HQLA	n.a.	76,469	71,388
Cash outflows			
Retail deposits and deposits from small business customers, of which:	67,086	6,953	5,281
Stable deposits	28,709	861	876
Less stable deposits[5]	38,377	6,092	4,405
Unsecured wholesale funding, of which:	102,020	55,770	56,563
Operational deposits[5] (all counterparties) and deposits in networks of cooperative banks	27,635	6,738	5,715
Non-operational deposits (all counterparties)	62,319	36,966	39,620
Unsecured debt	12,066	12,066	11,228
Secured wholesale funding	n.a.	20,465	15,955
Additional requirements, of which:	53,259	14,231	12,559
Outflows related to derivative exposures and other collateral requirements	15,872	7,381	5,718
Outflows related to loss of funding on secured debt securities	1,580	1,580	1,864
Backstop liquidity and credit enhancement facilities and commitments to extend credit	35,807	5,270	4,977
Other contractual commitments to extend credit	1,830	1,040	758
Other contingent commitments to extend credit	121,558	1,788	1,771
Total cash outflows	n.a.	100,247	92,887
Cash inflows			
Secured lending (e.g., reverse repos)	106,713	22,562	20,976
Inflows from fully performing exposures	10,737	6,673	5,910
Other cash inflows	15,966	15,966	17,496
Total cash inflows	133,416	45,201	44,382
		Total adjusted value[6]	Total adjusted value[6]
Total HQLA		76,469	71,388
Total net cash outflows		55,046	48,505
Liquidity coverage ratio (%)[7]		140 %	148 %

n.a. Not applicable
(1) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.
(2) OSFI prescribed a table format in order to standardize disclosure throughout the banking industry.
(3) Unweighted values are calculated as outstanding balances maturing or callable within 30 days (for inflows and outflows).
(4) Weighted values are calculated after the application of respective haircuts (for HQLA) or inflow and outflow rates.
(5) During the quarter ended October 31, 2022, the Bank refined its method for classifying less stable retail deposits and deposits from small business customers as well as unsecured wholesale funding operational deposits.
(6) Total adjusted values are calculated after the application of both haircuts and inflow and outflow rates and any applicable caps.
(7) The data in this table has been calculated using averages of the daily figures in the quarter.

As at October 31, 2022, Level 1 liquid assets represented 84% of the Bank's HQLA, which includes cash, central bank deposits, and bonds issued or guaranteed by the Canadian government and Canadian provincial governments. Cash outflows arise from the application of OSFI-prescribed assumptions on deposits, debt, secured funding, commitments and additional collateral requirements. The cash outflows are partly offset by cash inflows, which come mainly from secured loans and performing loans. The Bank expects some quarter-over-quarter variation between reported LCRs without such variation being necessarily indicative of a trend. The variation between the quarter ended October 31, 2022 and the preceding quarter is a result of normal business operations. The Bank's liquid asset buffer is well in excess of its total net cash outflows. The LCR assumptions differ from the assumptions used for the liquidity disclosures presented in the tables on the previous pages or those used for internal liquidity management rules. While the liquidity disclosure framework is prescribed by the EDTF, the Bank's internal liquidity metrics use assumptions that are calibrated according to its business model and experience.

Intraday Liquidity

The Bank manages its intraday liquidity in such a way that the amount of available liquidity exceeds its maximum intraday liquidity requirements. The Bank monitors its intraday liquidity on an hourly basis, and the evolution thereof is presented monthly to the Financial Markets Risk Committee.

Net Stable Funding Ratio

The BCBS has developed the Net Stable Funding Ratio (NSFR) to promote a more resilient banking sector. The NSFR requires institutions to maintain a stable funding profile in relation to the composition of their assets and off-balance-sheet activities. A viable funding structure is intended to reduce the likelihood that disruptions to an institution's regular sources of funding would erode its liquidity position in a way that would increase the risk of its failure and potentially lead to broader systemic stress. NSFR is calculated by dividing available stable funding by required stable funding. OSFI has been requiring Canadian banks to maintain a minimum NSFR of 100%.

The following table provides the available stable funding and the required stable funding in accordance with OSFI's *Liquidity Adequacy Requirements Guideline*. As at October 31, 2022, the Bank's NSFR was 117%, well above the 100% regulatory requirement and demonstrating the Bank's solid liquidity in a long-term position.

NSFR Disclosure Requirements[1][2]

(millions of Canadian dollars)					As at October 31, 2022	As at July 31, 2022
	Unweighted value by residual maturity					
	No maturity	6 months or less	Over 6 months to 1 year	Over 1 year	Weighted value[3]	Weighted value[3]
Available Stable Funding (ASF) Items						
Capital:	21,746	–	–	1,499	23,245	22,607
Regulatory capital	21,746	–	–	1,499	23,245	22,607
Other capital instruments	–	–	–	–	–	–
Retail deposits and deposits from small business customers:	63,232	11,080	9,025	17,447	90,866	83,433
Stable deposits	26,500	3,102	4,065	5,866	37,850	37,750
Less stable deposits[4]	36,732	7,978	4,960	11,581	53,016	45,683
Wholesale funding:	62,829	85,492	10,832	37,405	91,959	96,027
Operational deposits[4]	31,076	–	–	–	15,538	10,600
Other wholesale funding	31,753	85,492	10,832	37,405	76,421	85,427
Liabilities with matching interdependent assets[5]	–	3,271	3,553	19,453	–	–
Other liabilities[6]:	25,445		21,711		710	704
NSFR derivative liabilities[6]	n.a.		19,055		n.a.	n.a.
All other liabilities and equity not included in the above categories	25,445	1,820	253	583	710	704
Total ASF	n.a.	n.a.	n.a.	n.a.	206,780	202,771
Required Stable Funding (RSF) Items						
Total NSFR high-quality liquid assets (HQLA)	n.a.	n.a.	n.a.	n.a.	8,845	7,235
Deposits held at other financial institutions for operational purposes	–	–	–	–	–	–
Performing loans and securities:	58,799	61,316	22,183	98,980	145,555	140,975
Performing loans to financial institutions secured by Level 1 HQLA	2,595	3,932	–	9	343	83
Performing loans to financial institutions secured by non-Level 1 HQLA and unsecured performing loans to financial institutions	8,325	22,222	1,650	365	5,426	5,383
Performing loans to non-financial corporate clients, loans to retail and small business customers, and loans to sovereigns, central banks and public sector entities, of which:	25,149	27,048	13,868	36,478	70,494	67,324
With a risk weight of less than or equal to 35% under the Basel II Standardized Approach for credit risk	816	2,867	431	279	2,360	1,965
Performing residential mortgages, of which:	9,624	5,166	5,928	57,933	52,743	52,236
With a risk weight of less than or equal to 35% under the Basel II Standardized Approach for credit risk	9,624	5,166	5,928	57,933	52,743	52,236
Securities that are not in default and do not qualify as HQLA, including exchange-traded equities	13,106	2,948	737	4,195	16,549	15,949
Assets with matching interdependent liabilities[5]	–	3,271	3,553	19,453	–	–
Other assets[6]:	3,810		58,136		18,455	18,428
Physical traded commodities, including gold	294	n.a.	n.a.	n.a.	294	292
Assets posted as initial margin for derivative contracts and contributions to default funds of central counterparties[5]	n.a.		8,413		7,151	7,581
NSFR derivative assets[6]	n.a.		16,985		–	–
NSFR derivative liabilities before deduction of the variation margin posted[6]	n.a.		25,686		1,284	949
All other assets not included in the above categories	3,516	5,733	645	674	9,726	9,606
Off-balance-sheet items[6]	n.a.		101,010		3,787	3,677
Total RSF	n.a.	n.a.	n.a.	n.a.	176,642	170,315
Net Stable Funding Ratio (%)	n.a.	n.a.	n.a.	n.a.	117 %	119 %

n.a. Not applicable
(1) See the Financial Reporting Method section on pages 16 to 21 for additional information on capital management measures.
(2) OSFI prescribed a table format in order to standardize disclosure throughout the banking industry.
(3) Weighted values are calculated after application of the weightings set out in OSFI's *Liquidity Adequacy Requirements Guideline*.
(4) During the quarter ended October 31, 2022, the Bank refined its method for classifying less stable retail deposits and deposits from small business customers as well as wholesale funding operational deposits.
(5) As per OSFI's specifications, liabilities arising from transactions involving the Canada Mortgage Bond program and their corresponding encumbered mortgages are given ASF and RSF weights of 0%, respectively.
(6) As per OSFI's specifications, there is no need to differentiate by maturity.

The NSFR represents the amount of ASF relative to the amount of RSF. ASF is defined as the portion of capital and liabilities expected to be reliable over the time horizon considered by the NSFR, which extends to one year. The amount of RSF of a specific institution is a function of the liquidity characteristics and residual maturities of the various assets held by that institution as well as those of its off-balance-sheet exposures. The amounts of ASF and RSF are calibrated to reflect the degree of stability of liabilities and liquidity of assets. The Bank expects some quarter-over-quarter variation between reported NSFRs without such variation being necessarily indicative of a trend.

The NSFR assumptions differ from the assumptions used for the liquidity disclosures provided in the tables on the preceding pages or those used for internal liquidity management rules. While the liquidity disclosure framework is prescribed by the EDTF, the Bank's internal liquidity metrics use assumptions that are calibrated according to its business model and experience.

Funding Risk

Funding risk is defined as the risk to the Bank's ongoing ability to raise sufficient funds to finance actual or proposed business activities on an unsecured or secured basis at an acceptable price. The Bank maintains a good balance of its funding through appropriate diversification of its unsecured funding vehicles, securitization programs, and secured funding. The Bank also diversifies its funding by currency, geography, and maturity. The funding management priority is to achieve an optimal balance between deposits, securitization, secured funding, and unsecured funding. This brings optimal stability to the funding and reduces vulnerability to unpredictable events.

Liquidity and funding levels remained sound and robust over the year, and the Bank does not foresee any event, commitment, or demand that might have a significant impact on its liquidity and funding risk position. For additional information, see the table entitled Residual Contractual Maturities of Balance Sheet Items and Off-Balance-Sheet Commitments in Note 29 to the consolidated financial statements.

Credit Ratings

The credit ratings assigned by ratings agencies represent their assessment of the Bank's credit quality based on qualitative and quantitative information provided to them. Credit ratings may be revised at any time based on various factors, including macroeconomic factors, the methodologies used by ratings agencies, or the current and projected financial condition of the Bank. Credit ratings are one of the main factors that influence the Bank's ability to access financial markets at a reasonable cost. A downgrade in the Bank's credit ratings could adversely affect the cost, size, and term of future funding and could also result in increased requirement to pledge collateral or decreased capacity to engage in certain collateralized business activities at a reasonable cost, including hedging and derivative transactions.

Liquidity and funding levels remain sound and robust, and the Bank continues to enjoy excellent access to the market for its funding needs. The Bank received favourable credit ratings from all the agencies, reflecting the high quality of its debt instruments, and the Bank's objective is to maintain these strong credit ratings. On April 29, 2022, DBRS Morningstar (DBRS) raised the ratings of the Bank and its related entities, including the rating for long-term deposits and for long-term non-bail-inable senior debt to AA from AA(low), and it raised the rating for short-term senior debt to R-1(high) from R-1(mid). In addition, DBRS changed the trends of all the ratings to "Stable" from "Positive". This change reflects DBRS's recognition of the Bank's solid performance in recent years. For Moody's, S&P, and Fitch, the outlook remains unchanged at "Stable." The following table presents the Bank's credit ratings according to four rating agencies as at October 31, 2022.

The Bank's Credit Ratings

As at October 31, 2022

	Moody's	S&P	DBRS	Fitch
Short-term senior debt	P-1	A-1	R-1 (high)	F1+
Canadian commercial paper		A-1 (mid)		
Long-term deposits	Aa3		AA	AA-
Long-term non-bail-inable senior debt[1]	Aa3	A	AA	AA-
Long term senior debt[2]	A3	BBB+	AA (low)	A+
NVCC subordinated debt	Baa2 (hyb)	BBB	A (low)	
NVCC limited recourse capital notes	Ba1 (hyb)	BB+	BBB (high)	
NVCC preferred shares	Ba1 (hyb)	P-3 (high)	Pfd-2	
Counterparty risk[3]	Aa3/P-1			AA-
Covered bonds program	Aaa		AAA	AAA
Rating outlook	Stable	Stable	Stable	Stable

(1) Includes senior debt issued before September 23, 2018 and senior debt issued on or after September 23, 2018, which is excluded from the Bank Recapitalization (Bail-In) Regime.
(2) Subject to conversion under the Bank Recapitalization (Bail-In) Regime.
(3) Moody's uses the term Counterparty Risk Rating while Fitch uses the term Derivative Counterparty Rating.

Guarantees
As part of a comprehensive liquidity management framework, the Bank regularly reviews its contracts that stipulate that additional collateral could be required in the event of a downgrade of the Bank's credit rating. The Bank's liquidity position management approach already incorporates additional collateral requirements in the event of a one-notch to three-notch downgrade. These additional collateral requirements are presented in the table below.

(millions of Canadian dollars)		As at October 31, 2022
	One-notch downgrade	Three-notch downgrade
Derivatives(1)	30	98

(1) Contractual requirements related to agreements known as Credit Support Annexes.

Funding Strategy
The main objective of the funding strategy is to support the Bank's organic growth while also enabling it to survive potentially severe and prolonged crises and to meet its regulatory obligations and financial targets.

The Bank's funding framework is summarized as follows:

- pursue a diversified deposit strategy to fund core banking activities through stable deposits coming from the networks of each of the Bank's major business segments;
- maintain sound liquidity risk management through centralized expertise and management of liquidity metrics within a predefined risk appetite;
- maintain active access to various markets to ensure a diversification of institutional funding in terms of source, geographic location, currency, instrument, and maturity, whether or not funding is secured.

The funding strategy is implemented in support of the Bank's overall objectives of strengthening its franchise among market participants and reinforcing its excellent reputation. The Bank continuously monitors and analyzes market trends as well as possibilities for accessing less expensive and more flexible funding, considering both the risks and opportunities observed. The deposit strategy remains a priority for the Bank, which continues to prefer deposits to institutional funding.

The Bank actively monitors and controls liquidity risk exposures and funding needs within and across entities, business segments, and currencies. The process involves evaluating the liquidity position of individual business segments in addition to that of the Bank as a whole as well as the liquidity risk from raising unsecured and secured funding in foreign currencies. The funding strategy is implemented through the funding plan and deposit strategy, which are monitored, updated to reflect actual results, and regularly evaluated.

Diversified Funding Sources
The primary purpose of diversifying by source, geographic location, currency, instrument, maturity, and depositor is to mitigate liquidity and funding risk by ensuring that the Bank maintains alternative sources of funds that strengthen its capacity to withstand a variety of severe yet plausible institution-specific and market-wide shocks. To meet this objective, the Bank:

- takes funding diversification into account in the business planning process;
- maintains a variety of funding programs to access different markets;
- sets limits on funding concentration;
- maintains strong relationships with fund providers;
- is active in various funding markets of all tenors and for various instruments;
- identifies and monitors the main factors that affect the ability to raise funds.

The Bank is active in the following funding and securitization platforms:

- Canadian dollar Senior Unsecured Debt;
- U.S. dollar Senior Unsecured Debt programs;
- Canadian Medium-Term Note Shelf;
- U.S. dollar Commercial Paper programs;
- U.S. dollar Certificates of Deposit;
- Euro Medium-Term Note program;
- Canada Mortgage and Housing Corporation securitization programs;
- Canadian Credit Card Trust II;
- Legislative Covered Bond program.

The table below presents the residual contractual maturities of the Bank's wholesale funding. The information has been presented in accordance with the categories recommended by the EDTF for comparison purposes with other banks.

Residual Contractual Maturities of Wholesale Funding[1]

(millions of Canadian dollars)								As at October 31, 2022
	1 month or less	Over 1 month to 3 months	Over 3 months to 6 months	Over 6 months to 12 months	Subtotal 1 year or less	Over 1 year to 2 years	Over 2 years	Total
Deposits from banks[2]	484	–	–	–	484	–	–	484
Certificates of deposit and commercial paper[3]	5,560	4,230	4,788	793	15,371	–	–	15,371
Senior unsecured medium-term notes[4][5]	78	1,348	3,000	587	5,013	3,771	6,423	15,207
Senior unsecured structured notes	–	140	183	70	393	–	2,387	2,780
Covered bonds and asset-backed securities								
Mortgage securitization	–	2,672	422	3,617	6,711	4,558	15,008	26,277
Covered bonds	–	–	–	2,017	2,017	1,009	7,386	10,412
Securitization of credit card receivables	–	–	–	29	29	–	49	78
Subordinated liabilities[6]	–	–	–	–	–	–	1,499	1,499
	6,122	8,390	8,393	7,113	30,018	9,338	32,752	72,108
Secured funding	–	2,672	422	5,663	8,757	5,567	22,443	36,767
Unsecured funding	6,122	5,718	7,971	1,450	21,261	3,771	10,309	35,341
	6,122	8,390	8,393	7,113	30,018	9,338	32,752	72,108
As at October 31, 2021	2,643	8,872	9,802	7,390	28,707	10,400	29,331	68,438

(1) Bankers' acceptances are not included in this table.
(2) Deposits from banks include all non-negotiable term deposits from banks.
(3) Includes bearer deposit notes.
(4) Certificates of deposit denominated in euros are included in senior unsecured medium-term notes.
(5) Includes deposits subject to bank recapitalization (Bail-In) conversion regulations.
(6) Subordinated debt is presented in this table, but the Bank does not consider it as part of its wholesale funding.

Operational Risk

Operational risk is the risk of loss resulting from an inadequacy or a failure ascribable to human resources, equipment, processes, technology, or external events. Operational risk exists for every Bank activity. Theft, fraud, cyberattacks, unauthorized transactions, system errors, human error, amendments to or misinterpretation of laws and regulations, litigation or disputes with clients, inappropriate sales practice behaviour, or property damage are just a few examples of events likely to cause financial loss, harm the Bank's reputation, or lead to regulatory penalties or sanctions.

Although operational risk cannot be eliminated entirely, it can be managed in a thorough and transparent manner to keep it at an acceptable level. The Bank's operational risk management framework is built on the concept of three lines of defence and provides a clear allocation of responsibilities to all levels of the organization, as mentioned below.

Operational Risk Management Framework

The operational risk management framework is described in the Operational Risk Management Policy, which is derived from the Risk Management Policy. The operational risk management framework is aligned with the Bank's risk appetite and is made up of policies, standards, and procedures specific to each operational risk, which fall under the responsibility of specialized groups.

The Operational Risk Management Committee (ORMC), a subcommittee of the GRC, is the main governance committee overseeing operational risk matters. Its mission is to provide oversight of the operational risk level across the organization to ensure it aligns with the Bank's risk appetite targets. It implements effective frameworks for managing operational risk, including policies and standards, and monitors the application thereof.

The segments use several operational risk management tools and methods to identify, assess, and manage their operational risks and control measures. With these tools and methods, the segments can:

- recognize and understand the inherent and residual risks to which their activities and operations are exposed;
- identify how to manage and monitor the identified risks to keep them at an acceptable level;
- proactively and continuously manage risks.

Operational Risk Management Tools and Methods

Collection and Analysis of Data on Operational Events

The Operational Risk Unit applies a process, across the Bank and its subsidiaries, for identifying, collecting, and analyzing data on internal operational events. This process helps determine the Bank's exposure to the operational risks and operational losses incurred and assess the effectiveness of internal controls. It also helps limit operational events, keep losses at an acceptable level and, as a result, reduce potential capital charges and lower the likelihood of damage to the Bank's reputation. These data are processed and saved in a centralized database and are periodically the subject of a quality assurance exercise.

Analysis and Lessons Learned From Operational Incidents Observed in Other Large Businesses

By collecting and analyzing media-reported information about significant operational incidents, in particular incidents related to fraud, information security, and theft of personal information experienced by other organizations, the Bank can assess the effectiveness of its own operational risk management practices and reinforce them, if necessary.

Operational Risk Self-Assessment Program

The operational risk self-assessment program gives each business unit and corporate unit the means to proactively identify and assess the new or major operational risks to which they are exposed, evaluate the effectiveness of mitigating controls, and develop action plans to keep such risks at acceptable levels. As such, the program helps in anticipating factors that could hinder performance or the achievement of objectives.

Key Risk Indicators

Key risk indicators are used to monitor the main operational risk exposure factors and track how risks are evolving in order to proactively manage them. The business units and corporate units define the key indicators associated with their main operational risks and assign tolerance thresholds to them. These indicators are monitored periodically and, when they show a significant increase in risk or when a tolerance threshold is exceeded, they are sent to an appropriate level in the hierarchy and action plans are implemented as required.

Scenario Analysis

Scenario analysis, which is part of a Bank-wide stress testing program, is an important and useful tool for assessing the impacts related to potentially serious events. It is used to define the risk appetite, set risk exposure limits, and engage in business planning. More specifically, scenario analysis provides management with a better understanding of the risks faced by the Bank and helps it make appropriate management decisions to mitigate potential operational risks that are inconsistent with the Bank's risk appetite.

Insurance Program

To protect itself against any material losses arising from unforeseeable operational risk exposure, the Bank also has adequate insurance, the nature and amount of which meet its coverage requirements.

Operational Risk Reports and Disclosures

Operational events for which the financial impact exceeds tolerance thresholds or that have a significant regulatory or reputation impact are submitted to appropriate decision-making levels. Management is obligated to report on its management process and to remain alert to current and future issues. Reports on the Bank's risk profile, highlights, and emerging risks are periodically submitted, on a timely basis, to the ORMC, the GRC, and the RMC. This reporting enhances the transparency and proactive management of the main operational risk factors.

Regulatory Compliance Risk

Regulatory compliance risk is the risk of the Bank or of one of its employees or business partners failing to comply with the regulatory requirements in effect where it does business, both in Canada and internationally. Regulatory compliance risk is present in all of the daily operations of each Bank segment. A situation of regulatory non-compliance can adversely affect the Bank's reputation and result in penalties and sanctions or increased oversight by regulators.

Organizational Structure of Compliance

Compliance is an independent oversight function within the Bank. The Senior Vice-President, Chief Compliance Officer and Chief Anti-Money Laundering Officer serves as both chief compliance officer (CCO) and chief anti-money laundering officer (CAMLO) for the Bank and its subsidiaries and foreign centres. She is responsible for implementing and updating the Bank's programs for regulatory compliance management, regulatory requirements related to AML/ATF, international sanctions, and the fight against corruption. The CCO and CAMLO has a direct relationship with the Chair of the RMC and meets with him at least once every quarter. She can also communicate directly with senior management, officers, and directors of the Bank and of its subsidiaries and foreign centres.

Regulatory Compliance Framework
The Bank operates in a highly regulated industry. To ensure sound management of regulatory compliance, the Bank favours proactive approaches and incorporates regulatory requirements into its day-to-day operations.

Such proactive management also provides reasonable assurance that the Bank is in compliance, in all material respects, with the regulatory requirements in effect where it does business, both in Canada and internationally.

The implementation of a regulatory compliance risk management framework across the Bank is entrusted to the Compliance Service, which has the following mandate:

- implement policies and standards that ensure compliance with current regulatory requirements, including those related to AML/ATF, to international sanctions, and to the fight against corruption;
- develop compliance and AML/ATF training programs for Bank employees, officers, and directors;
- exercise independent oversight and monitoring of the programs, policies, and procedures implemented by the management of the Bank, its subsidiaries, and its foreign centres to ensure that the control mechanisms are sufficient, respected, and effective;
- report relevant compliance and AML/ATF matters to the Bank's Board and inform it of any significant changes in the effectiveness of the risk management framework.

The Bank holds itself to high regulatory compliance risk management standards in order to earn the trust of its clients, its shareholders, the market, and the general public.

Described below are the main regulatory developments that have been monitored over the past year.

Reform of the *Official Languages Act* (federal law)
Bill C-13, *An Act to amend the Official Languages Act, to enact the Use of French in Federally Regulated Private Businesses Act and to make related amendments to other Acts,* proposes to modernize the *Official Languages Act* by granting new powers to the Commissioner of Official Languages (entering into compliance agreements, issuing orders, and imposing penalties). The bill also proposes enactment of a new act, namely, the *Use of French in Federally Regulated Private Businesses Act*, which addresses the language of service for consumers and the language of work in Quebec and in regions with a strong francophone presence.

Bill 96: *An Act respecting French, the official and common language of Quebec* (Quebec law)
Bill 96 makes amendments to the *Charter of the French Language* and other laws. The objectives are to strengthen the presence and use of the French language in Quebec, to establish a new *Charter of the French Language,* and to affirm that French is the only official language of Quebec. Key aspects of Bill 96 notably include francization committees, work and employment rights, contracts and consumer rights, litigation and the publication of rights, and public signs and commercial advertising. Bill 96 was assented to on June 1, 2022.

Bill 18 – Protection of Vulnerable Persons
Bill 18, *An Act to amend the Civil Code, the Code of Civil Procedure, the Public Curator Act and various provisions as regards the protection of persons,* has abolished curatorships and adviserships to persons of full age. Tutorships to persons of full age will remain in place, but it will be possible to modulate them based on the incapacity level of the person of full age. The new law will create temporary representation of persons of full age and assistants to persons of full age. The effective date, initially expected in June, was postponed to November 2022.

Consumer Protection (*Bank Act*)
A new *Financial Consumer Protection Framework* (C-86) took effect on June 30, 2022. It modernized certain provisions of the *Bank Act* and related regulations in order to strengthen consumer protections, notably through additional communications to customers, assessments of product and service appropriateness, employee training, reporting of wrongdoings (whistleblowing), and complaint handling processes.

Bill C-30 Addressing Unclaimed Bank Balances, Among Other Matters
Bill C-30 makes an amendment to the *Bank Act*. Unclaimed balances refer in particular to a deposit in an inactive bank account and will now include deposits and instruments in foreign currencies. This plan requires financial institutions to send letters to clients to inform them of the existence of unclaimed balances. An electronic notice must also be sent when the financial institution possesses the electronic contact information of the clients. Additional information regarding clients who have an unclaimed balance will also have to be sent to the Bank of Canada. The effective date of the bill is anticipated to be June 30, 2023.

Anti-Money Laundering and Anti-Terrorist Financing (AML/ATF) Activities
Amendments made to the regulations set out in the *Proceeds of Crime (Money Laundering) and Terrorist Financing Act* took effect on June 1, 2021. The new reporting requirements are expected to take effect in 2023-2024 such that the Financial Transactions and Reports Analysis Centre of Canada (FINTRAC) can prepare the new reporting forms.

Protection of Personal Information

Given changing technologies and societal behaviours, privacy and the protection of personal information is a topical issue in Canada. Recent regulatory measures (such as the *General Data Protection Regulation* (GDPR) in Europe in 2018 and the *California Consumer Privacy Act* in the United States in 2020) reflect a desire to implement a stronger legislative framework in the areas of confidentiality and use of personal information. In Quebec, in September 2021, the government adopted Bill 64, *An Act to modernize legislative provisions as regards the protection of personal information*, which has introduced substantial changes regarding the protection of personal information. Essentially, the Act promotes transparency, raises the confidentiality level of data, and provides a framework for the collection, use, and sharing of personal information. At the federal level, Bill C-27, tabled in June 2022, enacts three new laws: the *Consumer Privacy Protection Act*, the *Personal Information and Data Protection Tribunal Act*, the *Artificial Intelligence and Data Act*. The latter act is the first bill designed to regulate artificial intelligence in Canada. Members of industry, regulatory agencies, and consumer advocates were consulted to help design and establish the pillars of an open banking system, which enable consumers to transfer their financial data between financial institutions and accredited third parties in a secure and user-friendly manner.

Canada Deposit Insurance Corporation (CDIC)

On April 30, 2022, separate coverage for registered education savings plans and registered disability savings plans was granted as part of changes to the *Canada Deposit Insurance Corporation Act*. New requirements were established for the coverage of deposits in trust, particularly nominee-brokered deposits and those of professional trustees.

Recovery and Resolution Planning

As part of the regulatory measures used to manage systemic risks, D-SIBs are required to prepare recovery and resolution plans. A recovery plan is essentially a roadmap that guides the recovery of a bank in the event of severe financial stress; conversely, a resolution plan guides its orderly wind-down in the event of failure when recovery is no longer an option. The Bank improves and periodically updates its recovery and resolution plans to prepare for these high-risk, but low-probability, events. In addition, the Bank and other D-SIBs continue to work with the CDIC to maintain a comprehensive settlement plan that would ensure an orderly winding down of the Bank's operations. These plans are approved by the Board and submitted to the national regulatory agencies.

Section 871(m) – Dividend Equivalent Payments

Section 871(m) of the U.S. *Internal Revenue Code* (IRC) aims to ensure that non-U.S. persons pay tax on payments that can be considered dividends on U.S. shares, when these payments are made on certain derivative instruments. The derivative instruments for which the underlyings are U.S. shares (including U.S. exchange-traded funds) or "non-qualified indices" concluded as of January 1, 2017 are subject to the withholding and reporting requirements. The effective date for certain components of this regulation has been deferred to January 1, 2023. Some of the obligations of a qualified derivatives dealer, established under section 871(m) of the IRC and the qualified intermediary agreement, have also been deferred to January 1, 2023. However, the U.S. Internal Revenue Service has informed market participants that it is working on a new notice that would again postpone these obligations beyond 2023.

Foreign Account Tax Compliance Act and the Common Reporting Standard

The U.S. law addressing foreign account tax compliance (*Foreign Account Tax Compliance Act* or FATCA), and the *Common Reporting Standard* (CRS), an international standard, the principles of which have been incorporated into the *Income Tax Act* (Canada), are intended to counter tax evasion by taxpayers through the international exchange of tax information through financial institutions. On March 10, 2022, clarifications were provided on the application of some of the guidelines in these regulations.

Client-Centred Reforms – Amendments to *Regulation 31-103*

Pursuant to *Regulation 31-103 respecting Registration Requirements*, *Exemptions and Ongoing Registrant obligations*, regulatory changes were made to the process for declaring conflicts of interest and external activities and to the following topics: KYC (know-your-client) and KYP (know-your-product), suitability determination, misleading communications, relationship disclosure, and training. The Bank is ensuring that it is compliant with these changes as they are published.

Reform of Interest Rate Benchmarks

The reform of interest rate benchmarks is a global initiative that is being coordinated and led by central banks and governments around the world, including Canada. The objective is to improve benchmarks by ensuring that they meet robust international standards. LIBOR (London Interbank Offered Rates) in particular is in the process of being discontinued, and risk-free rates such as SOFR (Secured Overnight Financing Rate), ESTR (Euro Short-Term Rate), SONIA (Sterling Over Night Index Average), SARON (Swiss Average Rate Overnight), and TONAR (Tokyo Overnight Average Rate) are recommended as replacements for LIBOR. On December 31, 2021, all LIBOR rates in European, British, Swiss, and Japanese currency as well as the one-week and two-month USD LIBOR rates were discontinued, whereas the other USD LIBOR rates will be discontinued after June 30, 2023. In Canada, publication of the CDOR (Canadian Dollar Offered Rate) will be discontinued on June 28, 2024 and be replaced by the risk-free rate CORRA (Canadian Overnight Repo Rate Average). For additional information, see the Basis of Presentation section in Note 1 to the consolidated financial statements.

One-Day Settlement Cycle
In February 2022, the CSA staff published a notice to inform Canadian securities stakeholders about an initiative to shorten the standard settlement cycle for most trades in securities from two days to one day. This notice follows a report published in the U.S. securities sector indicating that it has set March 31, 2024 as the date for transitioning the standard settlement cycle in the U.S. to one day from the current settlement time of two days. Aligning the Canadian and U.S. settlement cycles is critical so as to avoid inefficiencies and prevent any prejudicial impact on Canadian investors and capital markets. The move towards a shortened settlement cycle will result in changes to systems, regulations, and procedures.

New Self-Regulatory Organization (SRO)
The CSA will create a new self-regulatory organization that will, among other things, combine the functions of the Investment Industry Regulatory Organization of Canada and the Mutual Fund Dealers Association of Canada. This new organization is expected to be operational by the end of 2022. A working committee was created to assess the potential impacts and benefits of this new structure for Wealth Management and the National Bank Investments subsidiary.

Reputation Risk

Reputation risk is the risk that the Bank's operations or practices will be judged negatively by the public, whether that judgment is with or without basis, thereby adversely affecting the perception, image, or trademarks of the Bank and potentially resulting in costly litigation or loss of income. Reputation risk generally arises from a deficiency in managing another risk. The Bank's reputation may, for example, be adversely affected by non-compliance with laws and regulations or by process failures. All risks must therefore be managed effectively in order to protect the Bank's reputation.

The Bank's corporate culture continually promotes the behaviours and values to be adopted by employees. It creates an awareness among all employees about the potential consequences of their actions on the Bank's reputation and brand. In addition to the above-mentioned operational risk management initiatives, the Bank uses a variety of mechanisms to support sound management of reputation risk. Our *Code of Conduct* outlines what is expected from each employee in terms of ethical behaviour and rules to be followed as they carry out their duties. Also supporting our corporate culture are policies specifically addressing ethics and corporate governance as well as appropriate training programs. The Bank also has a crisis management framework featuring effective intervention, communication, and behavioural parameters that help to minimize any impact on business activities, clients, and employees.

The Bank also has a reputation risk policy, approved by the RMC, that covers all of the Bank's practices and activities. The policy sets the reputation risk management principles and rules for clients, employees, and communities, all of which are stakeholders of the Bank. The policy is complemented by the special provisions of the new products and activities policy, which determines the approvals required by the various committees that assess risk whenever new products or activities are introduced within the business units. These provisions are intended, among other things, to provide oversight for the management of reputation risk, which may be material for such products or activities. The new products and activities policy requires that any new product or activity for which reputation risk is determined to be high be submitted to the GRC for approval. The activities of the Compliance Service, Legal Affairs Department, Communications and Corporate Social Responsibility Department and Investor Relations Department complete the reputation risk management framework.

Strategic Risk

Strategic risk is the risk of a financial loss or of reputational harm arising from inappropriate strategic orientations, improper execution, or ineffective response to economic, financial, or regulatory changes. The corporate strategic plan is developed by the Senior Leadership Team, in alignment with the Bank's overall risk appetite, and approved by the Board. Once approved, the initiatives of the strategic plan are monitored regularly to ensure that they are progressing. If not, strategies could be reviewed or adjusted if deemed appropriate.

In addition, the Bank has a specific Board-approved policy for strategic investments, which are defined as purchases of business assets or acquisitions of significant interests in an entity for the purposes of acquiring control or creating a long-term relationship. As such, acquisition projects and other strategic investments are analyzed through a due diligence process to ensure that these investments are aligned with the corporate strategic plan and the Bank's risk appetite.

Environmental and Social Risk

Environmental and social risk is the possibility that environmental and social matters would result in a financial loss for the Bank or affect its business activities. The Bank is directly exposed to such risk through its own activities and indirectly exposed through the activities of its clients. This risk encompasses many topics, in particular pollution and waste; the use of energy, water, and other resources; climate change; biodiversity; human rights; inclusion, diversity and equity; labour standards and human capital management practices; community health; occupational health and safety; the rights of Indigenous Peoples and consultation thereof; as well as cultural heritage. The impact of environmental and social risk could also increase exposure to strategic, reputation, and regulatory compliance risks if the Bank's response is deemed inadequate or non-compliant with commitments. As such, it is possible that the Bank's predictions, targets, projections, expectations or conclusions prove to be inaccurate, that its assumptions may not be confirmed, and that its strategic objectives and performance targets will not be achieved.

Assessing and mitigating environmental and social risk are integral parts of the Bank's risk management framework. Environmental and social issues are now central to the Bank's decision-making process and are becoming increasingly imperative to the Bank. Addressing such risk may even prove to be a considerable asset in certain financing or investment transactions, and doing so also contributes to promoting exemplary practices to the Bank's stakeholders.

The Bank has adopted environmental, social, and governance (ESG) principles that show the importance it attaches to sustainable development and to balancing the interests of societal stakeholders. These ESG principles have been incorporated into the organization's priorities, and ESG indicators have been added to various monitoring dashboards and are gradually being integrated into the Bank's risk appetite framework. Reports on these indicators and on the Bank's ESG commitments are being periodically presented to various internal committees and to Board committees. In addition, the Bank's *Code of Conduct* outlines what is expected from each employee in their professional, business, and community interactions. It also provides guidance on adhering to the Bank's values, on the day-to-day conduct of the Bank's affairs, and on relationships with third parties, employees, and clients to create an environment conducive to achieving the Bank's One Mission, namely, to have a positive impact on people's lives.

The Bank has also implemented an environmental policy that applies to all activities and decisions made across the Bank. This policy clearly sets out principles for identifying and limiting environmental risk and climate risk as well as the impacts therefrom on the community and on the Bank's business segments. The Bank is pursuing its commitment to carbon neutrality by reducing the carbon footprint of its own activities and by offsetting its greenhouse gas (GHG) emissions through various organizations. The Bank is also prioritizing energy efficiency and has demonstrated leadership in this regard by deploying an innovative system that lets it regulate the energy consumption of 260 branches using building control systems and a web interface. In addition, responsible procurement criteria have been incorporated into the purchasing and supplier selection practices for the construction of the Bank's new head office building. The new head office is, in fact, aiming to achieve LEED v4[(1)] Gold certification in addition to WELL[(2)] certification. Furthermore, we are continuing to work on the implementation of a global responsible procurement strategy.

ESG factors continue to be integrated into the Bank's processes, in line with its strategy and the guiding principles approved by the Board. This integration is being conducted with due diligence, particularly in the area of credit-granting, and starting with the corporate credit portfolio. For this clientele, ESG risk is being analyzed using a collection of carbon footprint information and a climate risk classification (transition and physical risks) based on industry as well as scores assigned by ESG-rating agencies. Several other criteria are also being considered, notably waste management, labour standards, corporate governance, product liability, and human rights policies. The Bank plans to gradually extend the collection of such information to clients in other portfolios by adapting the current process.

The Bank collaborates with various industry partners to identify and implement sound management practices to support the transition to a low-carbon economy. Aware that it has a mobilizing role to play, the Bank supports the recommendations of the TCFD and continues to demonstrate its commitment to mitigating climate risk. For example, it has become a signatory to the Partnership for Carbon Accounting Financials (PCAF) as well as the United Nations' Net-Zero Banking Alliance (NZBA). This year, the Bank also began quantifying financed GHG emissions. Specifically, it quantified the emissions of oil and gas producers in its loan portfolio, and it has also set its first interim reduction targets under its PCAF and NZBA commitments. These targets consist of a 31% reduction in the intensity of the portfolio respectively for direct and indirect energy-related emissions and for other indirect emissions. In the next two years, the Bank plans to continue setting GHG emission reduction targets for other portfolios. The Bank has also started examining stress test scenarios to quantify the anticipated losses in the loan portfolio. Also during the year, the Bank joined the UNEP-FI's discussion group on biodiversity protection. This is an initiative seeking to mobilize financial system stakeholders towards biodiversity protection efforts, as the financial risk arising from biodiversity loss may take the form of both physical risk and transition risk. Given that this initiative is in its early stages, the Bank will continue to closely monitor the evolution thereof and take part in discussions. The Bank has also started taking concrete action to meet its commitments and to move its plan forward, notably by quantifying the financial impacts of environmental and social risk. Furthermore, the Bank is committed to transparently communicating information about its progress and its signatory commitments by periodically publishing its own performance reports.

To proactively ensure the strategic positioning of its entire portfolio, the Bank continues to support the transition to a low-carbon economy while closely monitoring the related developments and implications. Doing so involves ongoing and stronger adaptation efforts as well as additional mitigation measures for instances of business interruptions or disruptions caused by major incidents such as natural disasters or health crises. Such measures include the business continuity plan, the operational risk management program, and the disaster risk management program.

(1) Criteria of the LEED (Leadership in Energy and Environmental Design) certification system. LEED certification involves satisfying climate criteria and adaptation characteristics that will help limit potential physical climate risks.
(2) The WELL Standard, administered by the International WELL Building Institute, recognizes environments that support the health and well-being of the occupants.

Critical Accounting Policies and Estimates

A summary of the significant accounting policies used by the Bank is presented in Note 1 to the consolidated financial statements of this *Annual Report*. The accounting policies discussed below are considered critical given their importance to the presentation of the Bank's financial position and operating results and require subjective and complex judgments and estimates on matters that are inherently uncertain. Any change in these judgments and estimates could have a significant impact on the Bank's consolidated financial statements.

The impacts of COVID-19 and the geopolitical landscape, in particular supply chain disruptions and rising inflation, are persisting and creating uncertainty. As a result, establishing reliable estimates and applying judgment continue to be substantially complex. Some of the Bank's accounting policies, such as measurement of expected credit losses (ECLs), require particularly complex judgments and estimates. See Note 1 to the consolidated financial statements for a summary of the most significant estimation processes used to prepare the consolidated financial statements in accordance with IFRS and the valuation techniques used to determine carrying values and fair values of assets and liabilities. The uncertainty regarding certain key inputs used in measuring ECLs is described in Note 7 to the consolidated financial statements.

Classification of Financial Instruments

At initial recognition, all financial instruments are recorded at fair value on the Consolidated Balance Sheet. At initial recognition, financial assets must be classified as subsequently measured at fair value through other comprehensive income, at amortized cost, or at fair value through profit or loss. The Bank determines the classification based on the contractual cash flow characteristics of the financial assets and on the business model it uses to manage these financial assets. At initial recognition, financial liabilities are classified as subsequently measured at amortized cost or as at fair value through profit or loss.

For the purpose of classifying a financial asset, the Bank must determine whether the contractual cash flows associated with the financial asset are solely payments of principal and interest on the principal amount outstanding. The principal is generally the fair value of the financial asset at initial recognition. The interest consists of consideration for the time value of money, for the credit risk associated with the principal amount outstanding during a particular period, and for other basic lending risks and costs as well as of a profit margin. If the Bank determines that the contractual cash flows associated with a financial asset are not solely payments of principal and interest, the financial assets must be classified as measured at fair value through profit or loss.

When classifying financial assets, the Bank determines the business model used for each portfolio of financial assets that are managed together to achieve a same business objective. The business model reflects how the Bank manages its financial assets and the extent to which the financial asset cash flows are generated by the collection of the contractual cash flows, the sale of the financial assets, or both. The Bank determines the business model using scenarios that it reasonably expects to occur. Consequently, the business model determination is a matter of fact and requires the use of judgment and consideration of all the relevant evidence available to the Bank at the date of determination.

A financial asset portfolio falls within a "hold to collect" business model when the Bank's primary objective is to hold these financial assets in order to collect contractual cash flows from them and not to sell them. When the Bank's objective is achieved both by collecting contractual cash flows and by selling the financial assets, the financial asset portfolio falls within a "hold to collect and sell" business model. In this type of business model, collecting contractual cash flows and selling financial assets are both integral components to achieving the Bank's objective for this financial asset portfolio. Financial assets are mandatorily measured at fair value through profit or loss if they do not fall within either a "hold to collect" business model or a "hold to collect and sell" business model.

Fair Value of Financial Instruments

The fair value of a financial instrument is the price that would be received to sell a financial asset or paid to transfer a financial liability in an orderly transaction in the principal market at the measurement date under current market conditions (i.e., an exit price).

Unadjusted quoted prices in active markets, based on bid prices for financial assets and offered prices for financial liabilities, provide the best evidence of fair value. A financial instrument is considered quoted in an active market when prices in exchange, dealer, broker or principal-to-principal markets are accessible at the measurement date. An active market is one where transactions occur with sufficient frequency and volume to provide quoted prices on an ongoing basis.

When there is no quoted price in an active market, the Bank uses another valuation technique that maximizes the use of relevant observable inputs and minimizes the use of unobservable inputs. The chosen valuation technique incorporates all the factors that market participants would consider when pricing a transaction. Judgment is required when applying a large number of acceptable valuation techniques and estimates to determine fair value. The estimated fair value reflects market conditions on the measurement date and, consequently, may not be indicative of future fair value.

The best evidence of the fair value of a financial instrument at initial recognition is the transaction price, i.e., the fair value of the consideration received or paid. If there is a difference between the fair value at initial recognition and the transaction price, and the fair value is determined using a valuation technique based on observable market inputs or, in the case of a derivative, if the risks are fully offset by other contracts entered into with third parties, this difference is recognized in the Consolidated Statement of Income. In other cases, the difference between the fair value at initial recognition and the transaction price is deferred on the Consolidated Balance Sheet. The amount of the deferred gain or loss is recognized over the term of the financial instrument. The unamortized balance is immediately recognized in net income when (i) observable market inputs can be obtained and support the fair value of the transaction, (ii) the risks associated with the initial contract are substantially offset by other contracts entered into with third parties, (iii) the gain or loss is realized through a cash receipt or payment, or (iv) the transaction matures or is terminated before maturity.

In certain cases, measurement adjustments are recognized to address factors that market participants would use at the measurement date to determine fair value but that are not included in the valuation technique due to system limitations or uncertainty surrounding the measure. These factors include, but are not limited to, the unobservable nature of inputs used in the valuation model, assumptions about risk such as market risk, credit risk, or valuation model risk and future administration costs. The Bank may also consider market liquidity risk when determining the fair value of financial instruments when it believes these instruments could be disposed of for a consideration below the fair value otherwise determined due to a lack of market liquidity or an insufficient volume of transactions in a given market. The measurement adjustments also include the funding valuation adjustment applied to derivative financial instruments to reflect the market implied cost or benefits of funding collateral for uncollateralized or partly collateralized transactions.

IFRS establishes a fair value measurement hierarchy that classifies the inputs used in financial instrument fair value measurement techniques according to three levels. The fair value measurement hierarchy has the following levels:

Level 1
Inputs corresponding to unadjusted quoted prices in active markets for identical assets and liabilities and accessible to the Bank at the measurement date. These instruments consist primarily of equity securities, derivative financial instruments traded in active markets, and certain highly liquid debt securities actively traded in over-the-counter markets.

Level 2
Valuation techniques based on inputs, other than the quoted prices included in Level 1 inputs, that are directly or indirectly observable in the market for the asset or liability. These inputs are quoted prices of similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; inputs other than quoted prices used in a valuation model that are observable for that instrument; and inputs that are derived principally from or corroborated by observable market inputs by correlation or other means. These instruments consist primarily of certain loans, certain deposits, derivative financial instruments traded in over-the-counter markets, certain debt securities, certain equity securities whose value is not directly observable in an active market, liabilities related to transferred receivables, and certain other liabilities.

Level 3
Valuation techniques based on one or more significant inputs that are not observable in the market for the asset or liability. The Bank classifies financial instruments in Level 3 when the valuation technique is based on at least one significant input that is not observable in the markets. The valuation technique may also be partly based on observable market inputs. Financial instruments whose fair values are classified in Level 3 consist of investments in hedge funds, certain derivative financial instruments, equity and debt securities of private companies, certain loans, certain deposits (structured deposit notes), and certain other assets.

Establishing fair value is an accounting estimate and has an impact on the following items: *Securities at fair value through profit or loss*, certain *Loans*, *Securities at fair value through other comprehensive income*, *Obligations related to securities sold short*, *Derivative financial instruments*, financial instruments designated at fair value through profit or loss, and financial instruments designated at fair value through other comprehensive income on the Consolidated Balance Sheet. This estimate also has an impact on *Non-interest income* in the Consolidated Statement of Income of the Financial Markets segment and of the *Other* heading. Lastly, this estimate has an impact on *Other comprehensive income* in the Consolidated Statement of Comprehensive Income. For additional information on the fair value determination of financial instruments, see Notes 3 and 6 to the consolidated financial statements.

Impairment of Financial Assets

At the end of each reporting period, the Bank applies a three-stage impairment approach to measure the expected credit losses (ECL) on all debt instruments measured at amortized cost or at fair value through other comprehensive income and on loan commitments and financial guarantees that are not measured at fair value. ECLs are a probability-weighted estimate of credit losses over the remaining expected life of the financial instrument. The ECL model is forward looking. Measurement of ECLs at each reporting period reflects reasonable and supportable information about past events, current conditions, and forecasts of future events and economic conditions. Judgment is required in making assumptions and estimates, determining movements between the three stages, and applying forward-looking information. Any changes in assumptions and estimates, as well as the use of different, but equally reasonable, estimates and assumptions, could have an impact on the allowances for credit losses and the provisions for credit losses for the year. All business segments are affected by this accounting estimate. For additional information, see Note 7 to the consolidated financial statements.

Determining the Stage

The ECL three-stage impairment approach is based on the change in the credit quality of financial assets since initial recognition. If, at the reporting date, the credit risk of non-impaired financial instruments has not increased significantly since initial recognition, these financial instruments are classified in Stage 1, and an allowance for credit losses that is measured, at each reporting date, in an amount equal to 12-month expected credit losses, is recorded. When there is a significant increase in credit risk since initial recognition, these non-impaired financial instruments are migrated to Stage 2, and an allowance for credit losses that is measured, at each reporting date, in an amount equal to lifetime expected credit losses, is recorded. In subsequent reporting periods, if the credit risk of a financial instrument improves such that there is no longer a significant increase in credit risk since initial recognition, the ECL model requires reverting to Stage 1, i.e., recognition of 12-month expected credit losses. When one or more events that have a detrimental impact on the estimated future cash flows of a financial asset occurs, the financial asset is considered credit-impaired and is migrated to Stage 3, and an allowance for credit losses equal to lifetime expected credit losses continues to be recorded or the financial asset is written off. Interest income is calculated on the gross carrying amount for financial assets in Stages 1 and 2 and on the net carrying amount for financial assets in Stage 3.

Assessment of Significant Increase in Credit Risk

In determining whether credit risk has increased significantly, the Bank uses an internal credit risk grading system, external risk ratings, and forward-looking information to assess deterioration in the credit quality of a financial instrument. To assess whether or not the credit risk of a financial instrument has increased significantly, the Bank compares the probability of default (PD) occurring over its expected life as at the reporting date with the PD occurring over its expected life on the date of initial recognition and considers reasonable and supportable information indicative of a significant increase in credit risk since initial recognition. The Bank includes relative and absolute thresholds in the definition of significant increase in credit risk and a backstop of 30 days past due. All financial instruments that are 30 days past due are migrated to Stage 2 even if other metrics do not indicate that a significant increase in credit risk has occurred. The assessment of a significant increase in credit risk requires significant judgment.

Measurement of Expected Credit Losses

ECLs are measured as the probability-weighted present value of all expected cash shortfalls over the remaining expected life of the financial instrument, and reasonable and supportable information about past events, current conditions, and forecasts of future events and economic conditions is considered. The estimation and application of forward-looking information requires significant judgment. Cash shortfalls represent the difference between all contractual cash flows owed to the Bank and all cash flows that the Bank expects to receive.

The measurement of ECLs is primarily based on the product of the financial instrument's PD, loss given default (LGD) and exposure at default (EAD). Forward-looking macroeconomic factors such as unemployment rates, housing price indices, interest rates, and gross domestic product (GDP) are incorporated into the risk parameters. The estimate of expected credit losses reflects an unbiased and probability-weighted amount that is determined by evaluating a range of possible outcomes. The Bank incorporates three forward-looking macroeconomic scenarios in its ECL calculation process: a base scenario, an upside scenario, and a downside scenario. Probability weights are assigned to each scenario. The scenarios and probability weights are reassessed quarterly and are subject to management review. The Bank applies experienced credit judgment to adjust the modelled ECL results when it becomes evident that known or expected risk factors and information were not considered in the credit risk rating and modelling process.

ECLs for all financial instruments are recognized in *Provisions for credit losses* in the Consolidated Statement of Income. In the case of debt instruments measured at fair value through other comprehensive income, ECLs are recognized in *Provisions for credit losses* in the Consolidated Statement of Income, and a corresponding amount is recognized in *Other comprehensive income* with no reduction in the carrying amount of the asset on the Consolidated Balance Sheet. As for debt instruments measured at amortized cost, they are presented net of the related allowances for credit losses on the Consolidated Balance Sheet. Allowances for credit losses for off-balance-sheet credit exposures that are not measured at fair value are included in *Other liabilities* on the Consolidated Balance Sheet.

Purchased or Originated Credit-Impaired Financial Assets
On initial recognition of a financial asset, the Bank determines whether the asset is credit-impaired. For financial assets that are credit-impaired upon purchase or origination, the lifetime expected credit losses are reflected in the initial fair value. In subsequent reporting periods, the Bank recognizes only the cumulative changes in these lifetime ECLs since initial recognition as an allowance for credit losses. The Bank recognizes changes in ECLs in *Provisions for credit losses* in the Consolidated Statement of Income, even if the lifetime ECLs are less than the ECLs that were included in the estimated cash flows on initial recognition.

Definition of Default
The definition of default used by the Bank to measure ECLs and transfer financial instruments between stages is consistent with the definition of default used for internal credit risk management purposes. The Bank considers a financial asset, other than a credit card receivable, to be credit-impaired when one or more events that have a detrimental impact on the estimated future cash flows of the financial asset have occurred or when contractual payments are 90 days past due. Credit card receivables are considered credit-impaired and are fully written off at the earlier of the following dates: when a notice of bankruptcy is received, a settlement proposal is made, or contractual payments are 180 days past due.

Write-Offs
A financial asset and its related allowance for credit losses are normally written off in whole or in part when the Bank considers the probability of recovery to be non-existent and when all guarantees and other remedies available to the Bank have been exhausted or if the borrower is bankrupt or winding up and balances owing are not likely to be recovered.

Impairment of Non-Financial Assets

Premises and equipment and intangible assets with finite useful lives are tested for impairment when events or changes in circumstances indicate that their carrying value may not be recoverable. At the end of each reporting period, the Bank determines whether there is an indication that premises and equipment or intangible assets with finite useful lives may be impaired. Goodwill and intangible assets that are not available for use or that have indefinite useful lives are tested for impairment annually or more frequently if there is an indication that the asset might be impaired.

An impairment test compares the carrying amount of an asset with its recoverable amount. The recoverable amount must be estimated for the individual asset. Where it is not possible to estimate the recoverable amount of an individual asset, the recoverable amount of the cash-generating unit (CGU) to which the asset belongs will be determined. Goodwill is always tested for impairment at the level of a CGU or a group of CGUs. A CGU is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets. The Bank uses judgment to identify CGUs.

An asset's recoverable amount is the higher of fair value less costs to sell and the value in use of the asset or CGU. Value in use is the present value of expected future cash flows from the asset or CGU. The recoverable amount of the CGU is determined using valuation models that consider various factors such as projected future cash flows, discount rates, and growth rates. The use of different estimates and assumptions in applying the impairment tests could have a significant impact on income. If the recoverable amount of an asset or a CGU is less than its carrying amount, the carrying amount is reduced to its recoverable amount and an impairment loss is recognized in *Non-interest expenses* in the Consolidated Statement of Income.

Management exercises judgment when determining whether there is objective evidence that premises and equipment or intangible assets with finite useful lives may be impaired. It also uses judgment in determining to which CGU or group of CGUs an asset or goodwill is to be allocated. Moreover, for impairment assessment purposes, management must make estimates and assumptions regarding the recoverable amount of non-financial assets, CGUs, or a group of CGUs. For additional information on the estimates and assumptions used to calculate the recoverable amount of an asset or CGU, see Note 11 to the consolidated financial statements.

Any changes to these estimates and assumptions may have an impact on the recoverable amount of a non-financial asset and, consequently, on impairment testing results. These accounting estimates have an impact on *Premises and equipment*, *Intangible assets* and *Goodwill* reported on the Consolidated Balance Sheet. The aggregate impairment loss, if any, is recognized as a non-interest expense for the corresponding segment and presented in the *Other* item.

Employee Benefits – Pension Plans and Other Post-Employment Benefit Plans

The expense and obligation of the defined benefit component of the pension plans and other post-employment benefit plans are actuarially determined using the projected benefit method prorated on service. The calculations incorporate management's best estimates of various actuarial assumptions such as discount rates, rates of compensation increase, health care cost trend rates, mortality rates, and retirement age.

Remeasurements of these plans represent the actuarial gains and losses related to the defined benefit obligation and the actual return on plan assets, excluding the net interest determined by applying a discount rate to the net asset or net liability of the plans. Remeasurements are immediately recognized in *Other comprehensive income* and are not subsequently reclassified to net income; these cumulative gains and losses are reclassified to *Retained earnings*.

The use of different assumptions could have a significant impact on the defined benefit asset (liability) presented in *Other assets (Other liabilities)* on the Consolidated Balance Sheet, on the pension plan and other post-employment benefit plan expenses presented in *Compensation and employee benefits* in the Consolidated Statement of Income, as well as on *Remeasurements of pension plans and other post-employment benefit plans* presented in *Other comprehensive income*. All business segments are affected by this accounting estimate. For additional information, including the significant assumptions used to determine the Bank's pension plan and other post-employment benefit plan expenses and the sensitivity analysis for significant plan assumptions, see Note 23 to the consolidated financial statements.

Income Taxes

The Bank makes assumptions to estimate income taxes as well as deferred tax assets and liabilities. This process involves estimating the actual amount of current taxes and evaluating tax loss carryforwards and temporary differences arising from differences between the values of items reported for accounting and for income tax purposes. Deferred tax assets and liabilities, presented in *Other assets* and *Other liabilities* on the Consolidated Balance Sheet, are calculated according to the tax rates to be applied in future periods. Previously recorded deferred tax assets and liabilities must be adjusted when the date of the future event is revised based on current information. The Bank periodically evaluates deferred tax assets to assess recoverability. In the Bank's opinion, based on the information at its disposal, it is probable that all deferred tax assets will be realized before they expire.

This accounting estimate affects *Income taxes* in the Consolidated Statement of Income for all business segments. For additional information on income taxes, see Notes 1 and 24 to the consolidated financial statements.

Litigation

In the normal course of business, the Bank and its subsidiaries are involved in various claims relating, among other matters, to loan portfolios, investment portfolios, and supplier agreements, including court proceedings, investigations or claims of a regulatory nature, class actions, or other legal remedies of varied natures.

More specifically, the Bank is involved as a defendant in class actions instituted by consumers contesting, *inter alia*, certain transaction fees or who wish to avail themselves of certain legislative provisions relating to consumer protection. The recent developments in the main legal proceeding involving the Bank are as follows:

Defrance
On January 21, 2019, the Quebec Superior Court authorized a class action against the National Bank and several other Canadian financial institutions. The originating application was served to the Bank on April 23, 2019. The class action was initiated on behalf of consumers residing in Quebec. The plaintiffs allege that non-sufficient funds charges, billed by all of the defendants when a payment order is refused due to non-sufficient funds, are illegal and prohibited by the *Consumer Protection Act*. The plaintiffs are claiming, in the form of damages, the repayment of these charges as well as punitive damages.

It is impossible to determine the outcome of the claims instituted or which may be instituted against the Bank and its subsidiaries. The Bank estimates, based on the information at its disposal, that while the amount of contingent liabilities pertaining to these claims, taken individually or in the aggregate, could have a material impact on the Bank's consolidated results of operations for a particular period, it would not have a material adverse impact on the Bank's consolidated financial position.

Provisions are liabilities of uncertain timing and amount. A provision is recognized when the Bank has a present obligation (legal or constructive) arising from a past event, when it is probable that an outflow of economic resources will be required to settle the obligation and when the amount of the obligation can be reliably estimated. Provisions are based on the Bank's best estimates of the economic resources required to settle the present obligation, given all relevant risks and uncertainties, and, when it is significant, the effect of the time value of money.

The recognition of a litigation provision requires the Bank's management to assess the probability of loss and estimate any potential monetary impact. The Bank examines each litigation provision individually by considering the development of each case, its past experience in similar transactions and the opinion of its legal counsel. Each new piece of information can alter the Bank's assessment as to the probability and estimated amount of the loss and the extent to which it adjusts the recorded provision. Moreover, the actual settlement cost of these litigations can be significantly higher or lower than the amounts recognized.

Structured Entities

In the normal course of business, the Bank enters into arrangements and transactions with structured entities. Structured entities are entities designed so that voting or similar rights are not the dominant factor in deciding who controls the entity, such as when voting rights relate solely to administrative tasks and the relevant activities are directed by means of contractual arrangements. A structured entity is consolidated when the Bank concludes, after evaluating the substance of the relationship and its right or exposure to variable returns, that it controls that entity. Management must exercise judgment in determining whether the Bank controls an entity. Additional information is provided in the Securitization and Off-Balance-Sheet Arrangements section of this MD&A and in Note 27 to the consolidated financial statements.

Accounting Policy Changes

Cloud Computing Arrangements – Final Agenda Decision by IFRIC
In April 2021, IFRIC issued a final agenda decision on accounting for the costs of configuring or customizing a supplier's software as part of a cloud computing or SaaS (Software as a Service) arrangement. The main conclusion was that, if the incurred configuration or customization costs do not give rise to an intangible asset that is separate from the software or if the services received are distinct from the software, those costs are expensed as incurred. IFRIC decided that the relevant accounting standards (IAS 38 – *Intangible Assets* and IFRS 15 – *Revenue From Contracts With Customers*) contain sufficient guidance and that the conclusions, as indicated in the final agenda decision, are part of the interpretation of IFRS. As such, any change arising from these interpretations must be accounted for as a retrospectively applied accounting policy change in accordance with IAS 8 – *Accounting Policies, Changes in Accounting Estimates and Errors*.

During fiscal 2022, the Bank completed an assessment of the impacts of this change in accounting policy. The change was applied retrospectively and had the following impacts on the consolidated financial statements:

- As at November 1, 2020: A $186 million decrease in *Intangible assets*, a $49 million increase in *Other assets – Deferred tax assets,* and a $137 million decrease in *Retained earnings*;
- As at October 31, 2021: A $50 million decrease in *Intangible assets* and a $13 million increase in *Other assets – Deferred tax assets*;
- For the year ended October 31, 2021: A $50 million increase in *Non-interest expenses – Technology*, a $13 million decrease in *Income taxes*, a $37 million decrease in *Net income* and *Net income attributable to common shareholders*, and a $0.11 decrease in *Earnings per share – Basic and diluted*.

For the year ended October 31, 2022, the impacts of this accounting policy change on the Consolidated Statement of Income consisted of a $10 million increase in *Non-interest expenses – Technology* and a $3 million decrease in *Income taxes*.

Future Accounting Policy Changes

The Bank closely monitors both new accounting standards and amendments to existing accounting standards issued by the IASB. The following standard has been issued but is not yet in effect. The Bank is currently assessing the impacts of applying this standard on the consolidated financial statements.

Effective Date – November 1, 2023
IFRS 17 – *Insurance Contracts*
In May 2017, the IASB issued IFRS 17 – *Insurance Contracts* (IFRS 17), a new standard that replaces IFRS 4, the current insurance contract accounting standard. IFRS 17 introduces a new accounting framework that will improve the comparability and quality of financial information. IFRS 17 provides guidance on the recognition, measurement, presentation and disclosure of insurance contracts. IFRS 17 will affect how an entity accounts for its insurance contracts and how it reports financial performance in the consolidated income statement, in particular the timing of revenue recognition for insurance contracts. In June 2020, the IASB issued amendments to IFRS 17 that included a two-year deferral of the effective date along with other changes aimed at addressing concerns and implementation challenges identified after IFRS 17 was published in 2017. IFRS 17, as amended, is to be applied retrospectively for annual periods beginning on or after January 1, 2023. If full retrospective application to a group of insurance contracts is impracticable, the modified retrospective approach or the fair value approach may be used.

To prepare for the application of IFRS 17, the Bank developed a project, set up a specialized team, and established a formal governance structure. It also started executing a detailed plan for the project that defines key activities and the timing of those activities. The project is progressing according to schedule. The Bank is continuing to assess all of the impacts of applying IFRS 17 on its consolidated financial statements as well as on the financial statements of its insurance subsidiary.

Additional Financial Information

Table 1 – Quarterly Results

(millions of Canadian dollars, except per share amounts)					2022[1]
	Total	Q4	Q3	Q2	Q1
Statement of income data					
Net interest income	5,271	1,207	1,419	1,313	1,332
Non-interest income[2]	4,381	1,127	994	1,126	1,134
Total revenues	9,652	2,334	2,413	2,439	2,466
Non-interest expenses[3]	5,230	1,346	1,305	1,299	1,280
Income before provisions for credit losses and income taxes	4,422	988	1,108	1,140	1,186
Provisions for credit losses	145	87	57	3	(2)
Income taxes	894	163	225	248	258
Net income	3,383	738	826	889	930
Non-controlling interests	(1)	–	–	(1)	–
Net income attributable to the Bank's shareholders and holders of other equity instruments	3,384	738	826	890	930
Earnings per common share					
Basic	$ 9.72	$ 2.10	$ 2.38	$ 2.56	$ 2.67
Diluted	9.61	2.08	2.35	2.53	2.64
Dividends (per share)					
Common	$ 3.58	$ 0.92	$ 0.92	$ 0.87	$ 0.87
Preferred					
Series 30	1.0063	0.2516	0.2516	0.2515	0.2516
Series 32	0.9598	0.2400	0.2399	0.2400	0.2399
Series 34	–	–	–	–	–
Series 36	–	–	–	–	–
Series 38	1.1125	0.2781	0.2781	0.2782	0.2781
Series 40	1.1500	0.2875	0.2875	0.2875	0.2875
Series 42	1.2375	0.3094	0.3093	0.3094	0.3094
Return on common shareholders' equity[4]	18.8 %	15.3 %	17.9 %	20.7 %	21.9 %
Total assets		403,740	386,833	369,570	366,680
Subordinated debt[5]		1,499	1,510	764	766
Net impaired loans excluding POCI loans[4]		479	301	293	287
Number of common shares outstanding *(thousands)*					
Average – Basic	337,099	336,530	336,437	337,381	338,056
Average – Diluted	340,837	339,910	339,875	341,418	342,318
End of period		336,582	336,456	336,513	338,367
Per common share					
Book value[4]		$ 55.24	$ 54.29	$ 52.28	$ 49.71
Share price					
High	$ 105.44	94.37	97.87	104.59	105.44
Low	83.12	83.12	83.33	89.33	94.37
Number of employees – Worldwide		29,509	28,903	28,189	27,804
Number of branches in Canada		378	384	385	385

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to the consolidated financial statements.
(2) For fiscal 2020, the *Non-interest income* item had included a foreign currency translation loss on a disposal of subsidiaries of $24 million.
(3) For fiscal 2021, the *Non-interest expenses* item had included $9 million in intangible asset impairment losses (2020: $71 million impairment loss on premises and equipment and intangible assets). For fiscal 2020, the *Non-interest expenses* item had included $48 million in severance pay and a $13 million charge related to Maple Financial Group Inc. (Maple).
(4) See the Glossary section on pages 122 to 125 for details on the composition of these measures.
(5) Long-term financial liabilities.

				2021[1]					2020[1]
Total	Q4	Q3	Q2	Q1	Total	Q4	Q3	Q2	Q1
4,783	1,190	1,230	1,156	1,207	4,255	1,124	1,096	1,105	930
4,144	1,021	1,024	1,082	1,017	3,672	876	872	931	993
8,927	2,211	2,254	2,238	2,224	7,927	2,000	1,968	2,036	1,923
4,903	1,268	1,224	1,217	1,194	4,616	1,267	1,096	1,144	1,109
4,024	943	1,030	1,021	1,030	3,311	733	872	892	814
2	(41)	(43)	5	81	846	110	143	504	89
882	215	240	228	199	434	136	144	25	129
3,140	769	833	788	750	2,031	487	585	363	596
–	–	–	–	–	42	2	13	11	16
3,140	769	833	788	750	1,989	485	572	352	580
$ 8.95	$ 2.20	$ 2.38	$ 2.24	$ 2.13	$ 5.57	$ 1.35	$ 1.62	$ 0.96	$ 1.65
8.85	2.17	2.35	2.21	2.12	5.54	1.34	1.61	0.96	1.63
$ 2.84	$ 0.71	$ 0.71	$ 0.71	$ 0.71	$ 2.84	$ 0.71	$ 0.71	$ 0.71	$ 0.71
1.0063	0.2516	0.2516	0.2515	0.2516	1.0063	0.2516	0.2516	0.2515	0.2516
0.9598	0.2400	0.2399	0.2400	0.2399	0.9636	0.2400	0.2399	0.2399	0.2438
0.7000	–	–	0.3500	0.3500	1.4000	0.3500	0.3500	0.3500	0.3500
1.0125	–	0.3375	0.3375	0.3375	1.3500	0.3375	0.3375	0.3375	0.3375
1.1125	0.2781	0.2781	0.2782	0.2781	1.1125	0.2781	0.2781	0.2782	0.2781
1.1500	0.2875	0.2875	0.2875	0.2875	1.1500	0.2875	0.2875	0.2875	0.2875
1.2375	0.3094	0.3093	0.3094	0.3094	1.2375	0.3094	0.3093	0.3094	0.3094
20.7 %	18.7 %	21.4 %	21.8 %	21.1 %	14.6 %	13.7 %	16.7 %	10.3 %	17.7 %
	355,621	353,873	350,581	343,489		331,488	322,321	316,835	289,092
	768	769	771	773		775	777	779	774
	283	312	349	400		465	453	479	436
337,212	337,779	337,517	337,142	336,408	335,508	335,859	335,552	335,603	335,020
340,861	342,400	341,818	340,614	338,617	337,580	338,264	337,231	337,317	338,111
	337,912	337,587	337,372	336,770		335,998	335,666	335,400	335,818
	$ 47.44	$ 45.51	$ 43.11	$ 41.04		$ 39.56	$ 38.51	$ 38.40	$ 37.29
$ 104.32	104.32	96.97	89.42	73.81	$ 74.79	72.85	65.54	74.79	74.22
65.54	95.00	89.47	72.30	65.54	38.73	62.99	51.38	38.73	68.25
	26,920	26,428	26,211	26,231		26,517	26,544	26,589	26,314
	384	389	401	402		403	409	413	416

Table 2 – Overview of Results

Year ended October 31[1] (millions of Canadian dollars)	2022	2021	2020	2019	2018
Net interest income	**5,271**	4,783	4,255	3,596	3,382
Non-interest income[2]	**4,381**	4,144	3,672	3,836	3,784
Total revenues	**9,652**	8,927	7,927	7,432	7,166
Non-interest expenses[3]	**5,230**	4,903	4,616	4,375	4,100
Income before provisions for credit losses and income taxes	**4,422**	4,024	3,311	3,057	3,066
Provisions for credit losses	**145**	2	846	347	327
Income before income taxes	**4,277**	4,022	2,465	2,710	2,739
Income taxes	**894**	882	434	443	534
Net income	**3,383**	3,140	2,031	2,267	2,205
Non-controlling interests	**(1)**	–	42	66	87
Net income attributable to the Bank's shareholders and holders of other equity instruments	**3,384**	3,140	1,989	2,201	2,118

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to the consolidated financial statements.
(2) For fiscal 2021, *Non-interest income* had included a $33 million gain following a remeasurement of the previously held equity interest in Flinks and a $30 million loss related to the fair value measurement of the Bank's equity interest in AfrAsia (2020: $24 million foreign currency translation loss on a disposal of subsidiaries; 2019: $79 million gain on disposal of Fiera Capital Corporation shares, $50 million gain on disposal of premises and equipment, and $33 million loss resulting from the fair value measurement of an investment).
(3) For fiscal 2021, *Non-interest expenses* had included $9 million in intangible asset impairment losses (2020: $71 million in impairment losses on premises and equipment and intangible assets; 2019: $57 million). For fiscal 2020, *Non-interest expenses* had included $48 million in severance pay (2019: $10 million) and a $13 million charge related to Maple (2019: $11 million). An amount of $45 million in provisions for onerous contracts had been recorded in 2019.

Table 3 – Changes in Net Interest Income

Year ended October 31 (millions of Canadian dollars)	2022	2021	2020	2019	2018
Personal and Commercial[1]					
Net interest income	**2,865**	2,547	2,420	2,360	2,256
Average assets[2]	**140,514**	126,637	115,716	111,140	105,460
Average interest-bearing assets[2][3]	**133,754**	120,956	110,544	106,995	101,446
Net interest margin[3]	**2.14 %**	2.11 %	2.19 %	2.21 %	2.22 %
Wealth Management					
Net interest income on a taxable equivalent basis[4]	**594**	446	442	455	426
Average assets[2]	**8,226**	7,146	5,917	6,219	6,167
Financial Markets[1]					
Net interest income on a taxable equivalent basis[4]	**1,258**	1,262	971	498	429
Average assets[2]	**154,349**	151,240	125,565	114,151	102,118
USSF&I					
Net interest income	**1,090**	907	807	656	584
Average assets[2]	**18,890**	16,150	14,336	10,985	9,270
Other					
Net interest income[4]	**(536)**	(379)	(385)	(373)	(313)
Average assets[2][5]	**71,868**	62,333	56,553	43,667	42,925
Total					
Net interest income	**5,271**	4,783	4,255	3,596	3,382
Average assets[2][5]	**393,847**	363,506	318,087	286,162	265,940

(1) For fiscal years prior to 2022, certain amounts have been reclassified, in particular amounts of the loan portfolio of borrowers in the "Oil and gas" and "Pipelines" sectors as well as related activities, which were transferred from the Personal and Commercial segment to the Financial Markets segment.
(2) Represents an average of the daily balances for the period.
(3) See the Glossary section on pages 122 to 125 for details on the composition of these measures.
(4) For fiscal 2022, the *Net interest income* of the Financial Markets segment was grossed up by $229 million (2021: $175 million; 2020: $202 million; 2019: $191 million; 2018: $141 million), the *Net interest income* of the *Other* heading was grossed up by $5 million (2021: $6 million; 2020: $6 million; 2019: $3 million; 2018: $3 million), the *Net interest income* of the Wealth Management segment was grossed up by $1 million in 2019. The effect of these adjustments is reversed under the *Other* heading.
(5) The amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements (for additional information, see Note 1 to the consolidated financial statements), except for the fiscal 2019 and 2018 figures.

Table 4 – Non-Interest Income

Year ended October 31 (millions of Canadian dollars)	2022	2021	2020	2019	2018
Underwriting and advisory fees	**324**	415	314	246	322
Securities brokerage commissions	**204**	238	204	166	169
Mutual fund revenues	**587**	563	477	449	438
Investment management and trust service fees	**997**	900	735	677	665
Credit fees	**155**	164	147	134	126
Revenues from acceptances, letters of credit and guarantee	**335**	342	320	283	277
Card revenues	**186**	148	138	175	159
Deposit and payment service charges	**298**	274	262	271	280
Trading revenues (losses)	**543**	268	544	788	801
Gains (losses) on non-trading securities, net	**113**	151	93	77	77
Insurance revenues, net	**158**	131	128	136	121
Foreign exchange revenues, other than trading	**211**	202	164	137	134
Share in the net income of associates and joint ventures	**28**	23	28	34	28
Other[1]	**242**	325	118	263	187
	4,381	4,144	3,672	3,836	3,784
Canada	**4,299**	3,992	3,574	3,645	3,488
United States	**18**	106	5	85	108
Other countries	**64**	46	93	106	188
Non-interest income as a % of total revenues	**45.4 %**	46.4 %	46.3 %	51.6 %	52.8 %

(1) For fiscal 2021, *Other* revenues had included a $33 million gain following a remeasurement of the previously held equity interest in Flinks and a $30 million loss related to the fair value measurement of the Bank's equity interest in AfrAsia (2020: $24 million foreign currency translation loss on a disposal of subsidiaries; 2019: $79 million gain on disposal of Fiera Capital Corporation shares, $50 million gain on disposal of premises and equipment, and $33 million loss resulting from the fair value measurement of an investment).

Table 5 – Trading Activity Revenues

Year ended October 31 (millions of Canadian dollars)	2022	2021	2020	2019	2018
Net interest income related to trading activity[1]	**682**	777	522	28	44
Taxable equivalent basis[2]	**229**	171	202	188	138
Net interest income related to trading activity on a taxable equivalent basis[2]	**911**	948	724	216	182
Non-interest income related to trading activity[1]	**548**	282	625	800	822
Taxable equivalent basis[2]	**48**	8	57	135	101
Non-interest income related to trading activity on a taxable equivalent basis[2]	**596**	290	682	935	923
Trading activity revenues[1]	**1,230**	1,059	1,147	828	866
Taxable equivalent basis[2]	**277**	179	259	323	239
Trading activity revenues on a taxable equivalent basis[2]	**1,507**	1,238	1,406	1,151	1,105
Trading activity revenues by segment on a taxable equivalent basis[2]					
Financial Markets					
Equities	**979**	685	706	621	575
Fixed-income	**367**	357	430	285	263
Commodities and foreign exchange	**156**	128	132	126	130
	1,502	1,170	1,268	1,032	968
Other segments	**5**	68	138	119	137
	1,507	1,238	1,406	1,151	1,105

(1) See the Glossary section on pages 122 to 125 for details on the composition of these measures.
(2) See the Financial Reporting Method section on pages 16 to 21 for additional information on non-GAAP financial measures. The taxable equivalent basis presented in this table is related to trading portfolios. The Bank also uses the taxable equivalent basis for certain investment portfolios, and the amounts stood at $5 million for fiscal 2022 (2021: $10 million; 2020: $6 million; 2019: $7 million; 2018: $6 million).

Table 6 – Non-Interest Expenses

Year ended October 31[1] (millions of Canadian dollars)	2022	2021	2020	2019	2018
Compensation and employee benefits[2]	**3,284**	3,027	2,713	2,532	2,466
Occupancy[3]	**157**	147	151	254	193
Amortization – Premises and equipment	**155**	152	140	44	43
Technology	**589**	557	510	446	412
Amortization – Technology[4]	**326**	314	366	332	245
Communications	**57**	53	58	62	63
Professional fees	**249**	246	244	249	244
Travel and business development	**144**	109	103	128	128
Capital and payroll taxes	**32**	52	73	70	79
Other[5]	**237**	246	258	258	227
Total	**5,230**	4,903	4,616	4,375	4,100
Canada	**4,760**	4,478	4,195	4,005	3,787
United States	**209**	203	209	210	205
Other countries	**261**	222	212	160	108
Efficiency ratio[6]	**54.2 %**	54.9 %	58.2 %	58.9 %	57.2 %

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to the consolidated financial statements.
(2) For fiscal 2020, *Compensation and employee benefits* had included $48 million in severance pay (2019: $10 million).
(3) For fiscal 2019, *Occupancy* expense had included $45 million in provisions for onerous contracts.
(4) For fiscal 2021, the *Amortization – Technology* expense had included $9 million in intangible asset impairment losses (2020: $71 million in impairment losses on premises and equipment and intangible assets; 2019: $57 million).
(5) For fiscal 2020, *Other* expenses had included a $13 million charge related to Maple (2019: $11 million).
(6) See the Glossary section on pages 122 to 125 for details on the composition of these measures.

Table 7 – Provisions for Credit Losses[1]

Year ended October 31 (millions of Canadian dollars)	2022	2021	2020	2019	2018
Personal Banking[2]					
Impaired loans – Stage 3	**75**	65	147	166	158
Non-impaired loans – Stages 1 and 2	**9**	(77)	121	8	9
	84	(12)	268	174	167
Commercial Banking[3]					
Impaired loans – Stage 3	**13**	26	76	31	28
Non-impaired loans – Stages 1 and 2	**–**	26	103	19	14
	13	52	179	50	42
Wealth Management					
Impaired loans – Stage 3	**1**	1	4	–	–
Non-impaired loans – Stages 1 and 2	**2**	–	3	–	1
	3	1	7	–	1
Financial Markets[3]					
Impaired loans – Stage 3	**1**	78	99	22	12
Non-impaired loans – Stages 1 and 2	**(24)**	(102)	210	21	11
	(23)	(24)	309	43	23
USSF&I					
Impaired loans – Stage 3	**48**	13	46	94	126
Non-impaired loans – Stages 1 and 2	**12**	(2)	41	(24)	(3)
POCI loans	**6**	(26)	(7)	10	(29)
	66	(15)	80	80	94
Other					
Impaired loans – Stage 3	**–**	–	–	–	–
Non-impaired loans – Stages 1 and 2	**2**	–	3	–	–
	2	–	3	–	–
Total provisions for credit losses					
Impaired loans – Stage 3	**138**	183	372	313	324
Non-impaired loans – Stages 1 and 2	**1**	(155)	481	24	32
POCI loans	**6**	(26)	(7)	10	(29)
	145	2	846	347	327
Average loans and acceptances	**194,340**	172,323	159,275	148,765	139,603
Provisions for credit losses on impaired loans excluding POCI loans as a % of average loans and acceptances[4]	**0.07 %**	0.11 %	0.23 %	0.21 %	0.23 %
Provisions for credit losses as a % of average loans and acceptances[4]	**0.07 %**	– %	0.53 %	0.23 %	0.23 %

(1) The *Impaired loans – Stage 3* category presented in this table reflects provisions for credit losses on loans classified in Stage 3 of the expected credit loss model and excludes POCI loans.
(2) Includes credit card receivables.
(3) For fiscal years prior to 2022, certain amounts have been reclassified to reflect a transfer of the loan portfolio of borrowers in the "Oil and gas" and "Pipelines" sectors from the Personal and Commercial segment to the Financial Markets segment.
(4) See the Glossary section on pages 122 to 125 for details on the composition of these measures.

Table 8 – Change in Average Volumes[1]

Year ended October 31 (millions of Canadian dollars)	2022		2021		2020		2019		2018	
	Average volume $	Rate %	Average volume $	Rate %	Average volume $	Rate %	Average volume $	Rate %	Average volume $	Rate %
Assets										
Deposits with financial institutions	**42,042**	**1.55**	40,294	0.31	24,966	0.44	13,172	1.64	16,322	1.27
Securities	**111,863**	**1.77**	116,023	1.25	97,025	1.63	85,772	1.74	75,923	1.45
Securities purchased under reverse repurchase agreements and securities borrowed	**16,255**	**2.08**	11,559	0.90	16,408	1.39	22,472	1.60	20,090	1.09
Residential mortgage loans	**75,712**	**2.90**	68,297	2.93	59,801	3.13	54,493	3.30	51,509	3.07
Personal loans	**42,723**	**3.82**	38,434	3.16	36,273	3.68	35,816	4.25	35,041	3.98
Credit card receivables	**2,133**	**12.81**	1,864	13.47	1,995	14.62	2,221	14.06	2,165	13.69
Business and government loans	**58,947**	**3.63**	51,229	3.06	47,272	4.13	42,922	5.34	38,204	5.06
POCI loans	**493**	**32.68**	686	22.64	1,073	16.45	1,386	13.37	1,486	13.12
Average interest-bearing assets[1]	**350,168**	**2.75**	328,386	2.13	284,813	2.66	258,254	3.17	240,740	2.88
Other assets[2]	**43,679**		35,120		33,274		27,908		25,200	
	393,847	**2.43**	363,506	1.93	318,087	2.38	286,162	2.86	265,940	2.61
Liabilities and equity										
Personal deposits	**72,927**	**0.67**	68,334	0.42	63,634	0.87	58,680	1.22	53,179	1.08
Deposit-taking institutions	**5,695**	**0.88**	6,522	0.09	6,494	0.63	5,987	1.80	5,985	1.45
Other deposits	**180,307**	**1.28**	161,373	0.68	137,253	1.26	119,793	2.06	108,012	1.66
	258,929	**1.10**	236,229	0.58	207,381	1.12	184,460	1.79	167,176	1.47
Subordinated debt	**960**	**3.70**	758	3.22	759	3.25	758	3.25	564	3.20
Obligations other than deposits[3]	**81,659**	**1.13**	80,808	0.67	70,973	1.12	67,638	1.67	67,220	1.57
Average interest-bearing liabilities[1]	**341,548**	**1.25**	317,795	0.69	279,113	1.19	252,856	1.81	234,960	1.57
Other liabilities	**30,209**		28,195		23,400		18,593		17,034	
Equity[2]	**22,090**		17,516		15,574		14,713		13,946	
	393,847	**1.09**	363,506	0.61	318,087	1.04	286,162	1.60	265,940	1.34
Net interest margin[4]		**1.34**		1.32		1.34		1.26		1.27

(1) See the Glossary section on pages 122 to 125 for details on the composition of these measures.
(2) The amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements (for additional information, see Note 1 to the consolidated financial statements), except for the fiscal 2019 and 2018 figures.
(3) Average obligations other than deposits represent the average of the daily balances for the fiscal year of obligations related to securities sold short, obligations related to securities sold under repurchase agreements and securities loaned, and liabilities related to transferred receivables.
(4) Calculated by dividing net interest income by average assets.

Table 9 – Distribution of Gross Loans and Acceptances by Borrower Category Under Basel Asset Classes

As at October 31 (millions of Canadian dollars)	2022		2021		2020		2019		2018	
	$	%	$	%	$	%	$	%	$	%
Residential mortgage[1]	**95,575**	**46.0**	89,035	48.5	81,543	49.2	74,448	48.4	70,591	48.1
Qualifying revolving retail	**3,801**	**1.8**	3,589	2.0	3,599	2.2	4,099	2.7	4,211	2.9
Other retail	**14,899**	**7.2**	12,949	7.0	11,569	7.0	11,606	7.5	12,246	8.3
Agriculture	**8,109**	**3.9**	7,357	4.0	6,696	4.0	6,308	4.1	5,759	3.9
Oil and gas[2]	**1,435**	**0.7**	1,807	1.0	2,506	1.5	2,742	1.8	2,506	1.7
Mining	**1,049**	**0.5**	529	0.3	756	0.5	758	0.5	1,032	0.7
Utilities[2]	**9,682**	**4.6**	7,687	4.2	6,640	4.0	4,713	3.0	4,033	2.7
Non-real-estate construction[3]	**1,935**	**0.9**	1,541	0.8	1,079	0.7	1,168	0.8	1,006	0.7
Manufacturing[2]	**7,374**	**3.6**	5,720	3.1	5,803	3.5	6,549	4.3	5,535	3.8
Wholesale	**3,241**	**1.6**	2,598	1.4	2,206	1.3	2,221	1.4	2,163	1.5
Retail	**3,494**	**1.7**	2,978	1.6	2,955	1.8	3,289	2.1	3,069	2.1
Transportation	**2,209**	**1.1**	1,811	1.0	1,528	0.9	1,682	1.1	1,452	1.0
Communications	**1,830**	**0.9**	1,441	0.8	1,184	0.7	1,601	1.0	1,597	1.1
Financial services[2]	**10,777**	**5.2**	8,870	4.8	7,476	4.4	6,115	3.9	5,482	3.7
Real estate and real-estate-construction[4]	**22,382**	**10.8**	18,195	9.9	14,171	8.6	11,635	7.6	11,671	8.0
Professional services	**2,338**	**1.1**	1,872	1.0	1,490	0.9	1,845	1.2	1,582	1.1
Education and health care	**3,412**	**1.6**	4,073	2.2	3,800	2.3	3,520	2.3	3,284	2.2
Other services	**6,247**	**3.0**	5,875	3.2	5,296	3.2	4,937	3.2	4,715	3.2
Government	**1,661**	**0.8**	1,159	0.6	1,160	0.7	1,071	0.7	1,445	1.0
Other[2]	**5,790**	**2.8**	4,137	2.3	3,586	2.1	2,456	1.6	1,785	1.2
POCI loans	**459**	**0.2**	464	0.3	855	0.5	1,166	0.8	1,576	1.1
	207,699	**100.0**	183,687	100.0	165,898	100.0	153,929	100.0	146,740	100.0

(1) Includes residential mortgage loans on one- to four-unit dwellings (Basel definition) and home equity lines of credit.
(2) In fiscal 2022, the presentation was changed to better align borrower categories with their definitions. Comparative figures have been reclassified.
(3) Includes civil engineering loans, public-private partnership loans, and project finance loans.
(4) Includes residential mortgages on dwellings of five or more units and SME loans.

Table 10 – Impaired Loans

As at October 31 (millions of Canadian dollars)	2022	2021	2020	2019	2018
Gross impaired loans					
Personal Banking	176	169	287	256	266
Commercial Banking[1]	206	244	333	294	231
Wealth Management	21	23	8	5	5
Financial Markets[1]	167	162	134	93	92
USSF&I	242	64	55	36	36
Gross impaired loans excluding POCI loans[2]	812	662	817	684	630
Gross POCI loans	459	464	855	1,166	1,576
	1,271	1,126	1,672	1,850	2,206
Net impaired loans[3]					
Personal Banking	104	106	206	187	199
Commercial Banking[1]	89	107	184	192	139
Wealth Management	15	16	2	3	3
Financial Markets[1]	91	14	43	53	48
USSF&I	180	40	30	15	15
Net impaired loans excluding POCI loans[2]	479	283	465	450	404
Net POCI loans	551	553	921	1,223	1,642
	1,030	836	1,386	1,673	2,046
Allowances for credit losses on impaired loans excluding POCI loans[2]	333	379	352	234	226
Allowances for credit losses on POCI loans	(92)	(89)	(66)	(57)	(66)
Allowances for credit losses on impaired loans	241	290	286	177	160
Provisioning rate excluding POCI loans[2]	41.0 %	57.3 %	43.1 %	34.2 %	35.9 %
Gross impaired loans excluding POCI loans as a % of total loans and acceptances[2]	0.39 %	0.36 %	0.49 %	0.45 %	0.43 %
Net impaired loans excluding POCI loans as a % of total loans and acceptances[2]	0.23 %	0.15 %	0.28 %	0.29 %	0.28 %

(1) For fiscal years prior to 2022, certain amounts have been reclassified to reflect a transfer of the loan portfolio of borrowers in the "Oil and gas" and "Pipelines" sectors from the Personal and Commercial segment to the Financial Markets segment.
(2) See the Glossary section on pages 122 to 125 for details on the composition of these measures.
(3) Net impaired loans are presented net of allowances for credit losses on Stage 3 loan amounts drawn and on POCI loans.

Table 11 – Allowances for Credit Losses

Year ended October 31 (millions of Canadian dollars)	2022	2021	2020	2019	2018
Balance at beginning	**1,169**	1,343	755	714	735
Provisions for credit losses	**145**	2	846	347	327
Write-offs	**(233)**	(192)	(294)	(351)	(367)
Disposals	**–**	(14)	–	(1)	(24)
Recoveries	**40**	44	44	52	45
Exchange and other movements	**10**	(14)	(8)	(6)	(2)
Balance at end	**1,131**	1,169	1,343	755	714
Composition of allowances:					
Allowances for credit losses on impaired loans excluding POCI loans[1]	**333**	379	352	234	226
Allowances for credit losses on POCI loans	**(92)**	(89)	(66)	(57)	(66)
Allowances for credit losses on non-impaired loans	**714**	708	872	501	498
Allowances for credit losses on off-balance-sheet commitments and other assets	**176**	171	185	77	56

(1) See the Glossary section on pages 122 to 125 for details on the composition of these measures.

Table 12 – Deposits

As at October 31 (millions of Canadian dollars)	2022		2021		2020		2019		2018	
	$	**%**	$	%	$	%	$	%	$	%
Personal	**78,811**	**29.6**	70,076	29.1	67,499	31.3	60,065	31.7	55,688	32.6
Business and government	**184,230**	**69.1**	167,870	69.7	143,787	66.6	125,266	66.1	110,321	64.6
Deposit-taking institutions	**3,353**	**1.3**	2,992	1.2	4,592	2.1	4,235	2.2	4,821	2.8
Total	**266,394**	**100.0**	240,938	100.0	215,878	100.0	189,566	100.0	170,830	100.0
Canada	**238,239**	**89.5**	216,906	90.0	195,730	90.7	172,764	91.1	156,054	91.4
United States	**9,147**	**3.4**	9,234	3.8	8,126	3.7	6,907	3.7	6,048	3.5
Other countries	**19,008**	**7.1**	14,798	6.2	12,022	5.6	9,895	5.2	8,728	5.1
Total	**266,394**	**100.0**	240,938	100.0	215,878	100.0	189,566	100.0	170,830	100.0
Personal deposits as a % of total assets		**19.5**		19.7		20.4		21.3		21.2

Glossary

Acceptances
Acceptances and the customers' liability under acceptances constitute a guarantee of payment by a bank and can be traded in the money market. The Bank earns a "stamping fee" for providing this guarantee.

Allowances for credit losses
Allowances for credit losses represent management's unbiased estimate of expected credit losses as at the balance sheet date. These allowances are primarily related to loans and off-balance-sheet items such as loan commitments and financial guarantees.

Assets under administration
Assets in respect of which a financial institution provides administrative services on behalf of the clients who own the assets. Such services include custodial services, collection of investment income, settlement of purchase and sale transactions, and record-keeping. Assets under administration are not reported on the balance sheet of the institution offering such services.

Assets under management
Assets managed by a financial institution and that are beneficially owned by clients. Management services are more comprehensive than administrative services and include selecting investments or offering investment advice. Assets under management, which may also be administered by the financial institution, are not reported on the balance sheet of the institution offering such services.

Available TLAC
Available TLAC includes total capital as well as certain senior unsecured debt subject to the federal government's bail-in regulations that satisfy all of the eligibility criteria in OSFI's *Total Loss Absorbing Capacity (TLAC) Guideline*.

Average interest-bearing assets
Average interest-bearing assets include interest-bearing deposits with financial institutions and certain cash items, securities, securities purchased under reverse repurchase agreements and securities borrowed, and loans, while excluding customers' liability under acceptances and other assets. The average is calculated based on the daily balances for the period.

Average interest-bearing assets, non-trading
Average interest-bearing assets, non-trading, include interest-bearing deposits with financial institutions and certain cash items, securities purchased under reverse repurchase agreements and securities borrowed, and loans, while excluding other assets and assets related to trading activities. The average is calculated based on the daily balances for the period.

Average volumes
Average volumes represent the average of the daily balances for the period of the consolidated balance sheet items.

Basic earnings per share
Basic earnings per share is calculated by dividing net income attributable to common shareholders by the weighted average basic number of common shares outstanding.

Basis point (bps)
Unit of measure equal to one one-hundredth of a percentage point (0.01%).

Book value of a common share
The book value of a common share is calculated by dividing common shareholders' equity by the number of common shares on a given date.

Common Equity Tier 1 (CET1) capital ratio
Common Equity CET1 capital consists of common shareholders' equity less goodwill, intangible assets, and other capital deductions. The CET1 capital ratio is calculated by dividing total CET1 capital by the corresponding risk-weighted assets.

Compound annual growth rate (CAGR)
CAGR is a rate of growth that shows, for a period exceeding one year, the annual change as though the growth had been constant throughout the period.

Derivative financial instruments
Derivative financial instruments are financial contracts whose value is derived from an underlying interest rate, exchange rate or equity, commodity or credit instrument or index. Examples of derivatives include swaps, options, forward rate agreements, and futures. The notional amount of the derivative is the contract amount used as a reference point to calculate the payments to be exchanged between the two parties, and the notional amount itself is generally not exchanged by the parties.

Diluted earnings per share
Diluted earnings per share is calculated by dividing net income attributable to common shareholders by the weighted average number of common shares outstanding after taking into account the dilution effect of stock options using the treasury stock method and any gain (loss) on the redemption of preferred shares.

Dividend payout ratio
The dividend payout ratio represents the dividends of common shares (per share amount) expressed as a percentage of basic earnings per share.

Economic capital
Economic capital is the internal measure used by the Bank to determine the capital required for its solvency and to pursue its business operations. Economic capital takes into consideration the credit, market, operational, business and other risks to which the Bank is exposed as well as the risk diversification effect among them and among the business segments. Economic capital thus helps the Bank to determine the capital required to protect itself against such risks and ensure its long-term viability.

Efficiency ratio
The efficiency ratio represents non-interest expenses expressed as a percentage of total revenues. It measures the efficiency of the Bank's operations.

Fair value
The fair value of a financial instrument is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction in the principal market at the measurement date under current market conditions (i.e., an exit price).

Gross impaired loans as a percentage of total loans and acceptances
This measure represents gross impaired loans expressed as a percentage of the balance of loans and acceptances.

Gross impaired loans excluding POCI loans
Gross impaired loans excluding POCI loans are all loans classified in Stage 3 of the expected credit loss model excluding POCI loans.

Gross impaired loans excluding POCI loans as a percentage of total loans and acceptances
This measure represents gross impaired loans excluding POCI loans expressed as a percentage of the balance of loans and acceptances.

Hedging
The purpose of a hedging transaction is to modify the Bank's exposure to one or more risks by creating an offset between changes in the fair value of, or the cash flows attributable to, the hedged item and the hedging instrument.

Impaired Loans
The Bank considers a financial asset, other than a credit card receivable, to be credit-impaired when one or more events that have a detrimental impact on the estimated future cash flows of the financial asset have occurred or when contractual payments are 90 days past due. Credit card receivables are considered credit-impaired and are fully written off at the earlier of the following dates: when a notice of bankruptcy is received, a settlement proposal is made, or contractual payments are 180 days past due.

Leverage ratio
The leverage ratio is calculated by dividing Tier 1 capital by total exposure. Total exposure is defined as the sum of on-balance-sheet assets (including derivative financial instruments exposures and securities financing transaction exposures) and off-balance-sheet items.

Liquidity coverage ratio (LCR)
The LCR is a measure designed to ensure that the Bank has sufficient high-quality liquid assets to cover net cash outflows given a severe, 30-day liquidity crisis.

Loans and acceptances
Loans and acceptances represent the sum of loans and of the customers' liability under acceptances.

Loan-to-value ratio
The loan-to-value ratio is calculated according to the total facility amount for residential mortgages and home equity lines of credit divided by the value of the related residential property.

Master netting agreement
Legal agreement between two parties that have multiple derivative contracts with each other that provides for the net settlement of all contracts through a single payment, in the event of default, insolvency or bankruptcy.

Net impaired loans
Net impaired loans are gross impaired loans presented net of allowances for credit losses on Stage 3 loan amounts drawn.

Net impaired loans as a percentage of total loans and acceptances
This measure represents net impaired loans as a percentage of the balance of loans and acceptances.

Net impaired loans excluding POCI loans
Net impaired loans excluding POCI loans are gross impaired loans excluding POCI loans presented net of allowances for credit losses on amounts drawn on Stage 3 loans granted by the Bank.

Net interest income from trading activities
Net interest income from trading activities comprises dividends related to financial assets and liabilities associated with trading activities, net of interest expenses and interest income related to the financing of these financial assets and liabilities.

Net interest income, non-trading
Net interest income, non-trading, comprises revenues related to financial assets and liabilities associated with non-trading activities, net of interest expenses and interest income related to the financing of these financial assets and liabilities.

Net interest margin
Net interest margin is calculated by dividing net interest income by average interest-bearing assets.

Net stable funding ratio (NSFR)
The NSFR ratio is a measure that helps guarantee that a bank is maintaining a stable funding profile to reduce the risk of funding stress.

Net write-offs as a percentage of average loans and acceptances
This measure represents the net write-offs (net of recoveries) expressed as a percentage of average loans and acceptances.

Non-interest income related to trading activities
Non-interest income related to trading activities consists of realized and unrealized gains and losses as well as interest income on securities measured at fair value through profit or loss, income from held-for-trading derivative financial instruments, changes in the fair value of loans at fair value through profit or loss, changes in the fair value of financial instruments designated at fair value through profit or loss, certain commission income, other trading activity revenues, and any applicable transaction costs.

Office of the Superintendent of Financial Institutions (Canada) (OSFI)
The mandate of OSFI is to regulate and supervise financial institutions and private pension plans subject to federal oversight, to help minimize undue losses to depositors and policyholders and, thereby, to contribute to public confidence in the Canadian financial system.

Operating leverage
Operating leverage is the difference between the growth rate for total revenues and the growth rate for non-interest expenses.

Provisioning rate
This measure represents the allowances for credit losses on impaired loans expressed as a percentage of gross impaired loans.

Provisioning rate excluding POCI loans
This measure represents the allowances for credit losses on impaired loans excluding POCI loans expressed as a percentage of gross impaired loans excluding POCI loans.

Provisions for credit losses
Amount charged to income necessary to bring the allowances for credit losses to a level deemed appropriate by management and is comprised of provisions for credit losses on impaired and non-impaired financial assets.

Provisions for credit losses as a percentage of average loans and acceptances
This measure represents the provisions for credit losses expressed as a percentage of average loans and acceptances.

Provisions for credit losses on impaired loans excluding POCI loans as a percentage of average loans and acceptances or provisions for credit losses on impaired loans excluding POCI loans ratio
This measure represents the provisions for credit losses on impaired loans excluding POCI loans expressed as a percentage of average loans and acceptances.

Provisions for credit losses on impaired loans as a percentage of average loans and acceptances
This measure represents the provisions for credit losses on impaired loans expressed as a percentage of average loans and acceptances.

Return on average assets
Return on average assets represents net income expressed as a percentage of average assets.

Return on common shareholders' equity (ROE)
ROE represents net income attributable to common shareholders expressed as a percentage of average equity attributable to common shareholders. It is a general measure of the Bank's efficiency in using equity.

Risk-weighted assets
Assets are risk weighted according to the guidelines established by the Office of the Superintendent of Financial Institutions (Canada). In the Standardized calculation approach, risk factors are applied to the face value of certain assets in order to reflect comparable risk levels. In the Advanced Internal Ratings-Based (AIRB) Approach, risk-weighted assets are derived from the Bank's internal models, which represent the Bank's own assessment of the risks it incurs. Off-balance-sheet instruments are converted to balance sheet (or credit) equivalents by adjusting the notional values before applying the appropriate risk-weighting factors.

Securities purchased under reverse repurchase agreements
Securities purchased by the Bank from a client pursuant to an agreement under which the securities will be resold to the same client on a specified date and at a specified price. Such an agreement is a form of short-term collateralized lending.

Securities sold under repurchase agreements
Financial obligations related to securities sold pursuant to an agreement under which the securities will be repurchased on a specified date and at a specified price. Such an agreement is a form of short-term funding.

Stressed VaR (SVaR)
SVaR is a statistical measure of risk that replicates the VaR calculation method but uses, instead of a two-year history of risk factor changes, a 12-month data period corresponding to a continuous period of significant financial stress that is relevant in terms of the Bank's portfolios.

Structured entity
A structured entity is an entity created to accomplish a narrow and well-defined objective and is designed so that voting or similar rights are not the dominant factor in deciding who controls the entity, such as when any voting rights relate solely to administrative tasks and the relevant activities are directed by means of contractual arrangements.

Taxable equivalent
Taxable equivalent basis is a calculation method that consists in grossing up certain tax-exempt income (particularly dividends) by the amount of income tax that would have otherwise been payable. The Bank uses the taxable equivalent basis to calculate net interest income, non-interest income and income taxes.

Tier 1 capital ratio
Tier 1 capital ratio consists of Common Equity Tier 1 capital and Additional Tier 1 instruments, namely, qualifying non-cumulative preferred shares and the eligible amount of innovative instruments. Tier 1 capital ratio is calculated by dividing Tier 1 capital, less regulatory adjustments, by the corresponding risk-weighted assets.

TLAC leverage ratio
The TLAC leverage ratio is an independent risk measure that is calculated by dividing available TLAC by total exposure, as set out in OSFI's *Total Loss Absorbing Capacity (TLAC) Guideline.*

TLAC ratio
The TLAC ratio is a measure used to assess whether a non-viable Domestic Systemically Important Bank (D-SIB) has sufficient loss-absorbing capacity to support its recapitalization. It is calculated by dividing available TLAC by risk weighted assets, as set out in OSFI's *Total Loss Absorbing Capacity (TLAC) Guideline*.

Total capital ratio
Total capital is the sum of Tier 1 and Tier 2 capital. Tier 2 capital consists of the eligible portion of subordinated debt and certain allowances for credit losses. The Total capital ratio is calculated by dividing total capital, less regulatory adjustments, by the corresponding risk-weighted assets.

Total shareholder return (TSR)
TSR represents the average total return on an investment in the Bank's common shares. The return includes changes in share price and assumes that the dividends received were reinvested in additional common shares of the Bank.

Trading activity revenues
Trading activity revenues consist of the net interest income and the non-interest income related to trading activities. Net interest income comprises dividends related to financial assets and liabilities associated with trading activities, net of interest expenses and interest income related to the financing of these financial assets and liabilities. Non-interest income consists of realized and unrealized gains and losses as well as interest income on securities measured at fair value through profit or loss, income from held-for-trading derivative financial instruments, changes in the fair value of loans at fair value through profit or loss, changes in the fair value of financial instruments designated at fair value through profit or loss, certain commission income, other trading activity revenues, and any applicable transaction costs.

Value-at-Risk (VaR)
VaR is a statistical measure of risk that is used to quantify market risks across products, per types of risks, and aggregate risk on a portfolio basis. VaR is defined as the maximum loss at a specific confidence level over a certain horizon under normal market conditions. The VaR method has the advantage of providing a uniform measurement of financial-instrument-related market risks based on a single statistical confidence level and time horizon.

Audited Consolidated Financial Statements

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Management's Responsibility for Financial Reporting

The consolidated financial statements of National Bank of Canada (the Bank) have been prepared in accordance with section 308(4) of the *Bank Act* (Canada), which states that, except as otherwise specified by the Office of the Superintendent of Financial Institutions (Canada) (OSFI), the financial statements are to be prepared in accordance with International Financial Reporting Standards (IFRS), as issued by the International Accounting Standards Board (IASB). IFRS represent Canadian generally accepted accounting principles (GAAP). None of the OSFI accounting requirements are exceptions to IFRS.

Management maintains the accounting and internal control systems needed to discharge its responsibility, which is to provide reasonable assurance that the financial accounts are accurate and complete and that the Bank's assets are adequately safeguarded. Controls that are currently in place include quality standards on staff hiring and training; the implementation of organizational structures with clear divisions of responsibility and accountability for performance; the *Code of Professional Conduct*; and the communication of operating policies and procedures.

As Chief Executive Officer and as Chief Financial Officer, we have overseen the evaluation of the design and operation of the Bank's internal control over financial reporting in accordance with *National Instrument 52-109 Certification of Disclosure in Issuers' Annual and Interim Filings* released by the Canadian Securities Administrators. Based on the evaluation work performed, we have concluded that the internal control over financial reporting and the disclosure controls and procedures were effective as at October 31, 2022 and that they provide reasonable assurance that the Bank's financial information is reliable and that its consolidated financial statements have been prepared in accordance with IFRS.

The Board of Directors (the Board) is responsible for reviewing and approving the financial information contained in the *Annual Report*. Acting through the Audit Committee, the Board also oversees the presentation of the consolidated financial statements and ensures that accounting and control systems are maintained. Composed of directors who are neither officers nor employees of the Bank, the Audit Committee is responsible, through Internal Audit, for performing an independent and objective review of the Bank's internal control effectiveness, i.e., governance processes, risk management processes and control measures. Furthermore, the Audit Committee reviews the consolidated financial statements and recommends their approval to the Board.

The control systems are further supported by the presence of the Compliance Service, which exercises independent oversight and evaluation in order to assist managers in effectively managing regulatory compliance risk and to obtain reasonable assurance that the Bank is compliant with regulatory requirements.

Both the Senior Vice-President, Internal Audit and the Senior Vice-President, Chief Compliance Officer and Chief Anti-Money Laundering Officer have a direct functional link to the Chair of the Audit Committee and to the Chair of the Risk Management Committee. They both also have direct access to the President and Chief Executive Officer.

In accordance with the *Bank Act* (Canada), OSFI is mandated to protect the rights and interests of depositors. Accordingly, OSFI examines and enquires into the business and affairs of the Bank, as deemed necessary, to ensure that the provisions of the *Bank Act* (Canada) are being satisfied and that the Bank is in sound financial condition.

The independent auditor, Deloitte LLP, whose report follows, was appointed by the shareholders at the recommendation of the Board. The auditor has full and unrestricted access to the Audit Committee to discuss audit and financial reporting matters.

Laurent Ferreira
President and Chief Executive Officer

Marie Chantal Gingras
Chief Financial Officer and Executive Vice-President, Finance

Montreal, Canada, November 29, 2022

Independent Auditor's Report

To the Shareholders of National Bank of Canada

Opinion
We have audited the consolidated financial statements of National Bank of Canada (the Bank), which comprise the consolidated balance sheets as at October 31, 2022 and 2021, and the consolidated statements of income, the consolidated statements of comprehensive income, the consolidated statements of changes in equity and the consolidated statements of cash flows for the years then ended, and notes to the consolidated financial statements, including a summary of significant accounting policies (collectively referred to as the "financial statements").

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Bank as at October 31, 2022 and 2021, and its financial performance and its cash flows for the years then ended in accordance with International Financial Reporting Standards (IFRS).

Basis for Opinion
We conducted our audit in accordance with Canadian generally accepted auditing standards (Canadian GAAS). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Bank in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key Audit Matters
Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the financial statements for the year ended October 31, 2022. These matters were addressed in the context of our audit of the financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Allowances for Credit Losses — Refer to Notes 1 and 7 to the Financial Statements
Key Audit Matter Description
The allowances for credit losses represent management's estimate of expected credit losses (ECL) on financial assets calculated under the IFRS 9 – *Financial Instruments* ECL framework. The calculation of ECL is based on the probability of default (PD), loss given default (LGD), and exposure at default (EAD) of the underlying assets and represents an unbiased and probability-weighted estimate of losses expected to occur in the future based on forecasts of macroeconomic variables for three scenarios. Lifetime ECL is recorded for financial assets that have experienced significant increases in credit risk (SICR) since initial recognition or that are impaired; otherwise, 12-month ECL is recorded. Given uncertainty surrounding the key inputs used to measure credit losses, the Bank has applied expert credit judgment to adjust the modelled ECL results.

We have identified the allowances for credit losses as a key audit matter due to the inherent complexity of the ECL models used and the significant judgment required by management in relation to the forward-looking nature of some key assumptions, including the impact of a possible recession on the economy. Significant auditor judgment was required in evaluating: (i) the models and methodologies used to measure ECL; (ii) the forecasts of macroeconomic scenarios and their probability weighting; (iii) the determination of SICR; and (iv) the adjustments to the modelled ECL results representing management's expert credit judgment. Auditing the ECL models and the key judgments and assumptions required a high degree of auditor judgment and an increased extent of audit effort, including the involvement of professionals with specialized skills in credit risk and economics.

How the Key Audit Matter Was Addressed in the Audit
Our audit procedures related to the models and the key judgments and assumptions used by management to estimate the ECL included the following, among others:

- With the assistance of professionals with specialized skills in credit risk or economics:
  - For a selection of ECL models, evaluated the appropriateness of the models used to estimate ECL;
  - Evaluated the forecasts of macroeconomic scenarios and their probability weighting by comparing them against independently developed forecasts and publicly available industry data, including the impact of a possible recession;
  - Assessed management's determination of SICR and the appropriateness of the related model's programming;
  - Assessed the adjustments to the modelled ECL results by evaluating management's expert credit judgment.

Income Taxes – Uncertain Tax Positions — Refer to Notes 1 and 24 to the Financial Statements

Key Audit Matter Description

In the normal course of its business, the Bank is involved in a number of transactions for which the tax impacts are uncertain. The Bank accounts for provisions for uncertain tax positions that adequately represent the risk stemming from tax matters under discussion or being audited by tax authorities or from other matters involving uncertainty. These provisions reflect management's best possible estimate of the amounts that may have to be paid based on qualitative assessments of all relevant factors. As disclosed in Note 24, the Bank was reassessed by the tax authorities for additional income taxes and interest in respect of certain Canadian dividends received by the Bank for certain taxation years and may be reassessed for subsequent taxation years in regard to similar activities. The Bank has not recognized any tax liability related to these uncertain tax positions.

We have identified the assessment of the accounting of the uncertain tax positions related to certain Canadian dividends as a key audit matter given the significant judgment made by management when evaluating the probability of acceptance of the Bank's tax positions and when interpreting relevant tax and case law and administrative positions. Auditing these judgments required a high degree of auditor judgment and resulted in an increased extent of audit effort, including the involvement of tax specialists.

How the Key Audit Matter Was Addressed in the Audit

Our audit procedures pertaining to the assessment of the accounting of the uncertain tax positions related to certain Canadian dividends included the following, among others:

- With the assistance of tax specialists, evaluated management's assessment of the probability of acceptance of the Bank's tax positions by assessing:
  - The Bank's interpretations of relevant tax and case law and administrative positions;
  - The correspondence with the relevant tax authorities; and
  - The advice and legal opinions obtained by the Bank's external tax advisors.

Other Information

Management is responsible for the other information. The other information comprises:

- Management's Discussion and Analysis; and
- The information, other than the financial statements and our auditor's report thereon, in the *Annual Report*.

Our opinion on the financial statements does not cover the other information and we do not and will not express any form of assurance conclusion thereon. In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated.

We obtained Management's Discussion and Analysis and the *Annual Report* prior to the date of this auditor's report. If, based on the work we have performed on this other information, we conclude that there is a material misstatement of this other information, we are required to report that fact in this auditor's report. We have nothing to report in this regard.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with IFRS, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Bank's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Bank or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Bank's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian GAAS will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Canadian GAAS, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Bank's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Bank's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Bank to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Bank to express an opinion on the financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, we determine those matters that were of most significance in the audit of the financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

The engagement partner on the audit resulting in this independent auditor's report is Carl Magnan.

/s/ Deloitte LLP[1]

November 29, 2022
Montreal, Quebec

[1] CPA auditor, public accountancy permit No. A121501

Consolidated Balance Sheets

As at October 31		2022	2021[(1)]
Assets			
Cash and deposits with financial institutions		31,870	33,879
Securities	Notes 3, 4 and 6		
At fair value through profit or loss		87,375	84,811
At fair value through other comprehensive income		8,828	9,583
At amortized cost		13,516	11,910
		109,719	106,304
Securities purchased under reverse repurchase agreements and securities borrowed		26,486	7,516
Loans	Note 7		
Residential mortgage		80,129	72,542
Personal		45,323	41,053
Credit card		2,389	2,150
Business and government		73,317	61,106
		201,158	176,851
Customers' liability under acceptances		6,541	6,836
Allowances for credit losses		(955)	(998)
		206,744	182,689
Other			
Derivative financial instruments	Note 16	18,547	16,484
Investments in associates and joint ventures	Note 9	140	225
Premises and equipment	Note 10	1,397	1,216
Goodwill	Note 11	1,519	1,504
Intangible assets	Notes 1 and 11	1,360	1,274
Other assets	Notes 1 and 12	5,958	4,530
		28,921	25,233
		403,740	355,621
Liabilities and equity			
Deposits	Notes 4 and 13	266,394	240,938
Other			
Acceptances		6,541	6,836
Obligations related to securities sold short		21,817	20,266
Obligations related to securities sold under repurchase agreements and securities loaned	Note 8	33,473	17,293
Derivative financial instruments	Note 16	19,632	19,367
Liabilities related to transferred receivables	Notes 4 and 8	26,277	25,170
Other liabilities	Note 14	6,361	6,301
		114,101	95,233
Subordinated debt	Note 15	1,499	768
Equity			
Equity attributable to the Bank's shareholders and holders of other equity instruments	Notes 18 and 22		
Preferred shares and other equity instruments		3,150	2,650
Common shares		3,196	3,160
Contributed surplus		56	47
Retained earnings	Note 1	15,140	12,854
Accumulated other comprehensive income		202	(32)
		21,744	18,679
Non-controlling interests	Note 19	2	3
		21,746	18,682
		403,740	355,621

The accompanying notes are an integral part of these audited consolidated financial statements.

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these audited consolidated financial statements.

Laurent Ferreira
President and Chief Executive Officer

Karen Kinsley
Director

Consolidated Statements of Income

Year ended October 31		2022	2021[1]
Interest income			
Loans		**7,136**	5,460
Securities at fair value through profit or loss		**1,548**	1,092
Securities at fair value through other comprehensive income		**163**	181
Securities at amortized cost		**263**	178
Deposits with financial institutions		**435**	76
		9,545	6,987
Interest expense			
Deposits		**3,291**	1,635
Liabilities related to transferred receivables		**472**	372
Subordinated debt		**28**	17
Other		**483**	180
		4,274	2,204
Net interest income[2]		**5,271**	4,783
Non-interest income			
Underwriting and advisory fees		**324**	415
Securities brokerage commissions		**204**	238
Mutual fund revenues		**587**	563
Investment management and trust service fees		**997**	900
Credit fees		**490**	506
Card revenues		**186**	148
Deposit and payment service charges		**298**	274
Trading revenues (losses)	Note 21	**543**	268
Gains (losses) on non-trading securities, net		**113**	151
Insurance revenues, net		**158**	131
Foreign exchange revenues, other than trading		**211**	202
Share in the net income of associates and joint ventures	Note 9	**28**	23
Other		**242**	325
		4,381	4,144
Total revenues		**9,652**	8,927
Non-interest expenses			
Compensation and employee benefits		**3,284**	3,027
Occupancy		**312**	299
Technology	Notes 1, 10 and 11	**915**	871
Communications		**57**	53
Professional fees		**249**	246
Other		**413**	407
		5,230	4,903
Income before provisions for credit losses and income taxes		**4,422**	4,024
Provisions for credit losses	Note 7	**145**	2
Income before income taxes		**4,277**	4,022
Income taxes	Notes 1 and 24	**894**	882
Net income	Note 1	**3,383**	3,140
Net income attributable to			
Preferred shareholders and holders of other equity instruments		**107**	123
Common shareholders	Note 1	**3,277**	3,017
Bank shareholders and holders of other equity instruments		**3,384**	3,140
Non-controlling interests		**(1)**	–
		3,383	3,140
Earnings per share *(dollars)*	Notes 1 and 25		
Basic		**9.72**	8.95
Diluted		**9.61**	8.85
Dividends per common share *(dollars)*	Note 18	**3.58**	2.84

The accompanying notes are an integral part of these audited consolidated financial statements.

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these audited consolidated financial statements.
(2) *Net interest income* includes dividend income. For additional information, see Note 1 to these audited consolidated financial statements.

Consolidated Statements of Comprehensive Income

Year ended October 31	2022	2021[1]
Net income	**3,383**	3,140
Other comprehensive income, net of income taxes		
Items that may be subsequently reclassified to net income		
Net foreign currency translation adjustments		
Net unrealized foreign currency translation gains (losses) on investments in foreign operations	**471**	(314)
Net foreign currency translation (gains) losses on investments in foreign operations reclassified to net income	**–**	16
Impact of hedging net foreign currency translation gains (losses)	**(138)**	95
	333	(203)
Net change in debt securities at fair value through other comprehensive income		
Net unrealized gains (losses) on debt securities at fair value through other comprehensive income	**(197)**	6
Net (gains) losses on debt securities at fair value through other comprehensive income reclassified to net income	**91**	(34)
Change in allowances for credit losses on debt securities at fair value through other comprehensive income reclassified to net income	**1**	(2)
	(105)	(30)
Net change in cash flow hedges		
Net gains (losses) on derivative financial instruments designated as cash flow hedges	**(25)**	280
Net (gains) losses on designated derivative financial instruments reclassified to net income	**33**	26
	8	306
Share in the other comprehensive income of associates and joint ventures	**(2)**	–
Items that will not be subsequently reclassified to net income		
Remeasurements of pension plans and other post-employment benefit plans	**(126)**	475
Net gains (losses) on equity securities designated at fair value through other comprehensive income	**(27)**	64
Net fair value change attributable to credit risk on financial liabilities designated at fair value through profit or loss	**601**	(12)
	448	527
Total other comprehensive income, net of income taxes	**682**	600
Comprehensive income	**4,065**	3,740
Comprehensive income attributable to		
Bank shareholders and holders of other equity instruments	**4,066**	3,753
Non-controlling interests	**(1)**	(13)
	4,065	3,740

The accompanying notes are an integral part of these audited consolidated financial statements.

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these audited consolidated financial statements.

Consolidated Statements of Comprehensive Income (cont.)

Income Taxes – Other Comprehensive Income

The following table presents the income tax expense or recovery for each component of other comprehensive income.

Year ended October 31	2022	2021
Items that may be subsequently reclassified to net income		
Net foreign currency translation adjustments		
Net unrealized foreign currency translation gains (losses) on investments in foreign operations	(13)	10
Net foreign currency translation (gains) losses on investments in foreign operations reclassified to net income	–	2
Impact of hedging net foreign currency translation gains (losses)	(28)	24
	(41)	36
Net change in debt securities at fair value through other comprehensive income		
Net unrealized gains (losses) on debt securities at fair value through other comprehensive income	(71)	2
Net (gains) losses on debt securities at fair value through other comprehensive income reclassified to net income	32	(12)
Change in allowances for credit losses on debt securities at fair value through other comprehensive income reclassified to net income	–	–
	(39)	(10)
Net change in cash flow hedges		
Net gains (losses) on derivative financial instruments designated as cash flow hedges	(9)	100
Net (gains) losses on designated derivative financial instruments reclassified to net income	12	9
	3	109
Share in the other comprehensive income of associates and joint ventures	–	–
Items that will not be subsequently reclassified to net income		
Remeasurements of pension plans and other post-employment benefit plans	(45)	170
Net gains (losses) on equity securities designated at fair value through other comprehensive income	(10)	24
Net fair value change attributable to credit risk on financial liabilities designated at fair value through profit or loss	216	(5)
	161	189
	84	324

The accompanying notes are an integral part of these audited consolidated financial statements.

Consolidated Statements of Changes in Equity

Year ended October 31		2022	2021[1]
Preferred shares and other equity instruments at beginning	Note 18	2,650	2,950
Issuances of preferred shares and other equity instruments		500	500
Redemptions of preferred shares and other equity instruments for cancellation		–	(800)
Preferred shares and other equity instruments at end		3,150	2,650
Common shares at beginning	Note 18	3,160	3,057
Issuances of common shares pursuant to the Stock Option Plan		61	104
Repurchases of common shares for cancellation		(24)	–
Impact of shares purchased or sold for trading		(1)	(1)
Common shares at end		3,196	3,160
Contributed surplus at beginning		47	47
Stock option expense	Note 22	17	11
Stock options exercised		(7)	(11)
Other		(1)	–
Contributed surplus at end		56	47
Retained earnings at beginning		12,854	10,444
Impact of an accounting policy change as at November 1, 2020	Note 1	–	(137)
Net income attributable to the Bank's shareholders and holders of other equity instruments	Note 1	3,384	3,140
Dividends on preferred shares and distributions on other equity instruments	Note 18	(119)	(131)
Dividends on common shares	Note 18	(1,206)	(958)
Premium paid on common shares repurchased for cancellation	Note 18	(221)	–
Issuance expenses for shares and other equity instruments, net of income taxes		(4)	(4)
Remeasurements of pension plans and other post-employment benefit plans		(126)	475
Net gains (losses) on equity securities designated at fair value through other comprehensive income		(27)	64
Net fair value change attributable to the credit risk on financial liabilities designated at fair value through profit or loss		601	(12)
Impact of a financial liability resulting from put options written to non-controlling interests	Note 14	(8)	(25)
Other		12	(2)
Retained earnings at end		15,140	12,854
Accumulated other comprehensive income at beginning		(32)	(118)
Net foreign currency translation adjustments		333	(190)
Net change in unrealized gains (losses) on debt securities at fair value through other comprehensive income		(105)	(30)
Net change in gains (losses) on cash flow hedges		8	306
Share in the other comprehensive income of associates and joint ventures		(2)	–
Accumulated other comprehensive income at end		202	(32)
Equity attributable to the Bank's shareholders and holders of other equity instruments		21,744	18,679
Non-controlling interests at beginning	Note 19	3	3
Non-controlling interest from the acquisition of Flinks Technology Inc.	Note 31	–	3
Purchase of the non-controlling interest of the Credigy Ltd. subsidiary		–	10
Net income attributable to non-controlling interests		(1)	–
Other comprehensive income attributable to non-controlling interests		–	(13)
Non-controlling interests at end		2	3
Equity		21,746	18,682

Accumulated Other Comprehensive Income

As at October 31	2022	2021
Accumulated other comprehensive income		
Net foreign currency translation adjustments	204	(129)
Net unrealized gains (losses) on debt securities at fair value through other comprehensive income	(34)	71
Net gains (losses) on instruments designated as cash flow hedges	31	23
Share in the other comprehensive income of associates and joint ventures	1	3
	202	(32)

The accompanying notes are an integral part of these audited consolidated financial statements.

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these audited consolidated financial statements.

Consolidated Statements of Cash Flows

Year ended October 31		2022	2021[1]
Cash flows from operating activities			
Net income	Note 1	3,383	3,140
Adjustments for			
Provisions for credit losses		145	2
Depreciation of premises and equipment, including right-of-use assets		202	195
Amortization of intangible assets	Note 1	279	261
Impairment losses on premises and equipment and on intangible assets	Notes 10 and 11	8	16
Gain on remeasurement of the previously held equity interest in Flinks Technology Inc.	Note 31	–	(33)
Remeasurement at fair value of an investment	Note 6	–	30
Deferred taxes	Note 1	110	106
Losses (gains) on sales of non-trading securities, net		(113)	(151)
Share in the net income of associates and joint ventures		(28)	(23)
Stock option expense		17	11
Change in operating assets and liabilities			
Securities at fair value through profit or loss		(2,564)	(6,485)
Securities purchased under reverse repurchase agreements and securities borrowed		(18,970)	6,996
Loans and acceptances, net of securitization		(23,354)	(15,661)
Deposits		25,456	25,060
Obligations related to securities sold short		1,551	3,898
Obligations related to securities sold under repurchase agreements and securities loaned		16,180	(16,566)
Derivative financial instruments, net		(1,798)	3,382
Securitization – Credit cards		(37)	49
Interest and dividends receivable and interest payable		150	(186)
Current tax assets and liabilities		(437)	272
Other items		(2,102)	1,725
		(1,922)	6,038
Cash flows from financing activities			
Issuances of preferred shares and other equity instruments		500	500
Redemptions of preferred shares and other equity instruments for cancellation		–	(800)
Issuances of common shares (including the impact of shares purchased for trading)		53	92
Repurchases of common shares for cancellation		(245)	–
Issuance of subordinated debt		739	–
Purchase of the non-controlling interest of the Credigy Ltd. subsidiary		–	(300)
Investment in the Flinks Technology Inc. subsidiary	Note 31	–	(30)
Issuance expenses for shares and other equity instruments		(4)	(4)
Repayments of lease liabilities		(99)	(96)
Dividends paid on shares and distributions on other equity instruments		(1,325)	(1,101)
		(381)	(1,739)
Cash flows from investing activities			
Acquisition of Flinks Technology Inc.	Note 31	–	(73)
Net change in investments in associates and joint ventures		202	225
Purchases of non-trading securities		(9,307)	(7,348)
Maturities of non-trading securities		2,050	2,500
Sales of non-trading securities		6,269	6,655
Net change in premises and equipment, excluding right-of-use assets		(296)	(217)
Net change in intangible assets	Note 1	(374)	(275)
		(1,456)	1,467
Impact of currency rate movements on cash and cash equivalents		1,750	(1,029)
Increase (decrease) in cash and cash equivalents		(2,009)	4,737
Cash and cash equivalents at beginning		33,879	29,142
Cash and cash equivalents at end[2]		31,870	33,879
Supplementary information about cash flows from operating activities			
Interest paid		3,763	2,261
Interest and dividends received		9,184	6,858
Income taxes paid		1,118	542

The accompanying notes are an integral part of these audited consolidated financial statements.

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these audited consolidated financial statements.

(2) This item is the equivalent of Consolidated Balance Sheet item *Cash and deposits with financial institutions*. It includes an amount of $7.7 billion as at October 31, 2022 ($6.8 billion as at October 31, 2021) for which there are restrictions and of which $5.3 billion ($4.9 billion as at October 31, 2021) represent the balances that the Bank must maintain with central banks, other regulatory agencies, and certain counterparties.

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Note 1 – Basis of Presentation and Summary of Significant Accounting Policies

National Bank of Canada (the Bank) is a financial institution incorporated and domiciled in Canada and whose shares are listed on the Toronto Stock Exchange. Its head office is located at 600 De La Gauchetière Street West in Montreal, Quebec, Canada. The Bank is a chartered bank under Schedule 1 of the *Bank Act* (Canada) and is regulated by the Office of the Superintendent of Financial Institutions (Canada) (OSFI). The Bank offers financial services to individuals, businesses, institutional clients, and governments throughout Canada as well as specialized services at the international level. It operates four business segments: the Personal and Commercial segment, the Wealth Management segment, the Financial Markets segment, and the U.S. Specialty Finance and International (USSF&I) segment. Its full line of services includes banking and investing solutions for individuals and businesses, corporate banking and investment banking services, securities brokerage, insurance, and wealth management.

On November 29, 2022, the Board of Directors (the Board) authorized the publication of the Bank's audited annual consolidated financial statements (the consolidated financial statements) for the year ended October 31, 2022.

Basis of Presentation

The Bank's consolidated financial statements are prepared in accordance with International Financial Reporting Standards (IFRS), as issued by the International Accounting Standards Board (IASB). The financial statements also comply with section 308(4) of the *Bank Act* (Canada), which states that, except as otherwise specified by OSFI, the consolidated financial statements are to be prepared in accordance with IFRS. IFRS represent Canadian generally accepted accounting principles (GAAP). None of the OSFI accounting requirements are exceptions to IFRS. The accounting policies described in the Summary of Significant Accounting Policies section have been applied consistently to all periods presented, except for the change described hereafter in the Accounting Policy Changes section, which were applied retrospectively during the year ended October 31, 2022 as a result of a final agenda decision made by the International Financial Reporting Interpretations Committee (IFRIC) regarding the costs of configuring or customizing a supplier's software application as part of a cloud computing arrangement. To reflect this change in accounting policy, figures from the year ended October 31, 2021 have been adjusted.

Unless otherwise indicated, all amounts are expressed in Canadian dollars, which is the Bank's functional and presentation currency.

Interest Rate Benchmark Reform

The reform of interbank offered rates (IBORs) and other interest rate benchmarks is a global initiative being coordinated and led by central banks and governments around the world, including those in Canada. This reform has been unfolding for several years, with the IASB monitoring developments. To minimize the financial statement impacts arising from replacing current interest rate benchmarks with alternative benchmarks, the IASB amended certain IFRS standards and allowed for some temporary exemptions, notably in the area of hedge accounting.

During fiscal 2022, the Bank transitioned its LIBOR-related (London Interbank Offered Rates) contracts that involve pound sterling (GBP), the euro (EUR), the Japanese yen (JPY), and the Swiss franc (CHF), for which the cessation or loss of representativeness was December 31, 2021. As for USD LIBOR, for which the cessation or loss of representativeness is planned for June 30, 2023, the Bank included rate replacement clauses in contracts negotiated during 2021 and, since January 1, 2022, the Bank has no longer been using USD LIBOR in new contracts except in circumstances compliant with regulatory guidance. On December 16, 2021, the Bank of Canada announced that a white paper published by the Canadian Alternative Reference Rate (CARR) Working Group was recommending that CDOR (Canadian Dollar Offered Rate) be declared unrepresentative by its administrator, namely, Refinitiv Benchmark Services (UK) Limited (Refinitiv) and that CDOR cease to exist as of June 30, 2024 (including a recommendation to cease using CDOR on the derivative financial instrument market as of June 30, 2023).

On January 31, 2022, Refinitiv launched a public consultation on the future of CDOR. The consultation ended on March 2, 2022, after which Refinitiv published an update to the consultation on April 14, 2022. On May 16, 2022, Refinitiv published the consultation conclusions and announced that the publication of CDOR would cease as of June 28, 2024. Following this announcement, the CARR Working Group welcomed Refinitiv's decision and, at the same time, OSFI published its prudential expectations regarding the cessation of CDOR. First, OSFI expects all new derivative contracts and securities to transition to alternative reference rates by June 30, 2023, with no new CDOR exposure being recorded after that date, with limited exceptions for risk mitigation requirements. Thereafter, by June 28, 2024, OSFI expects federally regulated financial institutions to have transitioned all loan agreements referencing CDOR to alternative reference rates.

To prepare for the interest rate benchmark reform, the Bank developed an enterprise-wide project, put together a dedicated team of experts, established a formal governance structure, and prepared a training plan, and several committees were created to ensure the success of the project. The project team is made up of qualified resources from various fields of expertise to ensure a comprehensive analysis of all aspects of the changes as well as the financial, legal, operational, and technological impacts. Many of these experts, who have in-depth knowledge of accounting standards and reform-related activities, are involved in various working groups and participate in meetings with OSFI. The project team regularly reports on the project's progress to the project steering committee and the Financial Markets Risk Committee. As at October 31, 2022, the project was progressing according to schedule. The Bank is exposed to several risks, including interest rate risk and operational risk, which arise from non-derivative financial assets, non-derivative financial liabilities, and derivative financial instruments. The project team ensures that risks are mitigated while ensuring a positive experience for its clients. The Bank is taking all necessary steps to identify, measure, and control all of the risks to ensure a smooth transition throughout the interest rate benchmark reform.

The following table discloses the non-derivative financial assets, non-derivative financial liabilities, and derivative financial instruments subject to the interest rate benchmark reform as at October 31, 2022 that have not yet transitioned to alternative benchmark rates.

	As at October 31, 2022	
	CDOR	**USD LIBOR**
	Maturing after June 28, 2024	**Maturing after June 30, 2023**
Non-derivative financial assets[(1)]	13,989	5,565
Non-derivative financial liabilities[(2)]	11,107	36
Notional amount of derivative financial instruments	379,539	175,489

(1) Non-derivative financial assets include the carrying value of securities as well as the outstanding balances on loans and the customers' liability under acceptances.
(2) Non-derivative financial liabilities include the nominal amounts of deposits and subordinated debt as well as the carrying value of acceptances.

Accounting Policy Changes

Cloud Computing Arrangements – Final Agenda Decision by IFRIC
In April 2021, IFRIC issued a final agenda decision on accounting for the costs of configuring or customizing a supplier's software as part of a cloud computing or SaaS (Software as a Service) arrangement. The main conclusion was that, if the incurred configuration or customization costs do not give rise to an intangible asset that is separate from the software or if the services received are distinct from the software, those costs are expensed as incurred. IFRIC decided that the relevant accounting standards (IAS 38 – *Intangible Assets* and IFRS 15 – *Revenue From Contracts With Customers*) contain sufficient guidance and that the conclusions, as indicated in the final agenda decision, are part of the interpretation of IFRS. As such, any change arising from these interpretations must be accounted for as a retrospectively applied accounting policy change in accordance with IAS 8 – *Accounting Policies, Changes in Accounting Estimates and Errors*.

During fiscal 2022, the Bank completed an assessment of the impacts of this change in accounting policy. The change was applied retrospectively and had the following impacts on the consolidated financial statements:

- As at November 1, 2020: A $186 million decrease in *Intangible assets*, a $49 million increase in *Other assets – Deferred tax assets,* and a $137 million decrease in *Retained earnings*;
- As at October 31, 2021: A $50 million decrease in *Intangible assets* and a $13 million increase in *Other assets – Deferred tax assets*;
- For the year ended October 31, 2021: A $50 million increase in *Non-interest expenses – Technology*, a $13 million decrease in *Income taxes*, a $37 million decrease in *Net income* and *Net income attributable to common shareholders*, and a $0.11 decrease in *Earnings per share – Basic and diluted*.

For the year ended October 31, 2022, the impacts of this accounting policy change on the Consolidated Statement of Income consisted of a $10 million increase in *Non-interest expenses – Technology* and a $3 million decrease in *Income taxes*.

Note 1 – Basis of Presentation and Summary of Significant Accounting Policies (cont.)

Summary of Significant Accounting Policies

Judgments, Estimates and Assumptions

In preparing consolidated financial statements in accordance with IFRS, management must exercise judgment and make estimates and assumptions that affect the reporting date carrying amounts of assets and liabilities, net income, and related information. Furthermore, certain accounting policies require complex judgments and estimates because they apply to matters that are inherently uncertain, in particular accounting policies applicable to the following: the fair value determination of financial instruments, the impairment of financial assets, the impairment of non-financial assets, pension plans and other post-employment benefits, income taxes, provisions, the consolidation of structured entities, and the classification of debt instruments. Descriptions of these judgments and estimates are provided in each of the notes related thereto in the consolidated financial statements. Actual results could therefore differ from these estimates, in which case the impacts are recognized in the consolidated financial statements of future fiscal periods. The accounting policies described in this note provide greater detail about the use of estimates and assumptions and reliance on judgment.

The effects of the COVID-19 pandemic, the geopolitical context, disrupted supply chains, and rising inflation are persisting and creating uncertainty. Therefore, developing reliable estimates and applying judgment continue to be substantially complex. The uncertainty surrounding certain key inputs used in measuring expected credit losses is described in Note 7 to these consolidated financial statements.

Basis of Consolidation

Subsidiaries

These consolidated financial statements include all the assets, liabilities, operating results and cash flows of the Bank and its subsidiaries, after elimination of intercompany transactions and balances. Subsidiaries are entities, including structured entities, controlled by the Bank. A structured entity is an entity created to accomplish a narrow and well-defined objective and is designed so that voting or similar rights are not the dominant factor in deciding who controls the entity, such as when voting rights relate solely to administrative tasks and the relevant activities are directed by means of contractual arrangements.

Management must exercise judgment in determining whether the Bank must consolidate an entity. The Bank controls an entity only if the following three conditions are met:

- it has decision-making authority regarding the entity's relevant activities;
- it has exposure or rights to variable returns from its involvement with the entity;
- it has the ability to use its power to affect the amount of the returns.

When determining decision-making authority, the Bank considers many factors, including the existence and effect of actual and potential voting rights held by the Bank that can be exercised as well as the holding of instruments that are convertible into voting shares. In addition, the Bank must determine whether, as an investor with decision-making rights, it acts as a principal or agent.

Based on these principles, an assessment of control is performed at the inception of a relationship between any entity and the Bank. When performing this assessment, the Bank considers all facts and circumstances, and it must reassess whether it still controls an investee if facts and circumstances indicate that one or more of the three conditions of control have changed.

The Bank consolidates the entities it controls from the date on which control is obtained and ceases to consolidate them from the date control ceases. The Bank uses the acquisition method to account for the acquisition of a subsidiary from a third party on the date control is obtained.

Non-Controlling Interests

Non-controlling interests in subsidiaries represent the equity interests held by third parties in the Bank's subsidiaries and are presented in total *Equity,* separately from *Equity attributable to the Bank's shareholders and holders of other equity instruments.* The non-controlling interests' proportionate shares of the net income and other comprehensive income of the Bank's subsidiaries are presented separately in the Consolidated Statement of Income and in the Consolidated Statement of Comprehensive Income, respectively.

With respect to units issued to third parties by mutual funds and certain other funds that are consolidated, they are presented at fair value in *Other liabilities* on the Consolidated Balance Sheet. Lastly, changes in ownership interests in subsidiaries that do not result in a loss of control are recognized as equity transactions. The difference between the adjustment in the carrying value of the non-controlling interest and the fair value of the consideration paid or received is recognized directly in *Equity attributable to the Bank's shareholders and holders of other equity instruments*.

Investments in Associates and Joint Ventures
The Bank exercises significant influence over an entity when it has the power to participate in the financial and operating policy decisions of the investee. The Bank has joint control when there is a contractually agreed sharing of control of an entity, and joint control exists only when decisions about the relevant activities require the unanimous consent of the parties sharing control.

Investments in associates, i.e., entities over which the Bank exercises significant influence, and investments in joint ventures, i.e., entities over which the Bank has rights to the net assets and exercises joint control, are accounted for using the equity method. Under the equity method, the investment is initially recorded at cost and, following acquisition, the Bank's proportionate shares in the net income and in the other comprehensive income are recognized, respectively, in *Non-interest income* in the Consolidated Statement of Income and in *Other comprehensive income* in the Consolidated Statement of Comprehensive Income. The carrying value of the investment is adjusted by an equivalent amount on the Consolidated Balance Sheet and reduced by distributions received.

Translation of Foreign Currencies
The consolidated financial statements are presented in Canadian dollars, which is the Bank's functional and presentation currency. Each foreign operation within the Bank's scope of consolidation determines its own functional currency, and the items reported in the financial statements of each foreign operation are measured using that currency.

Monetary items and non-monetary items measured at fair value and denominated in foreign currencies are translated into the functional currency at exchange rates prevailing at the Consolidated Balance Sheet date. Non-monetary items not measured at fair value are translated into the functional currency at historical rates. Revenues and expenses denominated in foreign currencies are translated at the average exchange rates for the period. Translation gains and losses are recognized in *Non-interest income* in the Consolidated Statement of Income, except for equity instruments designated at fair value through other comprehensive income, for which unrealized gains and losses are recorded in *Other comprehensive income* and will not be subsequently reclassified to net income.

In the consolidated financial statements, the assets and liabilities of all foreign operations are translated into the Bank's functional currency at the exchange rates prevailing at the Consolidated Balance Sheet date, whereas the revenues and expenses of such foreign operations are translated into the Bank's functional currency at the average exchange rates for the period. Any goodwill resulting from the acquisition of a foreign operation that does not have the same functional currency as the parent company, and any fair value adjustments to the carrying amounts of assets and liabilities resulting from the acquisition, are treated as assets and liabilities of the foreign operation and translated at the exchange rates prevailing at the Consolidated Balance Sheet date. Unrealized translation gains and losses related to foreign operations, including the impact of hedges and income taxes on the related results, are presented in *Other comprehensive income*. Upon disposal of a foreign operation, any accumulated translation gains and losses, along with the related hedges, recorded in the *Accumulated other comprehensive income* item of this foreign operation, are reclassified to *Non-interest income* in the Consolidated Statement of Income.

Classification and Measurement of Financial Instruments
At initial recognition, all financial instruments are recorded at fair value on the Consolidated Balance Sheet. At initial recognition, financial assets must be classified as subsequently measured at fair value through other comprehensive income, at amortized cost, or at fair value through profit or loss. The Bank determines the classification based on the contractual cash flow characteristics of the financial assets and on the business model it uses to manage these financial assets. At initial recognition, financial liabilities are classified as subsequently measured at amortized cost or as at fair value through profit or loss.

For the purpose of classifying a financial asset, the Bank must determine whether the contractual cash flows associated with the financial asset are solely payments of principal and interest on the principal amount outstanding. The principal is generally the fair value of the financial asset at initial recognition. The interest consists of consideration for the time value of money, for the credit risk associated with the principal amount outstanding during a particular period, and for other basic lending risks and costs as well as of a profit margin. If the Bank determines that the contractual cash flows associated with a financial asset are not solely payments of principal and interest, the financial assets must be classified as measured at fair value through profit or loss.

When classifying financial assets, the Bank determines the business model used for each portfolio of financial assets that are managed together to achieve a same business objective. The business model reflects how the Bank manages its financial assets and the extent to which the financial asset cash flows are generated by the collection of the contractual cash flows, the sale of the financial assets, or both. The Bank determines the business model using scenarios that it reasonably expects to occur. Consequently, the business model determination is a matter of fact and requires the use of judgment and consideration of all the relevant evidence available to the Bank at the date of determination.

Note 1 – Basis of Presentation and Summary of Significant Accounting Policies (cont.)

A financial asset portfolio falls within a "hold to collect" business model when the Bank's primary objective is to hold these financial assets in order to collect contractual cash flows from them and not to sell them. When the Bank's objective is achieved both by collecting contractual cash flows and by selling the financial assets, the financial asset portfolio falls within a "hold to collect and sell" business model. In this type of business model, collecting contractual cash flows and selling financial assets are both integral components to achieving the Bank's objective for this financial asset portfolio. Financial assets are mandatorily measured at fair value through profit or loss if they do not fall within either a "hold to collect" business model or a "hold to collect and sell" business model.

Financial Instruments Designated at Fair Value Through Profit or Loss

A financial asset may be irrevocably designated at fair value through profit or loss at initial recognition if certain conditions are met. The Bank may apply this option if, consistent with a documented risk management strategy, doing so eliminates or significantly reduces a measurement or recognition inconsistency that would otherwise arise from measuring financial assets or liabilities or recognizing gains and losses on them on different bases, and if the fair values are reliable. Financial assets thus designated are recognized at fair value, and any change in fair value is recorded in *Non-interest income* in the Consolidated Statement of Income. Interest income arising from these financial instruments designated at fair value through profit or loss is recorded in *Net interest income* in the Consolidated Statement of Income.

A financial liability may be irrevocably designated at fair value through profit or loss when it is initially recognized. Financial liabilities thus designated are recognized at fair value, and any changes in fair value attributable to changes in the Bank's own credit risk are recognized in *Other comprehensive income* unless these changes create or enlarge an accounting mismatch in *Net income.* Fair value changes not attributable to the Bank's own credit risk are recognized in *Non-interest income* in the Consolidated Statement of Income. The amounts recognized in *Other comprehensive income* will not be subsequently reclassified to *Net income*. Interest expense arising from these financial liabilities designated at fair value through profit or loss is recorded in the *Net interest income* item of the Consolidated Statement of Income. The Bank may use this option in the following cases:

- if, consistent with a documented risk management strategy, using this option allows the Bank to eliminate or significantly reduce a measurement or recognition inconsistency that would otherwise arise from measuring financial assets or liabilities on different bases, and if the fair values are reliable;
- if a group of financial assets and financial liabilities to which an instrument belongs is managed and its performance is evaluated on a fair value basis, in accordance with the Bank's documented risk management or investment strategy, and information is provided on that basis to senior management. Consequently, the Bank may use this option if it has implemented a documented risk management strategy to manage a group of financial instruments together on the fair value basis, if it can demonstrate that significant financial risks are eliminated or significantly reduced, and if the fair values are reliable;
- for hybrid financial instruments with one or more embedded derivatives that would significantly modify the cash flows of the financial instruments and that would otherwise be bifurcated and accounted for separately.

Financial Instruments Designated at Fair Value Through Other Comprehensive Income

At initial recognition, an investment in an equity instrument that is neither held for trading nor a contingent consideration recognized in a business combination may be irrevocably designated as being at fair value through other comprehensive income. In accordance with this designation, any change in fair value is recognized in *Other comprehensive income* with no subsequent reclassification to net income. Dividend income is recorded in *Interest income* in the Consolidated Statement of Income.

Securities Measured at Fair Value Through Other Comprehensive Income

Securities measured at fair value through other comprehensive income include: (i) debt securities for which the contractual terms of the financial asset give rise, on specified dates, to cash flows that are solely payments of principal and interest on the principal amount outstanding and that fall within a "hold to collect and sell" business model and (ii) equity securities designated at fair value through other comprehensive income with no subsequent reclassification of gains and losses to net income.

The Bank recognizes securities transactions at fair value through other comprehensive income on the trade date, and the transaction costs are capitalized. Interest income and dividend income are recognized in *Interest income* in the Consolidated Statement of Income.

Debt Securities Measured at Fair Value Through Other Comprehensive Income

Debt securities measured at fair value through other comprehensive income are recognized at fair value. Unrealized gains and losses are recognized, net of expected credit losses and income taxes, and provided that they are not hedged by derivative financial instruments in a fair value hedging relationship, in *Other comprehensive income*. When the securities are sold, realized gains or losses, determined on an average cost basis, are reclassified to *Non-interest income – Gains (losses) on non-trading securities, net* in the Consolidated Statement of Income. Premiums, discounts and related transaction costs are amortized to interest income over the expected life of the instrument using the effective interest rate method.

Equity Securities Designated at Fair Value Through Other Comprehensive Income
Equity securities designated at fair value through other comprehensive income are recognized at fair value. Unrealized gains and losses are presented, net of income taxes, in *Other comprehensive income* with no subsequent reclassification of realized gains and losses to net income. Transaction costs incurred upon the purchase of such equity securities are not reclassified to net income upon the sale of the securities.

Securities Measured at Amortized Cost
Securities measured at amortized cost include debt securities for which the contractual terms give rise, on specified dates, to cash flows that are solely payments of principal and interest on the principal amount outstanding and that fall within a "hold to collect" business model.

The Bank recognizes these securities transactions at fair value on the trade date, and the transaction costs are capitalized. After initial recognition, debt securities in this category are recorded at amortized cost. Interest income is recognized in *Interest income* in the Consolidated Statement of Income. Premiums, discounts and related transaction costs are amortized to interest income over the expected life of the instrument using the effective interest rate method. Securities measured at amortized cost are presented net of allowances for credit losses on the Consolidated Balance Sheet.

Securities Measured at Fair Value Through Profit or Loss
Securities not classified or designated as measured at fair value through other comprehensive income or at amortized cost are classified as measured at fair value through profit or loss.

Securities measured at fair value through profit or loss include (i) securities held for trading, (ii) securities designated at fair value through profit or loss, (iii) all equity securities other than those designated as measured at fair value through other comprehensive income with no subsequent reclassifications of gains and losses to net income, and (iv) debt securities for which the contractual cash flows are not solely payments of principal and any interest on any principal amount outstanding.

The Bank recognizes securities transactions at fair value through profit or loss on the settlement date on the Consolidated Balance Sheet. Changes in fair value between the trade date and the settlement date are recognized in *Non-interest income* in the Consolidated Statement of Income.

Securities at fair value through profit or loss are recognized at fair value. Interest income, any transaction costs, as well as realized and unrealized gains or losses on securities held for trading are recognized in *Non-interest income – Trading revenues (losses)* in the Consolidated Statement of Income. Dividend income is recorded in *Interest income* in the Consolidated Statement of Income. Interest income on securities designated at fair value through profit or loss is recorded in *Interest income* in the Consolidated Statement of Income. Realized and unrealized gains or losses on these securities are recognized in *Non-interest income – Trading revenues (losses)* in the Consolidated Statement of Income.

Realized and unrealized gains or losses on equity securities at fair value through profit or loss, other than those held for trading, as well as debt securities for which the contractual cash flows are not solely payments of principal and interest on the principal amount outstanding, are recognized in *Non-interest income – Gains (losses) on non-trading securities*, *net* in the Consolidated Statement of Income. The dividend income and interest income on these financial assets are recognized in *Interest income* in the Consolidated Statement of Income.

Securities Purchased Under Reverse Repurchase Agreements, Obligations Related to Securities Sold Under Repurchase Agreements, and Securities Borrowed and Loaned
The Bank recognizes these transactions at amortized cost using the effective interest rate method, except when they are designated at fair value through profit or loss and are recorded at fair value. These transactions are held within a business model whose objective is to collect contractual cash flows, i.e., cash flows that are solely payments of principal and interest on the principal amount outstanding. Securities sold under repurchase agreements remain on the Consolidated Balance Sheet, whereas securities purchased under reverse repurchase agreements are not recognized. Reverse repurchase agreements and repurchase agreements are treated as collateralized lending and borrowing transactions.

The Bank also borrows and lends securities. Securities loaned remain on the Consolidated Balance Sheet, while securities borrowed are not recognized. As part of these transactions, the Bank pledges or receives collateral in the form of cash or securities. Collateral pledged in the form of securities remains on the Consolidated Balance Sheet. Collateral received in the form of securities is not recognized on the Consolidated Balance Sheet. Collateral pledged or received in the form of cash is recognized in financial assets or liabilities on the Consolidated Balance Sheet.

When the collateral is pledged or received in the form of cash, the interest income and expense are recorded in *Net interest income* in the Consolidated Statement of Income.

Note 1 – Basis of Presentation and Summary of Significant Accounting Policies (cont.)

Loans

Loans Measured at Amortized Cost

Loans classified as measured at amortized cost include loans originated or purchased by the Bank that are not classified as measured at fair value through profit or loss or designated at fair value through profit or loss. These loans are held within a business model whose objective is to collect contractual cash flows, i.e., cash flows that are solely payments of principal and interest on the principal amount outstanding. All loans originated by the Bank are recognized when cash is advanced to a borrower. Purchased loans are recognized when the cash consideration is paid by the Bank.

All loans are initially recognized at fair value plus directly attributable costs and are subsequently measured at amortized cost using the effective interest rate method, net of allowances for expected credit losses. For purchased performing loans, the acquisition date fair value adjustment on each loan is amortized to interest income over the expected remaining life of the loan using the effective interest rate method. For purchased credit-impaired loans, the acquisition date fair value adjustment on each loan consists of management's estimate of the shortfall of principal and interest cash flows that the Bank expects to collect and of the time value of money. The time value of money component of the fair value adjustment is amortized to interest income over the remaining life of the loan using the effective interest rate method. Loans are presented net of allowances for credit losses on the Consolidated Balance Sheet.

Loans Measured at Fair Value Through Profit or Loss

Loans classified as measured at fair value through profit or loss, loans designated at fair value through profit or loss, and loans for which the contractual cash flows are not solely payments of principal and interest on the principal amount outstanding are recognized at fair value on the Consolidated Balance Sheet. The interest income on loans at fair value through profit or loss is recorded in *Interest income* in the Consolidated Statement of Income.

Changes in the fair value of loans classified as at fair value through profit or loss and loans designated at fair value through profit or loss are recognized in *Non-interest income – Trading revenues (losses)* in the Consolidated Statement of Income. With respect to loans whose contractual cash flows are not solely payments of principal and interest on the principal amount outstanding, changes in fair value are recognized in *Non-interest income – Other* in the Consolidated Statement of Income.

Reclassification of Financial Assets

A financial asset, other than a derivative financial instrument or a financial asset that, at initial recognition, was designated as measured at fair value through profit or loss, is reclassified only in rare situations, i.e., when there is a change in the business model used to manage the financial asset. The reclassification is applied prospectively from the reclassification date.

Establishing Fair Value

The fair value of a financial instrument is the price that would be received to sell a financial asset or paid to transfer a financial liability in an orderly transaction in the principal market at the measurement date under current market conditions (i.e., an exit price).

Unadjusted quoted prices in active markets, based on bid prices for financial assets and offered prices for financial liabilities, provide the best evidence of fair value. A financial instrument is considered quoted in an active market when prices in exchange, dealer, broker or principal-to-principal markets are accessible at the measurement date. An active market is one where transactions occur with sufficient frequency and volume to provide quoted prices on an ongoing basis.

When there is no quoted price in an active market, the Bank uses another valuation technique that maximizes the use of relevant observable inputs and minimizes the use of unobservable inputs. The chosen valuation technique incorporates all the factors that market participants would consider when pricing a transaction. Judgment is required when applying a large number of acceptable valuation techniques and estimates to determine fair value. The estimated fair value reflects market conditions on the valuation date and, consequently, may not be indicative of future fair value.

The best evidence of the fair value of a financial instrument at initial recognition is the transaction price, i.e., the fair value of the consideration received or paid. If there is a difference between the fair value at initial recognition and the transaction price, and the fair value is determined using a valuation technique based on observable market inputs or, in the case of a derivative, if the risks are fully offset by other contracts entered into with third parties, this difference is recognized in the Consolidated Statement of Income. In other cases, the difference between the fair value at initial recognition and the transaction price is deferred on the Consolidated Balance Sheet. The amount of the deferred gain or loss is recognized over the term of the financial instrument. The unamortized balance is immediately recognized in net income when (i) observable market inputs can be obtained and support the fair value of the transaction, (ii) the risks associated with the initial contract are substantially offset by other contracts entered into with third parties, (iii) the gain or loss is realized through a cash receipt or payment, or (iv) the transaction matures or is terminated before maturity.

In certain cases, measurement adjustments are recognized to address factors that market participants would use at the measurement date to determine fair value but that are not included in the measurement techniques due to system limitations or uncertainty surrounding the measure. These factors include, but are not limited to, the unobservable nature of the inputs used in the valuation model, assumptions about risk such as market risk, credit risk, or valuation model risk, and future administration costs. The Bank may also consider market liquidity risk when determining the fair value of financial instruments when it believes these instruments could be disposed of for a consideration that is below the fair value otherwise determined due to a lack of market liquidity or an insufficient volume of transactions in a given market. The measurement adjustments also include the funding valuation adjustment applied to derivative financial instruments to reflect the market implied cost or benefits of funding collateral for uncollateralized or partly collateralized transactions.

As permitted when certain criteria are met, the Bank has elected to determine fair value based on net exposure to credit risk or market risk for certain portfolios of financial instruments, mainly derivative financial instruments.

Impairment of Financial Assets

At the end of each reporting period, the Bank applies a three-stage impairment approach to measure the expected credit losses (ECL) on all debt instruments measured at amortized cost or at fair value through other comprehensive income and on loan commitments and financial guarantees that are not measured at fair value. The ECL model is forward looking. Measurement of ECLs at each reporting period reflects reasonable and supportable information about past events, current conditions, and forecasts of future events and future economic conditions.

Determining the Stage

The ECL three-stage impairment approach is based on the change in the credit quality of financial assets since initial recognition. If, at the reporting date, the credit risk of non-impaired financial instruments has not increased significantly since initial recognition, these financial instruments are classified in Stage 1, and an allowance for credit losses that is measured, at each reporting date, in an amount equal to 12-month expected credit losses, is recorded. When there is a significant increase in credit risk since initial recognition, these non-impaired financial instruments are migrated to Stage 2, and an allowance for credit losses that is measured, at each reporting date, in an amount equal to lifetime expected credit losses, is recorded. In subsequent reporting periods, if the credit risk of a financial instrument improves such that there is no longer a significant increase in credit risk since initial recognition, the ECL model requires reverting to Stage 1, i.e., recognition of 12-month expected credit losses. When one or more events that have a detrimental impact on the estimated future cash flows of a financial asset occurs, the financial asset is considered credit-impaired and is migrated to Stage 3, and an allowance for credit losses equal to lifetime expected credit losses continues to be recorded or the financial asset is written off. Interest income is calculated on the gross carrying amount for financial assets in Stages 1 and 2 and on the net carrying amount for financial assets in Stage 3.

Assessment of Significant Increase in Credit Risk

In determining whether credit risk has increased significantly, the Bank uses an internal credit risk grading system, external risk ratings, and forward-looking information to assess deterioration in the credit quality of a financial instrument. To assess whether or not the credit risk of a financial instrument has increased significantly, the Bank compares the probability of default (PD) occurring over its expected life as at the reporting date with the PD occurring over its expected life on the date of initial recognition and considers reasonable and supportable information indicative of a significant increase in credit risk since initial recognition. The Bank includes relative and absolute thresholds in the definition of significant increase in credit risk and a backstop of 30 days past due. All financial instruments that are 30 days past due are migrated to Stage 2 even if other metrics do not indicate that a significant increase in credit risk has occurred. The assessment of a significant increase in credit risk requires significant judgment.

Measurement of Expected Credit Losses

ECLs are measured as the probability-weighted present value of all expected cash shortfalls over the remaining expected life of the financial instrument, and reasonable and supportable information about past events, current conditions, and forecasts of future events and economic conditions is considered. The estimation and application of forward-looking information requires significant judgment. Cash shortfalls represent the difference between all contractual cash flows owed to the Bank and all cash flows that the Bank expects to receive.

The measurement of ECLs is primarily based on the product of the financial instrument's PD, loss given default (LGD), and exposure at default (EAD). Forward-looking macroeconomic factors such as unemployment rates, housing price indices, interest rates, and gross domestic product (GDP) are incorporated into the risk parameters. The estimate of expected credit losses reflects an unbiased and probability-weighted amount that is determined by evaluating a range of possible outcomes. The Bank incorporates three forward-looking macroeconomic scenarios in its ECL calculation process: a base scenario, an upside scenario, and a downside scenario. Probability weights are assigned to each scenario. The scenarios and probability weights are reassessed quarterly and subject to management review. The Bank applies experienced credit judgment to adjust the modelled ECL results when it becomes evident that known or expected risk factors and information were not considered in the credit risk rating and modelling process.

Note 1 – Basis of Presentation and Summary of Significant Accounting Policies (cont.)

ECLs for all financial instruments are recognized in *Provisions for credit losses* in the Consolidated Statement of Income. In the case of debt instruments measured at fair value through other comprehensive income, ECLs are recognized in *Provisions for credit losses* in the Consolidated Statement of Income, and a corresponding amount is recognized in *Other comprehensive income* with no reduction in the carrying amount of the asset on the Consolidated Balance Sheet. As for debt instruments measured at amortized cost, they are presented net of the related allowances for credit losses on the Consolidated Balance Sheet. Allowances for credit losses for off-balance-sheet credit exposures that are not measured at fair value are included in *Other liabilities* on the Consolidated Balance Sheet.

Purchased or Originated Credit-Impaired Financial Assets

On initial recognition of a financial asset, the Bank determines whether the asset is credit-impaired. For financial assets that are credit-impaired upon purchase or origination, the lifetime expected credit losses are reflected in the initial fair value. In subsequent reporting periods, the Bank recognizes only the cumulative changes in these lifetime ECLs since initial recognition as an allowance for credit losses. The Bank recognizes changes in ECLs in *Provisions for credit losses* in the Consolidated Statement of Income, even if the lifetime ECLs are less than the ECLs that were included in the estimated cash flows on initial recognition.

Definition of Default

The definition of default used by the Bank to measure ECLs and transfer financial instruments between stages is consistent with the definition of default used for internal credit risk management purposes. The Bank considers a financial asset, other than a credit card receivable, to be credit-impaired when one or more events that have a detrimental impact on the estimated future cash flows of the financial asset have occurred or when contractual payments are 90 days past due. Credit card receivables are considered credit-impaired and are fully written off at the earlier of the following dates: when a notice of bankruptcy is received, a settlement proposal is made, or contractual payments are 180 days past due.

Write-Offs

A financial asset and its related allowance for credit losses are normally written off in whole or in part when the Bank considers the probability of recovery to be non-existent and when all guarantees and other remedies available to the Bank have been exhausted or if the borrower is bankrupt or winding up and balances owing are not likely to be recovered.

Derecognition of Financial Assets and Securitization

A financial asset is considered for derecognition when the Bank has transferred contractual rights to receive the cash flows or assumed an obligation to transfer these cash flows to a third party. The Bank derecognizes a financial asset when it considers that substantially all the risks and rewards of ownership of the asset have been transferred or when the contractual rights to the cash flows of the financial asset expire. When the Bank considers that it has retained substantially all the risks and rewards of ownership of the transferred asset, it continues to recognize the financial asset and, if applicable, recognizes a financial liability on the Consolidated Balance Sheet. If, due to a derivative financial instrument, the transfer of a financial asset does not result in derecognition, the derivative financial instrument is not recognized on the Consolidated Balance Sheet.

When the Bank has neither transferred nor retained substantially all the risks and rewards of ownership of the financial asset, it derecognizes the financial asset it no longer controls. Any rights and obligations retained following the asset transfer are recognized separately as an asset or liability. If the Bank retains control of the financial asset, it continues to recognize the asset to the extent of its continuing involvement in that asset, i.e., the extent to which it is exposed to changes in the value of the transferred asset.

To diversify its funding sources, the Bank participates in two Canada Mortgage and Housing Corporation (CMHC) securitization programs: the Mortgage-Backed Securities Program under the *National Housing Act* (Canada) (NHA) and Canada Mortgage Bond (CMB) program. Under the first program, the Bank issues NHA securities backed by insured residential mortgages and, under the second, the Bank sells NHA securities to Canada Housing Trust (CHT). As part of these transactions, the Bank retains substantially all the risks and rewards related to ownership of the mortgage loans sold. Therefore, the insured mortgage loans securitized under the CMB program continue to be recognized in the *Loans* item of the Bank's Consolidated Balance Sheet, and the liabilities for the considerations received from the transfer are recognized in *Liabilities related to transferred receivables* on the Consolidated Balance Sheet. Moreover, insured mortgage loans securitized and retained by the Bank continue to be recognized in *Loans* on the Consolidated Balance Sheet.

Derecognition of Financial Liabilities

A financial liability is derecognized when the obligation is discharged, cancelled, or expires. The difference between the carrying value of the financial liability transferred and the consideration paid is recognized in the Consolidated Statement of Income.

Cash and Deposits With Financial Institutions

Cash and deposits with financial institutions consist of cash and cash equivalents, amounts pledged as collateral as well as amounts placed in escrow. Cash and cash equivalents consist of cash, bank notes, deposits with the Bank of Canada and other financial institutions, including net receivables related to cheques, and other items in the clearing process.

Acceptances and Customers' Liability Under Acceptances
The potential liability of the Bank under acceptances is recorded as a customer commitment liability on the Consolidated Balance Sheet. The Bank's potential recourse vis à vis clients is recorded as an equivalent offsetting asset. Fees are recorded in *Non-interest income* in the Consolidated Statement of Income.

Obligations Related to Securities Sold Short
This financial liability represents the Bank's obligation to deliver the securities it sold but did not own at the time of sale. Obligations related to securities sold short are recorded at fair value and presented as liabilities on the Consolidated Balance Sheet. Realized and unrealized gains and losses are recognized in *Non-interest income* in the Consolidated Statement of Income.

Derivative Financial Instruments
In the normal course of business, the Bank uses derivative financial instruments to meet the needs of its clients, to generate trading activity revenues, and to manage its exposure to interest rate risk, foreign exchange risk, credit risk, and other market risks.

All derivative financial instruments are measured at fair value on the Consolidated Balance Sheet. Derivative financial instruments with a positive fair value are included in assets, whereas derivative financial instruments with a negative fair value are included in liabilities on the Consolidated Balance Sheet. Where there are offsetting financial assets and financial liabilities, the net fair value of certain derivative financial instruments is reported either as an asset or as a liability, depending on the circumstance.

Embedded Derivative Financial Instruments
An embedded derivative is a component of a hybrid contract that also includes a non-derivative host, the effect being that some of the cash flows of the combined instrument vary in a way similar to a stand-alone derivative. An embedded derivative causes some or all of the cash flows that otherwise would be required by the contract to be modified according to a specified interest rate, financial instrument price, commodity price, foreign exchange rate, index of prices or rates, credit rating or credit index, or other variable, provided, in the case of a non-financial variable, that the variable is not specific to one of the parties to the contract.

A derivative embedded in a financial liability is separated from the host contract and treated as a separate derivative if, and only if, the following three conditions are met: the economic characteristics and risks of the embedded derivative are not closely related to those of the host contract, the embedded derivative is a separate instrument that meets the definition of a derivative financial instrument, and the hybrid contract is not measured at fair value through profit or loss.

Embedded derivatives that are separately accounted for are measured at fair value on the Consolidated Balance Sheet, and subsequent changes in fair value are recognized in *Non-interest income* in the Consolidated Statement of Income. In general, all embedded derivatives are presented on a combined basis with the host contract. However, certain embedded derivatives that are separated from the host contract are presented in *Derivative financial instruments* on the Consolidated Balance Sheet.

Held-for-Trading Derivative Financial Instruments
Derivative financial instruments are recognized at fair value, and the realized and unrealized gains and losses (including interest income and expense) are recorded in *Non-interest income* in the Consolidated Statement of Income.

Derivative Financial Instruments Designated as Hedging Instruments
Policy
The purpose of a hedging transaction is to modify the Bank's exposure to one or more risks by creating an offset between changes in the fair value of, or the cash flows attributable to, the hedged item and the hedging instrument. Hedge accounting ensures that offsetting gains, losses, revenues and expenses are recognized in the Consolidated Statement of Income in the same period or periods.

Documenting and Assessing Effectiveness
The Bank designates and formally documents each hedging relationship, at its inception, by detailing the risk management objective and the hedging strategy. The documentation identifies the specific asset, liability, or cash flows being hedged, the related hedging instrument, the nature of the specific risk exposure or exposures being hedged, the intended term of the hedging relationship, and the method for assessing the effectiveness or ineffectiveness of the hedging relationship. At the inception of the hedging relationship, and for every financial reporting period for which the hedge has been designated, the Bank ensures that the hedging relationship is highly effective and consistent with its originally documented risk management objective and strategy. When a hedging relationship meets the hedge accounting requirements, it is designated as either a fair value hedge, a cash flow hedge or a foreign exchange hedge of a net investment in a foreign operation.

Note 1 – Basis of Presentation and Summary of Significant Accounting Policies (cont.)

Interest Rate Benchmark Reform
A hedging relationship is directly affected by interest rate benchmark reform such as Interbank Offered Rates (IBORs) only if the reform gives rise to uncertainties about (a) the interest rate benchmark (contractually or non-contractually specified) designated as a hedged risk; and/or (b) the timing or the amount of the interest-rate-benchmark-based cash flows of the hedged item or of the hedging instrument.

For such hedging relationships, the following temporary exceptions apply during the period of uncertainty:

- when determining whether a forecast transaction is highly probable or expected to occur, it is assumed that the interest rate benchmark on which the hedged cash flows (contractually or non-contractually specified) are based is not altered as a result of interest rate benchmark reform;
- when assessing whether a hedge is expected to be highly effective, it is assumed that the interest rate benchmark on which the hedged cash flows and/or the hedged risk (contractually or non-contractually specified) are based, or the interest rate benchmark on which the cash flows of the hedging instrument are based, is not altered as a result of interest rate benchmark reform;
- a hedge is not required to be discontinued if the actual results of the hedge are outside an effectiveness range of 80% to 125% as a result of interest rate benchmark reform;
- for a hedge of a non-contractually specified benchmark portion of interest rate risk, the requirement that the designated portion be separately identifiable need only be met at the inception of the hedging relationship.

Fair Value Hedges
For fair value hedges, the Bank mainly uses interest rate swaps to hedge changes in the fair value of a hedged item. The carrying amount of the hedged item is adjusted based on the effective portion of the gains or losses attributable to the hedged risk, which are recognized in the Consolidated Statement of Income, as well as the change in the fair value of the hedging instrument. The resulting ineffective portion is recognized in *Non-interest income* in the Consolidated Statement of Income.

The Bank prospectively discontinues hedge accounting if the hedging instrument is sold or expires or if the hedging relationship no longer qualifies for hedge accounting or if the Bank revokes the designation. When the designation is revoked, the hedged item is no longer adjusted to reflect changes in fair value, and the amounts previously recorded as cumulative adjustments with respect to the effective portion of gains and losses attributable to the hedged risk are amortized using the effective interest rate method and recognized in the Consolidated Statement of Income over the remaining useful life of the hedged item. If the hedged item is sold or terminated before maturity, the cumulative adjustments with respect to the effective portion of gains and losses attributable to the hedged risk are immediately recorded in the Consolidated Statement of Income.

Cash Flow Hedges
For cash flow hedges, the Bank mainly uses interest rate swaps and total return swaps to hedge variable cash flows attributable to the hedged risk related to a financial asset or liability (or to a group of financial assets or liabilities). The effective portion of changes in fair value of the hedging instrument is recognized in *Other comprehensive income*, whereas the ineffective portion is recognized in *Non-interest income* in the Consolidated Statement of Income.

The amounts previously recorded in *Accumulated other comprehensive income* are reclassified to the Consolidated Statement of Income of the period or periods during which the cash flows of the hedged item affect the Consolidated Statement of Income. If the hedging instrument is sold or expires or if the hedging relationship no longer qualifies for hedge accounting or if the Bank cancels that designation, then the amounts previously recognized in *Accumulated other comprehensive income* are reclassified to the Consolidated Statement of Income in the period or periods during which the cash flows of the hedged item affect the Consolidated Statement of Income.

Hedges of Net Investments in Foreign Operations
Derivative and non-derivative financial instruments are used to hedge foreign exchange risk related to investments made in foreign operations whose functional currency is not the Canadian dollar. The effective portion of the gains and losses on the hedging instrument is recognized in *Other comprehensive income*, whereas the ineffective portion is recognized in *Non-interest income* in the Consolidated Statement of Income. Upon the total or partial sale of a net investment in a foreign operation, amounts reported in *Accumulated other comprehensive income* are reclassified, in whole or in part, to *Non-interest income* in the Consolidated Statement of Income.

Offsetting of Financial Assets and Liabilities
Financial assets and liabilities are offset, and the net amount is presented on the Consolidated Balance Sheet when the Bank has a legally enforceable right to set off the recognized amounts and intends to settle on a net basis or to realize the asset and settle the liability simultaneously.

Premises and Equipment
Premises and equipment, except for land and the head office building under construction, are recognized at cost less accumulated depreciation and accumulated impairment losses, if any. Land and the head office building under construction are recorded at cost less any accumulated impairment losses. Right-of-use assets are presented in *Premises and equipment* on the Consolidated Balance Sheet. For additional information about the accounting treatment of right-of-use assets, see the Leases section presented below.

Buildings, computer equipment, and equipment and furniture are systematically depreciated over their estimated useful lives. The depreciation period for leasehold improvements is the lesser of the estimated useful life of the leasehold improvements or the non-cancellable period of the lease. Depreciation methods and estimated useful lives are reviewed on an annual basis. The depreciation expense is recorded in *Non-interest expenses* in the Consolidated Statement of Income.

	Method	Useful life
Buildings	5% declining balance	
Computer equipment	Straight-line	3-7 years
Equipment and furniture	Straight-line	8 years
Leasehold improvements	Straight-line	(1)

(1) The depreciation period is the lesser of the estimated useful life or the lease term.

Leases
At the inception date of a contract, the Bank assesses whether the contract is, or contains, a lease. A contract is, or contains, a lease if it conveys the right to control the use of an identified asset for a period of time in exchange for consideration. When the Bank is a lessee, it recognizes a right-of-use asset and a corresponding lease liability at the lease commencement date except for short-term leases (defined as leases with terms of 12 months or less) other than real estate leases and leases for which the underlying asset is of low value. For such leases, the Bank recognizes the lease payments as a non-interest expense on a straight-line basis over the lease term. As a practical expedient, the Bank elected, for real estate leases, not to separate non-lease components from lease components and instead account for them as a single lease component. When the Bank is the lessor, the leased assets remain on the Consolidated Balance Sheet and are reported in *Premises and equipment*, and the rental income is recognized net of related expenses in *Non-interest income* in the Consolidated Statement of Income.

Right-of-use assets are initially measured at cost and subsequently measured at cost less accumulated depreciation and accumulated impairment losses, if any, and adjusted for certain remeasurements of lease liabilities. The cost of a right-of-use asset comprises the amount of the initial measurement of the lease liability, any lease payments made at or before the commencement date, any initial direct costs incurred when entering into the lease, and an estimate of costs to dismantle the asset or restore the site, less any lease incentives received. Right-of-use assets are depreciated on a straight-line basis over the lesser of the lease term and the estimated useful life of the asset. Right-of-use assets are presented in *Premises and equipment* on the Consolidated Balance Sheet. The depreciation expense and impairment losses, if any, are recorded in *Non-interest expenses* in the Consolidated Statement of Income.

The lease liability is initially measured at the present value of future lease payments net of lease incentives not yet received. The present value of lease payments is determined using the Bank's incremental borrowing rate. The lease liability is subsequently measured at amortized cost using the effective interest method. In determining the lease term, the Bank considers all the facts and circumstances that create an economic incentive to exercise an extension option or not to exercise a termination option. The lease term determined by the Bank comprises the non-cancellable period of lease contracts, the periods covered by an option to extend the lease if the Bank is reasonably certain to exercise that option, and the periods covered by an option to terminate the lease if the Bank is reasonably certain not to exercise that option. The Bank reassesses the lease term if a significant event or change in circumstances occurs and that is within its control. The Bank applies judgment to determine the lease term when the lease contains extension and termination options. Lease liabilities are presented in *Other liabilities* on the Consolidated Balance Sheet, and the interest expense is presented in the *Interest expense – Other* item of the Consolidated Statement of Income.

Note 1 – Basis of Presentation and Summary of Significant Accounting Policies (cont.)

Goodwill

The Bank uses the acquisition method to account for business combinations. The consideration transferred in a business combination is measured at the acquisition-date fair value, and the transaction costs related to the acquisition are expensed as incurred. When the Bank acquires control of a business, all of the identifiable assets and liabilities of the acquiree, including intangible assets, are recorded at fair value. The interests previously held in the acquiree are also measured at fair value. Goodwill represents the excess of the purchase consideration and all previously held interests over the fair value of the identifiable net assets of the acquiree. If the fair value of the identifiable net assets exceeds the purchase consideration and all previously held interests, the difference is immediately recognized in income as a gain on a bargain purchase.

Non-controlling interests in the net assets of consolidated subsidiaries are identified separately from the Bank's ownership interest and can be initially measured at either fair value or at the non-controlling interest's proportionate share of the acquiree's identifiable net assets. The measurement basis is selected on a case-by-case basis. Following an acquisition, non-controlling interests consist of the value assigned to those interests at initial recognition plus the non-controlling interests' share of changes in equity since the date of the acquisition.

Intangible Assets

Intangible Assets With Finite Useful Lives

Software that is not part of a cloud computing arrangement and certain other intangible assets are recognized at cost less accumulated amortization and accumulated impairment losses. These intangible assets are systematically amortized on a straight-line basis over their useful lives, which vary between four and ten years. The amortization expense is recorded in *Non-interest expenses* in the Consolidated Statement of Income.

Intangible Assets With Indefinite Useful Lives

The Bank's intangible assets with indefinite useful lives come from the acquisition of subsidiaries or groups of assets and consist of management contracts and a trademark. They are recognized at the acquisition-date fair value. The management contracts are for the management of open-ended funds. At the end of each reporting period, the Bank reviews the useful lives to determine whether facts and circumstances continue to support an indefinite useful life assessment. Intangible assets are deemed to have an indefinite useful life following an examination of all relevant factors, in particular: (a) the contracts do not have contractual maturities; (b) the stability of the business segment to which the intangible assets belong; (c) the Bank's capacity to control the future economic benefits of the intangible assets; and (d) the continued economic benefits generated by the intangible assets.

Impairment of Non-Financial Assets

Premises and equipment and intangible assets with finite useful lives are tested for impairment when events or changes in circumstances indicate that their carrying value may not be recoverable. At the end of each reporting period, the Bank determines whether there is an indication that premises and equipment or intangible assets with finite useful lives may be impaired. Goodwill and intangible assets that are not available for use or that have indefinite useful lives are tested for impairment annually or more frequently if there is an indication that the asset might be impaired.

An asset is tested for impairment by comparing its carrying amount with its recoverable amount. The recoverable amount must be estimated for the individual asset. Where it is not possible to estimate the recoverable amount of an individual asset, the recoverable amount of the cash-generating unit (CGU) to which the asset belongs will be determined. A CGU is the smallest identifiable group of assets that generates cash inflows that are largely independent of the cash inflows from other assets or groups of assets. The Bank uses judgment to identify CGUs.

An asset's recoverable amount is the higher of fair value less costs to sell and the value in use of the asset or CGU. Value in use is the present value of expected future cash flows from the asset or CGU. The recoverable amount of the CGU is determined using valuation models that consider various factors such as projected future cash flows, discount rates, and growth rates. The use of different estimates and assumptions in applying the impairment tests could have a significant impact on income.

Corporate assets, such as the head office building and computer equipment, do not generate cash inflows that are largely independent of the cash inflows generated by other assets or groups of assets. Therefore, the recoverable amount of an individual corporate asset cannot be determined unless management has decided to dispose of the asset. However, if there is an indication that a corporate asset may be impaired, the recoverable amount is determined for the CGU or group of CGUs to which the corporate asset belongs, and that recoverable amount is compared with the carrying amount of this CGU or group of CGUs.

Goodwill is always tested for impairment at the level of a CGU or group of CGUs. For impairment testing purposes, from the acquisition date, goodwill resulting from a business combination must be allocated to the CGU or group of CGUs expected to benefit from the synergies of the business combination. Each CGU or group of CGUs to which goodwill is allocated must represent the lowest level for which the goodwill is monitored internally at the Bank and must not be larger than an operating segment. The allocation of goodwill to a CGU or group of CGUs involves management's judgment. If an impairment loss is to be recognized, the Bank does so by first reducing the carrying amount of goodwill allocated to the CGU or group of CGUs and then reducing the carrying amounts of the other assets of the CGU or group of CGUs in proportion to the carrying amount of each asset in the CGU or group of CGUs.

If the recoverable amount of an asset or a CGU is less than its carrying amount, the carrying amount is reduced to its recoverable amount and an impairment loss is recognized in *Non-interest expenses* in the Consolidated Statement of Income. An impairment loss recognized in prior periods for an asset other than goodwill must be reversed if, and only if, there has been a change in the estimates used to determine the asset's recoverable amount since the last impairment was recognized. If this is the case, the carrying amount of the asset is increased, given that the impairment loss was reversed, but shall not exceed the carrying amount that would have been determined, net of amortization, had no impairment loss been recognized for this asset in previous years.

Provisions

Provisions are liabilities of uncertain timing and amount. A provision is recognized when the Bank has a present obligation (legal or constructive) arising from a past event, when it is probable that an outflow of economic resources will be required to settle the obligation and when the amount of the obligation can be reliably estimated. Provisions are based on the Bank's best estimates of the economic resources required to settle the present obligation, given all relevant risks and uncertainties, and, when it is significant, the effect of the time value of money. Provisions are reviewed at the end of each reporting period. Provisions are presented in *Other liabilities* on the Consolidated Balance Sheet.

Interest Income and Expense

Interest income and expense, except for the interest income on securities classified as at fair value through profit or loss, are recognized in *Net interest income* and calculated using the effective interest rate method.

The effective interest rate is the rate that exactly discounts estimated future cash inflows and outflows through the expected life of a financial asset or financial liability to the gross carrying amount of a financial asset or to the amortized cost of a financial liability. When calculating the effective interest rate, the Bank estimates expected cash flows by considering all the contractual terms of the financial instrument but does not consider expected credit losses. The calculation includes all fees and points paid or received between the parties to the contract that are an integral part of the effective interest rate, transaction costs, and all other premiums or discounts. Interest income is calculated by applying the effective interest rate to the gross carrying amount of a financial asset except for purchased or originated credit-impaired financial assets and financial assets that were not impaired upon their purchase or origination but became impaired thereafter. For purchased or originated credit-impaired financial assets, the Bank applies the credit-adjusted effective interest rate to the amortized cost of the financial asset from initial recognition. The credit-adjusted effective interest rate reflects expected credit losses. As for loans that have subsequently become credit-impaired, interest income is calculated by applying the effective interest rate to the net carrying amount (net of allowances for credit losses) rather than to the carrying amount.

Loan origination fees, including commitment, restructuring, and renegotiation fees, are considered an integral part of the yield earned on the loan. They are deferred and amortized using the effective interest rate method, and the amortization is recognized in *Interest income* over the term of the loan. Direct costs for originating a loan are netted against the loan origination fees. If it is likely that a commitment will result in a loan, commitment fees receive the same accounting treatment, i.e., they are deferred and amortized using the effective interest rate method and the amortization is recognized in *Interest income* over the term of the loan. Otherwise, they are recorded in *Non-interest income* over the term of the commitment.

Loan syndication fees are recorded in *Non-interest income* unless the yield on the loan retained by the Bank is less than that of other comparable lenders involved in the financing. In such cases, an appropriate portion of the fees is deferred and amortized using the effective interest rate method, and the amortization is recognized in *Interest income* over the term of the loan. Certain mortgage loan prepayment fees are recognized in *Interest income* in the Consolidated Statement of Income when earned.

Dividend Income

Dividends from an equity instrument are recognized in *Net interest income* in the Consolidated Statement of Income when the Bank's right to receive payment is established.

Note 1 – Basis of Presentation and Summary of Significant Accounting Policies (cont.)

Fee and Commission Income
Fee and commission income is recognized when, or as, a performance obligation is satisfied, i.e., when control of a promised service is transferred to a customer and in an amount that reflects the consideration that the entity expects to be entitled to receive in exchange for the service. The revenue may therefore be recognized at a point in time, upon completion of the service, or over time as services are provided.

The Bank must also determine whether its performance obligation is to provide the service itself or to arrange for another party to provide the service (in other words, whether the Bank is acting as a principal or agent). A principal may itself satisfy its performance obligation to provide the specified good or service or it may engage another party to satisfy some or all of the performance obligation on its behalf. A principal also has the primary responsibility for fulfilling the promise to provide the good or service to the customer and has discretion in establishing the price for the service. If the Bank is acting as a principal, revenue is recognized on a gross basis in an amount corresponding to the consideration to which the Bank expects to be entitled. If the Bank is acting as an agent, then revenue is recognized net of the service fees and other costs incurred in relation to the commission and fees earned.

Underwriting and Advisory Fees
Underwriting and advisory fees include underwriting fees, financial advisory fees, and loan syndication fees. These fees are mainly earned in the Financial Markets segment and are recognized at a point in time as revenue upon successful completion of the engagement. Financial advisory fees are fees earned for assisting customers with transactions related to mergers and acquisitions and financial restructurings. Loan syndication fees represent fees earned as the agent or lead lender responsible for structuring, arranging, and administering a loan syndication and are recorded in *Non-interest income* unless the yield on the loan retained by the Bank is less than that of other comparable lenders involved in the financing. In such cases, an appropriate portion of the fees is deferred and amortized using the effective interest rate method, and the amortization is recognized in *Interest income* over the term of the loan.

Securities Brokerage Commissions
Securities brokerage commissions are earned in the Wealth Management segment and are recognized when the transaction is executed.

Mutual Fund Revenues
Mutual fund revenues include management fees earned in the Wealth Management segment. Management fees are primarily calculated based on a fund's net asset value and are recorded in the period the services are performed.

Investment Management and Trust Service Fees
Investment management and trust service fees include management fees, trust service fees, and fees for other investment services provided to clients and earned in the Wealth Management segment. Generally, these fees are calculated using the balances of assets under administration and assets under management. Such fees are recognized in the period the service is performed.

Card Revenues
Card revenues are earned in the Personal and Commercial segment and include card fees such as annual and transactional fees as well as interchange fees. Interchange fees are recognized when a card transaction is settled. Card fees are recognized on the transaction date except for annual fees, which are recorded evenly throughout the year. Reward costs are recorded as a reduction to interchange fees.

Credit Fees and Deposit and Payment Service Charges
Credit fees and deposit and payment service charges are earned in the Personal and Commercial, Financial Markets, and U.S. Specialty Finance and International segments. Credit fees include commissions earned by providing services for loan commitments, financial guarantee contracts, bankers' acceptances, and letters of credit and guarantee, and they are generally recognized in income over the period the services are provided. Deposit and payment service charges include fees related to account maintenance activities and transaction-based service charges. Fees related to account maintenance activities are recognized in the period the services are provided, whereas transaction-based service charges are recognized when the transaction is executed.

Insurance Revenues
Insurance contracts, including reinsurance contracts, are arrangements under which one party accepts significant insurance risk by agreeing to compensate the policyholder if a specified uncertain future event was to occur. Gross premiums, net of premiums transferred under reinsurance contracts, are recognized when they become due. Royalties received from reinsurers are recognized when earned. Claims are recognized when received and an amount is estimated as they are being processed. All these amounts are recognized on a net basis in *Non-interest income* in the Consolidated Statement of Income.

Upon recognition of a premium, a reinsurance asset and insurance liability are recognized, respectively, in *Other assets* and in *Other liabilities* on the Consolidated Balance Sheet. Subsequent changes in the carrying values of the reinsurance asset and insurance liability are recognized on a net basis in *Non-interest income* in the Consolidated Statement of Income.

Income Taxes
Income taxes include current taxes and deferred taxes and are recorded in net income except for income taxes generated by items recognized in *Other comprehensive income* or directly in equity.

Current tax is the amount of income tax payable on the taxable income for a period. It is calculated using the enacted or substantively enacted tax rates prevailing on the reporting date, and any adjustments recognized in the period for the current tax of prior periods. Current tax assets and liabilities are offset, and the net balance is presented in either *Other assets* or *Other liabilities* on the Consolidated Balance Sheet when the Bank has a legally enforceable right to set off the recognized amounts and intends to settle on a net basis or to simultaneously realize the asset and settle the liability.

Deferred tax is established based on temporary differences between the carrying values and the tax bases of assets and liabilities, in accordance with enacted or substantively enacted income tax laws and rates that will apply on the date the differences reverse. Deferred tax is not recognized for temporary differences related to the following:

- the initial accounting of goodwill;
- the initial accounting of an asset or liability in a transaction that is not a business combination and that, at the time of the transaction, affects neither accounting income nor taxable income;
- investments in subsidiaries, associates and joint ventures when it is probable that the temporary difference will not reverse in the foreseeable future and that the Bank controls the timing of the reversal of the temporary difference;
- investments in subsidiaries, associates and joint ventures when it is probable that the temporary difference will not reverse in the foreseeable future and that there will not be taxable income to which the temporary difference can be recognized.

Deferred tax assets are tax benefits in the form of deductions that the Bank may claim to reduce its taxable income in future years. At the end of each reporting period, the carrying amount of deferred tax assets is revised, and it is reduced to the extent that it is no longer probable that sufficient taxable income will be available to allow the benefit of the deferred tax asset to be utilized.

Deferred tax assets and liabilities are offset, and the net balance is presented in either *Other assets* or *Other liabilities* on the Consolidated Balance Sheet when the Bank has a legally enforceable right to set off the current tax assets and liabilities and if the deferred tax assets and liabilities relate to taxes levied by the same taxation authority on the same taxable entity or on different taxable entities that intend to settle current tax assets and liabilities based on their net amount.

The Bank makes assumptions to estimate income taxes as well as deferred tax assets and liabilities. This process involves estimating the actual amount of current taxes and evaluating tax loss carryforwards and temporary differences arising from differences between the values of items reported for accounting and for income tax purposes. Deferred tax assets and liabilities presented on the Consolidated Balance Sheet are calculated according to the tax rates to be applied in future periods. Previously recorded deferred tax assets and liabilities must be adjusted when the date of the future event is revised based on current information.

The Bank is subject to the jurisdictions of various tax authorities. In the normal course of its business, the Bank is involved in a number of transactions for which the tax impacts are uncertain. As a result, the Bank accounts for provisions for uncertain tax positions that adequately represent the tax risk stemming from tax matters under discussion or being audited by tax authorities or from other matters involving uncertainty. The amounts of these provisions reflect the best possible estimates of the amounts that may have to be paid based on qualitative assessments of all relevant factors. The provisions are estimated at the end of each reporting period. However, it is possible that, at a future date, a provision might need to be adjusted following an audit by the tax authorities. When the final assessment differs from the initially provisioned amounts, the difference will impact the income taxes of the period in which the assessment was made.

Financial Guarantee Contracts
A financial guarantee contract is a contract or indemnification agreement that could require the Bank to make specified payments (in cash, financial instruments, other assets, Bank shares, or provisions of services) to reimburse a beneficiary in the event of a loss resulting from a debtor defaulting on the original or amended terms of a debt instrument.

To reflect the fair value of an obligation assumed at the inception of a financial guarantee, a liability is recorded in *Other liabilities* on the Consolidated Balance Sheet. After initial recognition, the Bank must measure financial guarantee contracts at the higher of the allowance for credit losses, determined using the ECL model, and of the initially recognized amount less, where applicable, the cumulative amount of revenue recognized. This revenue is recognized in *Credit fees* in the Consolidated Statement of Income.

Note 1 – Basis of Presentation and Summary of Significant Accounting Policies (cont.)

Employee Benefits – Pension Plans and Other Post-Employment Benefit Plans
The Bank offers pension plans that have a defined benefit component and a defined contribution component. The Bank also offers other post-employment benefit plans to eligible employees. The other post-employment benefit plans include post-employment medical, dental, and life insurance coverage. The defined benefit component of the pension plans is funded, whereas the defined contribution component of the pension plans and of the other post-employment benefit plans are not funded.

Defined Benefit Component of the Pension Plans and Other Post-Employment Benefit Plans
Plan expenses and obligations are actuarially determined based on the projected benefit method prorated on service. The calculations incorporate management's best estimates of various actuarial assumptions such as discount rates, rates of compensation increase, health care cost trend rates, mortality rates, and retirement age.

The net asset or net liability related to these plans are calculated separately for each plan as the difference between the present value of the future benefits earned by employees for current and prior-period service and the fair value of plan assets. The net asset or net liability is included in either the *Other assets* or *Other liabilities* item of the Consolidated Balance Sheet.

The expense related to these plans consists of the following items: current service cost, net interest on the net plan asset or liability, administration costs, and past service cost, if any, recognized when a plan is amended. This expense is recognized in *Compensation and employee benefits* in the Consolidated Statement of Income. The net amount of interest income and expense is determined by applying a discount rate to the net plan asset or liability amount.

Remeasurements of defined benefit pension plans and other post-employment benefit plans represent actuarial gains and losses related to the defined benefit obligation and the actual return on plan assets, excluding net interest determined by applying a discount rate to the net plan asset or liability amount. Remeasurements are immediately recognized in *Other comprehensive income* and are not subsequently reclassified to net income; these cumulative gains and losses are reclassified to *Retained earnings.*

Defined Contribution Component of the Pension Plans
The expense for these plans is equivalent to the Bank's contributions during the period and is recognized in *Compensation and employee benefits* in the Consolidated Statement of Income.

Share-Based Payments
The Bank has several share-based compensation plans: the Stock Option Plan, the Stock Appreciation Rights (SAR) Plan, the Deferred Stock Unit (DSU) Plan, the Restricted Stock Unit (RSU) Plan, the Performance Stock Unit (PSU) Plan, the Deferred Compensation Plan (DCP) of National Bank Financial, and the Employee Share Ownership Plan.

Compensation expense is recognized over the service period required for employees to become fully entitled to the award. This period is generally the same as the vesting period, except where the required service period begins before the award date. Compensation expense related to awards granted to employees eligible to retire on the award date is immediately recognized on the award date. Compensation expense related to awards granted to employees who will become eligible to retire during the vesting period is recognized over the period from the award date to the date the employee becomes eligible to retire. For all of these plans, as of the first year of recognition, the expense includes cancellation and forfeiture estimates. These estimates are subsequently revised, as necessary. The Bank uses derivative financial instruments to hedge the risks associated with some of these plans. The compensation expense for these plans, net of related hedges, is recognized in the Consolidated Statement of Income.

Under the Stock Option Plan, the Bank uses the fair value method to account for stock options awarded. The options vest at 25% per year, and each tranche is treated as though it was a separate award. The fair value of each of the tranches is measured on the award date using the Black-Scholes model, and this fair value is recognized in *Compensation and employee benefits* and *Contributed surplus.* When the options are exercised, the *Contributed surplus* amount is credited to *Equity – Common shares* on the Consolidated Balance Sheet. The proceeds received from the employees when these options are exercised are also credited to *Equity – Common shares* on the Consolidated Balance Sheet.

SARs are recorded at fair value when awarded, and their fair value is remeasured at the end of each reporting period until they are exercised. The cost is recognized in *Compensation and employee benefits* in the Consolidated Statement of Income and in *Other liabilities* on the Consolidated Balance Sheet. The obligation that results from the change in fair value at each period is recognized in net income gradually over the vesting period, and periodically thereafter, until the SARs are exercised. When a SAR is exercised, the Bank makes a cash payment equal to the increase in the stock price since the date of the award.

The obligation that results from the award of a DSU, RSU, PSU and DCP unit is recognized in net income, and the corresponding amount is included in *Other liabilities* on the Consolidated Balance Sheet. For the DSU, RSU and DCP plans, the change in the obligation attributable to changes in the share price and dividends paid on the common shares of these plans is recognized in *Compensation and employee benefits* in the Consolidated Statement of Income for the period in which the changes occur. On the redemption date, the Bank makes a cash payment equal to the value of the common shares on that date. For the PSU Plan, the change in the obligation attributable to changes in the share price, adjusted upward or downward depending on the relative result of the performance criteria, and the change in the obligation attributable to dividends paid on the shares awarded under the plan, are recognized in *Compensation and employee benefits* in the Consolidated Statement of Income for the period in which the changes occur. On the redemption date, the Bank makes a cash payment equal to the value of the common shares on that date, adjusted upward or downward according to the performance criteria.

The Bank's contributions to the employee share ownership plan are expensed as incurred.

Note 2 – Future Accounting Policy Changes

The Bank closely monitors both new accounting standards and amendments to existing accounting standards issued by the IASB. The following standard has been issued but is not yet in effect. The Bank is currently assessing the impacts of applying this standard on the consolidated financial statements.

Effective Date – November 1, 2023
IFRS 17 – *Insurance Contracts*
In May 2017, the IASB issued IFRS 17 – *Insurance Contracts* (IFRS 17), a new standard that replaces IFRS 4, the current insurance contract accounting standard. IFRS 17 introduces a new accounting framework that will improve the comparability and quality of financial information. IFRS 17 provides guidance on the recognition, measurement, presentation and disclosure of insurance contracts. IFRS 17 will affect how an entity accounts for its insurance contracts and how it reports financial performance in the consolidated income statement, in particular the timing of revenue recognition for insurance contracts. In June 2020, the IASB issued amendments to IFRS 17 that included a two-year deferral of the effective date along with other changes aimed at addressing concerns and implementation challenges identified after IFRS 17 was published in 2017. IFRS 17, as amended, is to be applied retrospectively for annual periods beginning on or after January 1, 2023. If full retrospective application to a group of insurance contracts is impracticable, the modified retrospective approach or the fair value approach may be used.

To prepare for the application of IFRS 17, the Bank developed a project, set up a specialized team, and established a formal governance structure. It also started executing a detailed plan for the project that defines key activities and the timing of those activities. The project is progressing according to schedule. The Bank is continuing to assess all of the impacts of applying IFRS 17 on its consolidated financial statements as well as on the financial statements of its insurance subsidiary.

Note 3 – Fair Value of Financial Instruments

Fair Value and Carrying Value of Financial Instruments by Category

Financial assets and financial liabilities are recognized on the Consolidated Balance Sheet at fair value or at amortized cost in accordance with the categories set out in the accounting framework for financial instruments.

								As at October 31, 2022
	Carrying value and fair value				Carrying value	Fair value		
	Financial instruments classified as at fair value through profit or loss	Financial instruments designated at fair value through profit or loss	Debt securities classified as at fair value through other comprehensive income	Equity securities designated at fair value through other comprehensive income	Financial instruments at amortized cost, net	Financial instruments at amortized cost, net	Total carrying value	Total fair value
Financial assets								
Cash and deposits with financial institutions	–	–	–	–	31,870	31,870	31,870	31,870
Securities	86,338	1,037	8,272	556	13,516	13,007	109,719	109,210
Securities purchased under reverse repurchase agreements and securities borrowed	–	–	–	–	26,486	26,486	26,486	26,486
Loans and acceptances, net of allowances	10,516	–	–	–	196,228	190,955	206,744	201,471
Other								
Derivative financial instruments	18,547	–	–	–	–	–	18,547	18,547
Other assets	87	–	–	–	3,221	3,221	3,308	3,308
Financial liabilities								
Deposits[1]	–	15,355			251,039	249,937	266,394	265,292
Other								
Acceptances	–	–			6,541	6,541	6,541	6,541
Obligations related to securities sold short	21,817	–			–	–	21,817	21,817
Obligations related to securities sold under repurchase agreements and securities loaned	–	–			33,473	33,473	33,473	33,473
Derivative financial instruments	19,632	–			–	–	19,632	19,632
Liabilities related to transferred receivables	–	11,352			14,925	14,137	26,277	25,489
Other liabilities	–	–			2,632	2,627	2,632	2,627
Subordinated debt	–	–			1,499	1,478	1,499	1,478

(1) Includes embedded derivative financial instruments.

As at October 31, 2021

	Financial instruments classified as at fair value through profit or loss	Financial instruments designated at fair value through profit or loss	Debt securities classified as at fair value through other comprehensive income	Equity securities designated at fair value through other comprehensive income	Financial instruments at amortized cost, net	Financial instruments at amortized cost, net	Total carrying value	Total fair value
	Carrying value and fair value				Carrying value	Fair value		
Financial assets								
Cash and deposits with financial institutions	–	–	–	–	33,879	33,879	33,879	33,879
Securities	83,464	1,347	8,966	617	11,910	11,897	106,304	106,291
Securities purchased under reverse repurchase agreements and securities borrowed	–	–	–	–	7,516	7,516	7,516	7,516
Loans and acceptances, net of allowances	8,539	–	–	–	174,150	173,769	182,689	182,308
Other								
Derivative financial instruments	16,484	–	–	–	–	–	16,484	16,484
Other assets	–	–	–	–	2,244	2,244	2,244	2,244
Financial liabilities								
Deposits(1)	–	14,018			226,920	227,054	240,938	241,072
Other								
Acceptances	–	–			6,836	6,836	6,836	6,836
Obligations related to securities sold short	20,266	–			–	–	20,266	20,266
Obligations related to securities sold under repurchase agreements and securities loaned	–	–			17,293	17,293	17,293	17,293
Derivative financial instruments	19,367	–			–	–	19,367	19,367
Liabilities related to transferred receivables	–	11,398			13,772	13,724	25,170	25,122
Other liabilities	–	–			2,101	2,101	2,101	2,101
Subordinated debt	–	–			768	773	768	773

(1) Includes embedded derivative financial instruments.

Establishing Fair Value

The fair value of a financial instrument is the price that would be received to sell a financial asset or paid to transfer a financial liability in an orderly transaction in the principal market at the measurement date under current market conditions (i.e., an exit price).

Unadjusted quoted prices in active markets provide the best evidence of fair value. When there is no quoted price in an active market, the Bank applies other valuation techniques that maximize the use of relevant observable inputs and that minimize the use of unobservable inputs. Such valuation techniques include the following: using information available from recent market transactions, referring to the current fair value of a comparable financial instrument, applying discounted cash flow analysis, applying option pricing models, or relying on any other valuation technique that is commonly used by market participants and has proven to yield reliable estimates. Judgment is required when applying many of the valuation techniques. The Bank's valuation was based on its assessment of the conditions prevailing as at October 31, 2022 and may change in the future. Furthermore, there may be measurement uncertainty resulting from the choice of valuation model used.

Note 3 – Fair Value of Financial Instruments (cont.)

Valuation Governance
Fair value is established in accordance with a rigorous control framework. The Bank has policies and procedures that govern the process for determining fair value. These policies are documented and periodically reviewed by the Risk Management Group. All valuation models are validated, and controls have been implemented to ensure that they are applied.

The fair value of existing or new products is determined and validated by functions independent of the risk-taking team. Complex fair value matters are reviewed by valuation committees made up of experts from various specialized functions.

For financial instruments classified in Level 3 of the fair value hierarchy, the Bank has documented the hierarchy classification policies, and controls are in place to ensure that fair value is measured appropriately, reliably, and consistently. Valuation methods and the underlying assumptions are regularly reviewed.

Valuation Methods and Assumptions
Financial Instruments Whose Fair Value Equals Carrying Value
The carrying value of the following financial instruments is a reasonable approximation of fair value:

- cash and deposits with financial institutions;
- securities purchased under reverse repurchase agreements and securities borrowed;
- obligations related to securities sold under repurchase agreements and securities loaned;
- customers' liability under acceptances;
- acceptances;
- certain items of other assets and other liabilities.

Securities and Obligations Related to Securities Sold Short
These financial instruments, except for securities at amortized cost, are recognized at fair value on the Consolidated Balance Sheet. Their fair value is based on quoted prices in active markets, i.e., bid prices for financial assets and offered prices for financial liabilities. If there are no quoted prices in an active market, fair value is estimated using prices for securities that are substantially the same. If such prices are not available, fair value is determined using valuation techniques that incorporate assumptions based primarily on observable market inputs such as current market prices, the contractual prices of the underlying instruments, the time value of money, credit risk, interest rate yield curves, and currency rates.

When one or more significant inputs are not observable in the markets, fair value is established primarily using internal estimates and data that consider the valuation policies in effect at the Bank, economic conditions, the characteristics specific to the financial asset or liability, and other relevant factors.

Securities Issued or Guaranteed by Governments
Securities issued or guaranteed by governments include government debt securities of the governments of Canada (federal, provincial and municipal) as well as debt securities of the U.S. government (U.S. Treasury), of other U.S. agencies, and of other foreign governments. The fair value of these securities is based on unadjusted quoted prices in active markets. For those classified in Level 2, quoted prices for identical or similar instruments in active markets are used to determine fair value. In the absence of an observable market, a valuation technique such as the discounted cash flow method could be used, incorporating assumptions on benchmark yields (CDOR, LIBOR and other) and the risk spreads of similar securities.

Equity Securities and Other Debt Securities
The fair value of equity securities is determined primarily by using quoted prices in active markets. For equity securities and other debt securities classified in Level 2, a valuation technique based on quoted prices of identical and similar instruments in an active market is used to determine fair value. In the absence of observable inputs, a valuation technique such as the discounted cash flow method could be used, incorporating assumptions on benchmark yields (CDOR, LIBOR and other) and the risk spreads of similar securities. For those classified in Level 3, fair value can be determined based on net asset value, which represents the estimated value of a security based on valuations received from investment or fund managers or the general partners of limited partnerships. Fair value can also be determined using internal valuation techniques adjusted to reflect financial instrument risk factors and economic conditions.

Derivative Financial Instruments
Derivative financial instruments are recorded at fair value on the Consolidated Balance Sheet. For exchange-traded derivative financial instruments, fair value is based on quoted prices in an active market.

For over-the-counter (OTC) derivative financial instruments, fair value is determined using well established valuation techniques that incorporate assumptions based primarily on observable market inputs such as current market prices and the contractual prices of the underlying instruments, the time value of money, interest rate yield curves, credit curves, currency rates as well as price and rate volatility factors. In establishing the fair value of OTC derivative financial instruments, the Bank also incorporates the following factors:

Credit Valuation Adjustment (CVA)
The CVA is a valuation adjustment applied to derivative financial instruments to reflect the credit risk of the counterparty. For each counterparty, the CVA is based on the expected positive exposure and probabilities of default through time. The exposures are determined by using relevant factors such as current and potential future market values, master netting agreements, collateral agreements, and expected recovery rates. The default probabilities are inferred using credit default swap (CDS) spreads. When such information is unavailable, relevant proxies are used. While the general methodology currently assumes independence between expected positive exposures and probabilities of default, adjustments are applied to certain types of transactions where there is a direct link between the exposure at default and the default probabilities.

Funding Valuation Adjustment (FVA)
The FVA is a valuation adjustment applied to derivative financial instruments to reflect the market-implied cost or benefits of funding collateral for uncollateralized or partly collateralized transactions. The expected exposures are determined using methodologies consistent with the CVA framework. The funding level used to determine the FVA is based on the average funding level of relevant market participants.

When the valuation techniques incorporate one or more significant inputs that are not observable in the markets, the fair value of OTC derivative financial instruments is established primarily on the basis of internal estimates and data that consider the valuation policies in effect at the Bank, economic conditions, the characteristics specific to the financial asset or financial liability, and other relevant factors.

Loans
The fair value of fixed-rate mortgage loans is determined by discounting expected future contractual cash flows, adjusted for several factors, including prepayment options, current market interest rates for similar loans, and other relevant variables where applicable. The fair value of variable-rate mortgage loans is deemed to equal carrying value.

The fair value of other fixed-rate loans is determined by discounting expected future contractual cash flows using current market interest rates charged for similar new loans. The fair value of other variable-rate loans is deemed to equal carrying value.

Deposits
The fair value of fixed-term deposits is determined primarily by discounting expected future contractual cash flows and considering several factors such as redemption options and market interest rates currently offered for financial instruments with similar conditions. For certain term funding instruments, fair value is determined using market prices for similar instruments. The fair value of demand deposits and notice deposits is deemed to equal carrying value.

The fair value of structured deposit notes is established using valuation models that maximize the use of observable inputs when available, such as benchmark indices, and also incorporates the Bank's own credit risk. In calculating the Bank's own credit risk, the market implied spreads of the Bank are used to infer its probabilities of default. Lastly, when fair value is determined using option pricing models, the valuation techniques are similar to those described for derivative financial instruments.

Liabilities Related to Transferred Receivables
These liabilities arise from sale transactions to Canada Housing Trust (CHT) of securities backed by insured residential mortgages and other securities under the Canada Mortgage Bond (CMB) program. These transactions do not qualify for derecognition. They are recorded as guaranteed borrowings, which results in the recording of liabilities on the Consolidated Balance Sheet. The fair value of these liabilities is established using valuation techniques based on observable market inputs such as Canada Mortgage Bond prices.

Note 3 – Fair Value of Financial Instruments (cont.)

Other Liabilities and Subordinated Debt
The fair value of these financial liabilities is based on quoted market prices in an active market. If there is no active market, fair value is determined by discounting contractual cash flows using the current market interest rates offered for similar financial instruments that have the same term to maturity.

Hierarchy of Fair Value Measurements

Determining the Levels of the Fair Value Measurement Hierarchy
IFRS establishes a fair value measurement hierarchy that classifies the inputs used in financial instrument fair value measurement techniques according to three levels. This fair value hierarchy requires observable market inputs to be used whenever such inputs exist. According to the hierarchy, the highest level of inputs are unadjusted quoted prices in active markets for identical instruments and the lowest level of inputs are unobservable inputs. If inputs from different levels of the hierarchy are used, the financial instrument is classified in the same level as the lowest level input that is significant to the fair value measurement. The fair value measurement hierarchy has the following levels:

Level 1
Inputs corresponding to unadjusted quoted prices in active markets for identical assets and liabilities and accessible to the Bank at the measurement date. These instruments consist primarily of equity securities, derivative financial instruments traded in active markets, and certain highly liquid debt securities actively traded in over-the-counter markets.

Level 2
Valuation techniques based on inputs, other than the quoted prices included in Level 1 inputs, that are directly or indirectly observable in the market for the asset or liability. These inputs are quoted prices of similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active; inputs other than quoted prices used in a valuation model that are observable for that instrument; and inputs that are derived principally from or corroborated by observable market inputs by correlation or other means. These instruments consist primarily of certain loans, certain deposits, derivative financial instruments traded in over-the-counter markets, certain debt securities, certain equity securities whose value is not directly observable in an active market, liabilities related to transferred receivables, and certain other liabilities.

Level 3
Valuation techniques based on one or more significant inputs that are not observable in the market for the asset or liability. The Bank classifies financial instruments in Level 3 when the valuation technique is based on at least one significant input that is not observable in the markets. The valuation technique may also be partly based on observable market inputs.

Financial instruments whose fair values are classified in Level 3 consist of the following:

- financial instruments measured at fair value through profit or loss: investments in hedge funds for which there are certain restrictions on unit or security redemptions, equity securities and debt securities of private companies, as well as certain derivative financial instruments whose fair value is established using internal valuation models that are based on significant unobservable market inputs;
- securities at fair value through other comprehensive income: equity and debt securities of private companies;
- certain loans and certain deposits (structured deposit notes) whose fair value is established using internal valuation models that are based on significant unobservable market inputs;
- certain other assets for which fair value is established using internal valuation models that are based on significant unobservable market inputs.

Transfers Between the Fair Value Hierarchy Levels
Transfers of financial instruments between Levels 1 and 2 and transfers to (or from) Level 3 are deemed to have taken place at the beginning of the quarter in which the transfer occurred. Significant transfers can occur between the fair value hierarchy levels due to new information on inputs used to determine fair value and the observable nature of those inputs.

During fiscal 2022, $41 million in securities classified as at fair value through profit or loss and $3 million in obligations related to securities sold short were transferred from Level 2 to Level 1 as a result of changing market conditions ($31 million in securities classified as at fair value through profit or loss and $2 million in obligations related to securities sold short in fiscal 2021). In addition, during fiscal 2022, $26 million in securities classified as at fair value through profit or loss and $2 million in obligations related to securities sold short were transferred from Level 1 to Level 2 as a result of changing market conditions (for fiscal 2021, $30 million in securities classified as at fair value through profit or loss).

During fiscal years 2022 and 2021, financial instruments were transferred to (or from) Level 3 due to changes in the availability of observable market inputs as a result of changing market conditions.

Financial Instruments Recorded at Fair Value on the Consolidated Balance Sheet

The following tables show financial instruments recorded at fair value on the Consolidated Balance Sheet according to the fair value hierarchy.

				As at October 31, 2022
	Level 1	Level 2	Level 3	Total financial assets/liabilities at fair value
Financial assets				
Securities				
At fair value through profit or loss				
Securities issued or guaranteed by				
Canadian government	4,736	8,186	–	12,922
Canadian provincial and municipal governments	–	9,260	–	9,260
U.S. Treasury, other U.S. agencies and other foreign governments	10,639	4,445	–	15,084
Other debt securities	–	3,324	60	3,384
Equity securities	45,805	504	416	46,725
	61,180	25,719	476	87,375
At fair value through other comprehensive income				
Securities issued or guaranteed by				
Canadian government	21	3,191	–	3,212
Canadian provincial and municipal governments	–	1,970	–	1,970
U.S. Treasury, other U.S. agencies and other foreign governments	1,687	191	–	1,878
Other debt securities	–	1,212	–	1,212
Equity securities	–	236	320	556
	1,708	6,800	320	8,828
Loans	–	10,272	244	10,516
Other				
Derivative financial instruments	342	18,204	1	18,547
Other assets – Other items	–	–	87	87
	63,230	60,995	1,128	125,353
Financial liabilities				
Deposits	–	15,424	8	15,432
Other				
Obligations related to securities sold short	15,213	6,604	–	21,817
Derivative financial instruments	625	18,989	18	19,632
Liabilities related to transferred receivables	–	11,352	–	11,352
	15,838	52,369	26	68,233

Note 3 – Fair Value of Financial Instruments (cont.)

				As at October 31, 2021
	Level 1	Level 2	Level 3	Total financial assets/liabilities at fair value
Financial assets				
Securities				
At fair value through profit or loss				
Securities issued or guaranteed by				
Canadian government	2,661	6,716	–	9,377
Canadian provincial and municipal governments	–	8,998	–	8,998
U.S. Treasury, other U.S. agencies and other foreign governments	2,547	1,878	–	4,425
Other debt securities	–	2,484	47	2,531
Equity securities	58,539	517	424	59,480
	63,747	20,593	471	84,811
At fair value through other comprehensive income				
Securities issued or guaranteed by				
Canadian government	19	4,214	–	4,233
Canadian provincial and municipal governments	–	2,313	–	2,313
U.S. Treasury, other U.S. agencies and other foreign governments	1,384	252	–	1,636
Other debt securities	–	784	–	784
Equity securities	–	311	306	617
	1,403	7,874	306	9,583
Loans	–	8,242	297	8,539
Other				
Derivative financial instruments	203	16,278	3	16,484
	65,353	52,987	1,077	119,417
Financial liabilities				
Deposits	–	14,215	–	14,215
Other				
Obligations related to securities sold short	15,546	4,720	–	20,266
Derivative financial instruments	693	18,673	1	19,367
Liabilities related to transferred receivables	–	11,398	–	11,398
	16,239	49,006	1	65,246

Financial Instruments Classified in Level 3

The Bank classifies financial instruments in Level 3 when the valuation technique is based on at least one significant input that is not observable in the markets. The valuation technique may also be based, in part, on observable market inputs. The following table shows the significant unobservable inputs used for the fair value measurements of financial instruments classified in Level 3 of the hierarchy.

As at October 31, 2022

	Fair value	Primary valuation techniques	Significant unobservable inputs	Range of input values Low	High
Financial assets					
Securities					
Equity securities and other debt securities	796	Net asset value	Net asset value	100 %	100 %
		Market comparable	EV/EBITDA[1] multiple	18 x	21 x
		Discounted cash flows	Discount rate	4.50 %	19.00 %
Loans					
Loans at fair value through profit or loss	244	Discounted cash flows	Discount rate	7.06 %	15.09 %
		Discounted cash flows	Liquidity premium	2.62 %	10.49 %
Other					
Derivative financial instruments					
Equity contracts	1	Option pricing model	Long-term volatility	21 %	54 %
			Market correlation	38 %	95 %
Other assets – Other items	87	Discounted cash flows	Discount rate	9 %	9 %
	1,128				
Financial liabilities					
Deposits					
Structured deposit notes[2]	8	Option pricing model	Long-term volatility	10 %	35 %
			Market correlation	(3) %	94 %
Other					
Derivative financial instruments					
Interest rate contracts	8	Discounted cash flows	Discount rate	2.20 %	2.20 %
Equity contracts	10	Option pricing model	Long-term volatility	9 %	51 %
			Market correlation	1 %	95 %
	26				

As at October 31, 2021

	Fair value	Primary valuation techniques	Significant unobservable inputs	Range of input values Low	High
Financial assets					
Securities					
Equity securities and other debt securities	777	Net asset value	Net asset value	100 %	100 %
		Market comparable	EV/EBITDA[1] multiple	18 x	20 x
		Discounted cash flows	Credit spread	560 Bps[3]	560 Bps[3]
		Discounted cash flows	Discount rate	4.50 %	19.00 %
Loans					
Loans at fair value through profit or loss	297	Discounted cash flows	Discount rate	3.25 %	7.09 %
		Discounted cash flows	Liquidity premium	1.98 %	6.27 %
Other					
Derivative financial instruments					
Interest rate contracts	3	Discounted cash flows	Discount rate	2.20 %	2.20 %
	1,077				
Financial liabilities					
Other					
Derivative financial instruments					
Equity contracts	1	Option pricing model	Long-term volatility	6 %	86 %
			Market correlation	(5) %	90 %
	1				

(1) EV/EBITDA means Enterprise Value/Earnings Before Interest, Taxes, Depreciation and Amortization.
(2) Includes embedded derivative financial instruments.
(3) Bps or basis point is a unit of measure equal to 0.01%.

Note 3 – Fair Value of Financial Instruments (cont.)

Significant Unobservable Inputs Used for Fair Value Measurements of Financial Instruments Classified in Level 3

Net Asset Value

Net asset value is the estimated value of a security based on valuations received from the investment or fund managers, the administrators of the conduits, or the general partners of limited partnerships. The net asset value of a fund is the total fair value of assets less liabilities.

EV/EBITDA (Enterprise Value/Earnings Before Interest, Taxes, Depreciation and Amortization) Multiple and Price Equivalent

Private equity valuation inputs include earnings multiples, which are determined based on comparable companies, and a higher multiple will translate into a higher fair value. Price equivalent is a percentage of the market price based on the liquidity of the security.

Discount Rate

The discount rate is the input used to bring future cash flows to their present value. A higher discount rate will translate into a lower fair value.

Liquidity Premium

A liquidity premium may be applied when few or no transactions exist to support the valuations. A higher liquidity premium will result in a lower value.

Long-Term Volatility

Volatility is a measure of the expected future variability of market prices. Volatility is generally observable in the market through options prices. However, the long-term volatility of options with a longer maturity might not be observable. An increase (decrease) in long-term volatility is generally associated with an increase (decrease) in long-term correlation. Higher long-term volatility may increase or decrease an instrument's fair value depending on its terms.

Market Correlation

Correlation is a measure of the inter-relationship between two different variables. A positive correlation means that the variables tend to move in the same direction; a negative correlation means that the variables tend to move in opposite directions. Correlation is used to measure financial instruments whose future returns depend on several variables. Changes in correlation will either increase or decrease a financial instrument's fair value depending on the terms of its contractual payout.

Credit Spread

A credit spread (yield) is the difference between the instrument's yield and a benchmark yield. Benchmark instruments have high credit quality ratings with similar maturities. The credit spread therefore represents the discount rate used to determine the present value of future cash flows of an asset to reflect the market return required for credit quality in the estimated cash flows. A higher credit spread will result in a lower value.

Sensitivity Analysis of Financial Instruments Classified in Level 3

The Bank performs sensitivity analyses for the fair value measurements of Level 3 financial instruments, substituting unobservable inputs with one or more reasonably possible alternative assumptions.

For equity securities and other debt securities, the Bank varies significant unobservable inputs such as net asset values, EV/EBITDA multiples, or price equivalents and establishes a reasonable fair value range that could result in a $126 million increase or decrease in the fair value recorded as at October 31, 2022 (a $115 million increase or decrease as at October 31, 2021).

For loans, the Bank varies unobservable inputs such as a liquidity premium and establishes a reasonable fair value range that could result in a $31 million increase or decrease in the fair value recorded as at October 31, 2022 (a $28 million increase or decrease as at October 31, 2021).

For derivative financial instruments and embedded derivative financial instruments related to structured deposit notes, the Bank varies long-term volatility and market correlation inputs and establishes a reasonable fair value range. As at October 31, 2022, for derivative financial instruments, the net fair value could result in a $5 million increase or decrease (a $1 million increase or decrease as at October 31, 2021), whereas for structured deposit notes, the net fair value could result in a $1 million increase or decrease (no sensitivity analysis as at October 31, 2021 since there were no structured deposit notes classified in Level 3).

For other assets, the Bank varies unobservable inputs such as discount rates and establishes a reasonable fair value range that could result in a $10 million increase or decrease in the fair value recorded as at October 31, 2022 (no sensitivity analysis as at October 31, 2021 since there were no other assets classified in Level 3).

For all Level 3 financial instruments, the reasonable fair value ranges could result in a 5% increase or decrease in net income as at October 31, 2022 (a 5% increase or decrease in net income as at October 31, 2021).

Change in the Fair Value of Financial Instruments Classified in Level 3

The Bank may hedge the fair value of financial instruments classified in the various levels through offsetting hedge positions. Gains and losses for financial instruments classified in Level 3 presented in the following tables do not reflect the inverse gains and losses on financial instruments used for economic hedging purposes that may have been classified in Level 1 or 2 by the Bank. In addition, the Bank may hedge the fair value of financial instruments classified in Level 3 using other financial instruments classified in Level 3. The effect of these hedges is not included in the net amount presented in the following tables. The gains and losses presented hereafter may comprise changes in fair value based on observable and unobservable inputs.

					Year ended October 31, 2022
	Securities at fair value through profit or loss	Securities at fair value through other comprehensive income	Loans and other assets	Derivative financial instruments[1]	Deposits[2]
Fair value as at October 31, 2021	471	306	297	2	–
Total realized and unrealized gains (losses) included in *Net income*[3]	21	–	(50)	(19)	3
Total realized and unrealized gains (losses) included in *Other comprehensive income*	–	7	–	–	–
Purchases	60	7	71	–	–
Sales	(64)	–	–	–	–
Issuances	–	–	22	–	(3)
Settlements and other	–	–	(9)	(1)	–
Financial instruments transferred into Level 3	–	–	–	1	(8)
Financial instruments transferred out of Level 3	(12)	–	–	–	–
Fair value as at October 31, 2022	476	320	331	(17)	(8)
Change in unrealized gains and losses included in *Net income* with respect to financial assets and financial liabilities held as at October 31, 2022[4]	3	–	(50)	(19)	3

					Year ended October 31, 2021
	Securities at fair value through profit or loss	Securities at fair value through other comprehensive income	Loans and other assets	Derivative financial instruments[1]	Deposits[2]
Fair value as at October 31, 2020	457	373	372	29	2
Total realized and unrealized gains (losses) included in *Net income*[5]	13	–	24	(28)	–
Total realized and unrealized gains (losses) included in *Other comprehensive income*	–	(10)	–	–	–
Purchases	43	–	–	–	–
Sales	(42)	(113)	–	–	–
Issuances	–	–	12	–	–
Settlements and other[6]	–	56	(111)	(1)	–
Financial instruments transferred into Level 3	–	–	–	(1)	–
Financial instruments transferred out of Level 3	–	–	–	3	(2)
Fair value as at October 31, 2021	471	306	297	2	–
Change in unrealized gains and losses included in *Net income* with respect to financial assets and financial liabilities held as at October 31, 2021[7]	14	–	24	(28)	–

(1) The derivative financial instruments include assets and liabilities presented on a net basis.
(2) The amounts include the fair value of embedded derivative financial instruments in deposits.
(3) Total gains (losses) included in *Non-interest income* was a loss of $45 million.
(4) Total unrealized gains (losses) included in *Non-interest income* was an unrealized loss of $63 million.
(5) Total gains (losses) included in *Non-interest income* was a gain of $9 million.
(6) On October 31, 2021, the Bank concluded that it had lost significant influence over AfrAsia Bank Limited (AfrAsia) and therefore ceased using the equity method to account for this investment. The Bank designated its investment in AfrAsia as a financial asset measured at fair value through other comprehensive income in an amount of $56 million.
(7) Total unrealized gains (losses) included in *Non-interest income* was an unrealized gain of $10 million.

Note 3 – Fair Value of Financial Instruments (cont.)

Financial Instruments Not Recorded at Fair Value on the Consolidated Balance Sheet

The following tables show the financial instruments that have not been recorded at fair value on the Consolidated Balance Sheet according to the fair value hierarchy, except for those whose carrying value is a reasonable approximation of fair value.

				As at October 31, 2022
	Level 1	Level 2	Level 3	Total
Financial assets				
Securities at amortized cost				
Securities issued or guaranteed by				
Canadian government	–	5,439	–	5,439
Canadian provincial and municipal governments	–	1,708	–	1,708
U.S. Treasury, other U.S. agencies and other foreign governments	–	140	–	140
Other debt securities	–	5,720	–	5,720
	–	13,007	–	13,007
Loans, net of allowances	–	81,828	102,640	184,468
Financial liabilities				
Deposits	–	249,937	–	249,937
Other				
Liabilities related to transferred receivables	–	14,137	–	14,137
Other liabilities	–	73	–	73
Subordinated debt	–	1,478	–	1,478
	–	265,625	–	265,625

				As at October 31, 2021
	Level 1	Level 2	Level 3	Total
Financial assets				
Securities at amortized cost				
Securities issued or guaranteed by				
Canadian government	–	5,793	–	5,793
Canadian provincial and municipal governments	–	2,227	–	2,227
U.S. Treasury, other U.S. agencies and other foreign governments	–	–	–	–
Other debt securities	–	3,877	–	3,877
	–	11,897	–	11,897
Loans, net of allowances	–	67,149	99,872	167,021
Financial liabilities				
Deposits	–	227,054	–	227,054
Other				
Liabilities related to transferred receivables	–	13,724	–	13,724
Other liabilities	–	114	–	114
Subordinated debt	–	773	–	773
	–	241,665	–	241,665

Note 4 – Financial Instruments Designated at Fair Value Through Profit or Loss

The Bank chose to designate certain financial instruments at fair value through profit or loss according to the criteria presented in Note 1 to these consolidated financial statements. Consistent with its risk management strategy and in accordance with the fair value option, which permits the designation if it eliminates or significantly reduces a measurement or recognition inconsistency that would otherwise arise from measuring financial assets and liabilities or recognizing the gains and losses thereon on different bases, the Bank designated certain securities and certain liabilities related to transferred receivables at fair value through profit or loss. The fair value of liabilities related to transferred receivables does not include credit risk, as the holders of these liabilities are not exposed to the Bank's credit risk. The Bank also designated certain deposits that include embedded derivative financial instruments at fair value through profit or loss.

To determine a change in fair value arising from a change in the credit risk of deposits designated at fair value through profit or loss, the Bank calculates, at the beginning of the period, the present value of the instrument's contractual cash flows using the following rates: first, an observed discount rate for similar securities that reflects the Bank's credit spread and, then, a rate that excludes the Bank's credit spread. The difference obtained between the two values is then compared to the difference obtained using the same rates at the end of the period.

Information about the financial assets and financial liabilities designated at fair value through profit or loss is provided in the following tables.

	Carrying value as at October 31, 2022	Unrealized gains (losses) for the year ended October 31, 2022	Unrealized gains (losses) since the initial recognition of the instrument
Financial assets designated at fair value through profit or loss			
Securities	1,037	(21)	(7)
	1,037	(21)	(7)
Financial liabilities designated at fair value through profit or loss			
Deposits[1][2]	15,355	2,888	3,062
Liabilities related to transferred receivables	11,352	513	533
	26,707	3,401	3,595

	Carrying value as at October 31, 2021	Unrealized gains (losses) for the year ended October 31, 2021	Unrealized gains (losses) since the initial recognition of the instrument
Financial assets designated at fair value through profit or loss			
Securities	1,347	(55)	27
	1,347	(55)	27
Financial liabilities designated at fair value through profit or loss			
Deposits[1][2]	14,018	(636)	(316)
Liabilities related to transferred receivables	11,398	253	27
	25,416	(383)	(289)

(1) For the year ended October 31, 2022, the change in the fair value of deposits designated at fair value through profit or loss attributable to credit risk, and recorded in *Other comprehensive income*, resulted in a gain of $817 million ($17 million loss for the year ended October 31, 2021).
(2) The amount at maturity that the Bank will be contractually required to pay to the holders of these deposits varies and will differ from the reporting date fair value.

Note 5 – Offsetting Financial Assets and Financial Liabilities

Financial assets and liabilities are offset, and the net amount is presented on the Consolidated Balance Sheet when the Bank has a legally enforceable right to set off the recognized amounts and intends to settle on a net basis or to realize the asset and settle the liability simultaneously.

Generally, over-the-counter derivatives financial instruments subject to master netting agreements of the International Swaps & Derivatives Association, Inc. or other similar agreements do not meet the offsetting criteria on the Consolidated Balance Sheet, because the right of set-off is legally enforceable only in the event of default, insolvency, or bankruptcy.

Generally, securities purchased under reverse repurchase agreements and securities borrowed as well as obligations related to securities sold under repurchase agreements and securities loaned, subject to master agreements, do not meet the offsetting criteria if they confer only a right of set-off that is enforceable only in the event of default, insolvency, or bankruptcy.

However, the above-mentioned transactions may be subject to contractual netting agreements concluded with clearing houses. If the offsetting criteria are met, these transactions are netted on the Consolidated Balance Sheet. In addition, as part of these transactions, the Bank may pledge or receive cash or other financial instruments used as collateral.

The following tables present information on financial assets and financial liabilities that are netted on the Consolidated Balance Sheet, because they meet the offsetting criteria as well as information on those that are not netted and are subject to an enforceable master netting agreement or similar agreement.

						As at October 31, 2022
				Associated amounts not set off on the Consolidated Balance Sheet		
	Gross amounts recognized	Amounts set off on the Consolidated Balance Sheet	Net amounts reported on the Consolidated Balance Sheet	Financial instruments(1)	Financial assets received/pledged as collateral(2)	Net amounts
Financial assets						
Securities purchased under reverse repurchase agreements and securities borrowed	32,134	5,648	26,486	1,887	24,459	140
Derivative financial instruments	33,112	14,565	18,547	9,583	6,062	2,902
	65,246	20,213	45,033	11,470	30,521	3,042
Financial liabilities						
Obligations related to securities sold under repurchase agreements and securities loaned	39,121	5,648	33,473	1,887	31,440	146
Derivative financial instruments	34,197	14,565	19,632	9,583	4,089	5,960
	73,318	20,213	53,105	11,470	35,529	6,106

						As at October 31, 2021
				Associated amounts not set off on the Consolidated Balance Sheet		
	Gross amounts recognized	Amounts set off on the Consolidated Balance Sheet	Net amounts reported on the Consolidated Balance Sheet	Financial instruments(1)	Financial assets received/pledged as collateral(2)(3)	Net amounts
Financial assets						
Securities purchased under reverse repurchase agreements and securities borrowed	15,216	7,700	7,516	1,413	6,042	61
Derivative financial instruments	20,936	4,452	16,484	9,398	2,475	4,611
	36,152	12,152	24,000	10,811	8,517	4,672
Financial liabilities						
Obligations related to securities sold under repurchase agreements and securities loaned	24,993	7,700	17,293	1,413	15,759	121
Derivative financial instruments	23,819	4,452	19,367	9,398	4,015	5,954
	48,812	12,152	36,660	10,811	19,774	6,075

(1) Carrying amount of financial instruments that are subject to an enforceable master netting agreement or similar agreement but that do not satisfy offsetting criteria.
(2) Excludes collateral in the form of non-financial instruments.
(3) The financial assets pledged as collateral to the Bank of Canada included covered bonds issued by the Bank.

Note 6 – Securities

Residual Contractual Maturities of Securities

As at October 31					2022	2021
	1 year or less	Over 1 year to 5 years	Over 5 years	No specified maturity	Total	Total
Securities at fair value through profit or loss						
Securities issued or guaranteed by						
Canadian government	2,563	7,609	2,750	–	12,922	9,377
Canadian provincial and municipal governments	1,126	1,725	6,409	–	9,260	8,998
U.S. Treasury, other U.S. agencies and other foreign governments	13,927	848	309	–	15,084	4,425
Other debt securities	370	1,821	1,193	–	3,384	2,531
Equity securities	–	–	–	46,725	46,725	59,480
	17,986	12,003	10,661	46,725	87,375	84,811
Securities at fair value through other comprehensive income						
Securities issued or guaranteed by						
Canadian government	106	3,071	35	–	3,212	4,233
Canadian provincial and municipal governments	2	569	1,399	–	1,970	2,313
U.S. Treasury, other U.S. agencies and other foreign governments	–	1,597	281	–	1,878	1,636
Other debt securities	6	625	581	–	1,212	784
Equity securities	–	–	–	556	556	617
	114	5,862	2,296	556	8,828	9,583
Securities at amortized cost[1]						
Securities issued or guaranteed by						
Canadian government	670	5,037	30	–	5,737	5,811
Canadian provincial and municipal governments	279	643	904	–	1,826	2,225
U.S. Treasury, other U.S. agencies and other foreign governments	2	148	–	–	150	–
Other debt securities	2,850	2,814	139	–	5,803	3,874
	3,801	8,642	1,073	–	13,516	11,910

(1) As at October 31, 2022, securities at amortized cost are presented net of $7 million in allowances for credit losses ($3 million as at October 31, 2021).

Credit Quality

As at October 31, 2022 and 2021, securities at fair value through other comprehensive income and securities at amortized cost were mainly classified in Stage 1, with their credit quality falling mostly in the “Excellent” category according to the Bank’s internal risk-rating categories. For additional information on the reconciliation of allowances for credit losses, see Note 7 to these consolidated financial statements.

Note 6 – Securities (cont.)

Unrealized Gross Gains (Losses) on Securities at Fair Value Through Other Comprehensive Income

				As at October 31, 2022
	Amortized cost	**Gross unrealized gains**	**Gross unrealized losses**	**Carrying value[(1)]**
Securities issued or guaranteed by				
Canadian government	**3,386**	**1**	**(175)**	**3,212**
Canadian provincial and municipal governments	**2,129**	**1**	**(160)**	**1,970**
U.S. Treasury, other U.S. agencies and other foreign governments	**2,022**	**–**	**(144)**	**1,878**
Other debt securities	**1,355**	**–**	**(143)**	**1,212**
Equity securities	**570**	**21**	**(35)**	**556**
	9,462	**23**	**(657)**	**8,828**

				As at October 31, 2021
	Amortized cost	Gross unrealized gains	Gross unrealized losses	Carrying value[(1)]
Securities issued or guaranteed by				
Canadian government	4,241	30	(38)	4,233
Canadian provincial and municipal governments	2,345	27	(59)	2,313
U.S. Treasury, other U.S. agencies and other foreign governments	1,648	–	(12)	1,636
Other debt securities	782	9	(7)	784
Equity securities	569	57	(9)	617
	9,585	123	(125)	9,583

(1) The allowances for credit losses on securities at fair value through other comprehensive income (excluding equity securities), representing $2 million as at October 31, 2022 ($1 million as at October 31, 2021), are reported in *Other comprehensive income*. For additional information, see Note 7 to these consolidated financial statements.

Equity Securities Designated at Fair Value Through Other Comprehensive Income

The Bank designated certain equity securities, the main business objective of which is to generate dividend income, at fair value through other comprehensive income without subsequent reclassification of gains and losses to net income. During the year ended October 31, 2022, a dividend income amount of $14 million was recognized for these investments ($34 million for the year ended October 31, 2021), including an amount of $4 million in dividend income for investments that were sold during the year ended October 31, 2022 ($17 million for investments sold during the year ended October 31, 2021).

			Year ended October 31, 2022			Year ended October 31, 2021
	Equity securities of private companies	**Equity securities of public companies**	**Total**	Equity securities of private companies	Equity securities of public companies	Total
Fair value at beginning	**306**	**311**	**617**	373	246	619
Change in fair value	**7**	**(44)**	**(37)**	(10)	98	88
Designated at fair value through other comprehensive income[(1)]	**7**	**143**	**150**	56	71	127
Sales[(2)]	**–**	**(174)**	**(174)**	(113)	(104)	(217)
Fair value at end	**320**	**236**	**556**	306	311	617

(1) On October 31, 2021, the Bank concluded that it had lost significant influence over AfrAsia Bank Limited (AfrAsia) and therefore ceased using the equity method to account for this investment. The Bank designated its investment in AfrAsia as a financial asset measured at fair value through other comprehensive income in an amount of $56 million. Following the fair value measurement, a $30 million loss was recorded in the *Non-interest income – Other* item of the Consolidated Statement of Income and reported in the *Other* heading of segment results.
(2) The Bank disposed of private and public company equity securities for economic reasons.

Gains (Losses) on Disposals of Securities at Amortized Cost

During the years ended October 31, 2022 and 2021, the Bank sold certain debt securities measured at amortized cost. The carrying value of these securities upon disposal was $337 million for the year ended October 31, 2022 ($179 million for the year ended October 31, 2021), and the Bank recognized gains of $4 million for the year ended October 31, 2022 (negligible amount for the year ended October 31, 2021) in *Non-interest income – Gains (losses) on non-trading securities, net* in the Consolidated Statement of Income.

Note 7 – Loans and Allowances for Credit Losses

Loans are recognized either at fair value through profit or loss or at amortized cost using the financial asset classification criteria defined in IFRS 9.

Determining and Measuring Expected Credit Losses (ECL)

Determining Expected Credit Losses
Expected credit losses are determined using a three-stage impairment approach that is based on the change in the credit quality of financial assets since initial recognition.

Non-impaired loans
Stage 1
Financial assets that have experienced no significant increase in credit risk between initial recognition and the reporting date, and for which 12-month expected credit losses are recorded at the reporting date, are classified in Stage 1.

Stage 2
Financial assets that have experienced a significant increase in credit risk between initial recognition and the reporting date, and for which lifetime expected credit losses are recorded at the reporting date, are classified in Stage 2.

Impaired loans
Stage 3
Financial assets for which there is objective evidence of impairment, for which one or more events have had a detrimental impact on the estimated future cash flows of these financial assets at the reporting date, and for which lifetime expected credit losses are recorded, are classified in Stage 3.

POCI
Financial assets that are credit-impaired when purchased or originated (POCI) are classified in the POCI category.

Impairment Governance
A rigorous control framework is applied to the determination of expected credit losses. The Bank has policies and procedures that govern impairments arising from credit risk. These policies are documented and periodically reviewed by the Risk Management Group. All models used to calculate expected credit losses are validated, and controls are in place to ensure they are applied.

These models are validated by groups that are independent of the team that prepares the calculations. Complex questions on measurement methodologies and assumptions are reviewed by a group of experts from various functions. Furthermore, the inputs and assumptions used to determine expected credit losses are regularly reviewed.

Measurement of Expected Credit Losses (ECL)
Expected credit losses are estimated using three main variables: (1) probability of default (PD), (2) loss given default (LGD) and (3) exposure at default (EAD). For accounting purposes, 12-month PD and lifetime PD are the probabilities of a default occurring over the next 12 months or over the life of a financial instrument, respectively, based on conditions existing at the balance sheet date and on future economic conditions that have, or will have, an impact on credit risk. LGD reflects the losses expected should default occur and considers such factors as the mitigating effects of collateral, the realizable value thereof, and the time value of money. EAD is the expected balance owing at default and considers such factors as repayments of principal and interest between the balance sheet date and the time of default as well as any amounts expected to be drawn on a committed facility. Twelve-month expected credit losses are estimated by multiplying 12-month PD by LGD and by EAD. Lifetime expected credit losses are estimated using the lifetime PD.

For most financial instruments, expected credit losses are measured on an individual basis. Financial instruments that have credit losses measured on a collective basis are grouped according to similar credit risk characteristics such as type of instrument, geographic location, comparable risk level, and business sector or industry.

Inputs, Assumptions and Estimation Techniques
The Bank's approach to calculating expected credit losses consists essentially of leveraging existing regulatory models and then adjusting their parameters for IFRS 9 purposes. These models have the advantage of having been thoroughly tested and validated. In addition, using the same base models, regardless of the purpose, provides consistency across risk assessments. These models use inputs, assumptions and estimation techniques that require a high degree of management judgment. The main factors that contribute to changes in ECL that are subject to significant judgment include the following:

- calibration of regulatory parameters in order to obtain point-in-time and forward-looking parameters;
- forecasts of macroeconomic variables for multiple scenarios and the probability weighting of the scenarios;
- determination of the significant increases in credit risk (SICR) of a loan.

Note 7 – Loans and Allowances for Credit Losses (cont.)

Main Parameters

PD Estimates

Since the objective of the regulatory calibration of PD is to align historical data to the long-run default rate, adjustments are required to obtain a point-in-time, forward-looking PD, as required by IFRS 9. The Bank performs the following: (1) A point-in-time calibration, where the PD of the portfolio is aligned with the appropriate default rate. The resulting PD estimate generally equals the prior-year default rate. The prior-year default rate is selected for the calibration performed at this stage, as it often reflects one of the most accurate and appropriate estimates of the current-year default rate; (2) Forward-looking adjustments are incorporated through, among other measures, a calibration factor based on forecasts produced by the stress testing team's analyses. The team considers three macroeconomic scenarios, and, for each scenario, produces a forward-looking assessment covering the three upcoming years.

LGD Estimates

The LGD estimation method consists of using, for each of the three macroeconomic scenarios, expected LGD based on the LGD values observed using backtesting, the economic LGD estimated and used to calculate economic capital, and lastly, the estimated downturn LGD used to calculate regulatory capital.

EAD Estimates

For term loans, the Bank uses expected EAD, which is the outstanding balance anticipated at each point in time. Expected EAD decreases over time according to contractual repayments and to prepayments. For revolving loans, the EAD percentage is based on the percentage estimated by the corresponding regulatory model and, thereafter, is converted to dollars according to the authorized balance.

Expected Life

For most financial instruments, the expected life used when measuring expected credit losses is the remaining contractual life. For revolving financial instruments where there is no contractual maturity, such as credit cards or lines of credit, the expected life is based on the behavioural life of clients who have defaulted or closed their account.

Incorporation of Forward-Looking Information

The Bank's Economy and Strategy Group is responsible for developing three macroeconomic scenarios and for recommending probability weights for each scenario. Macroeconomic scenarios are not developed for specific portfolios, as the Economy and Strategy Group provides a set of variables for each of the defined scenarios for the next three years. The PDs are also adjusted to incorporate economic assumptions (interest rates, unemployment rates, GDP forecasts, oil prices, housing price indices, etc.) that can be statistically tied to PD changes that will have an impact beyond the next 12 months. These statistical relationships are determined using the processes developed for stress testing. In addition, the group considers other relevant factors that may not be adequately reflected in the information used to calculate the PDs (including late payments and whether the financial asset is subject to additional monitoring within the watchlist process for business and government loan portfolios).

Determination of a Significant Increase in the Credit Risk of a Financial Instrument

At each reporting period, the Bank determines whether credit risk has increased significantly since initial recognition by examining the change in the risk of default occurring over the remaining life of the financial instrument. First, the Bank compares the point-in-time forward-looking remaining lifetime PD at the reporting date with the expected point-in-time forward-looking remaining lifetime PD established at initial recognition. Based on this comparison, the Bank determines whether the loan has deteriorated when compared to the initial conditions. Because the comparison includes an adjustment based on origination-date forward-looking information and reporting-date forward-looking information, the deterioration may be caused by the following factors: (i) deterioration of the economic outlook used in the forward-looking assessment; (ii) deterioration of the borrower's conditions (payment defaults, worsening financial ratios, etc.); or (iii) a combination of both factors. The quantitative criteria used to determine a significant increase in credit risk are a series of relative and absolute thresholds, and a backstop is also applied. All financial instruments that are over 30 days past due but below 90 days past due are migrated to Stage 2, even if the other criteria do not indicate a significant increase in credit risk.

Credit Quality of Loans

The following tables present the gross carrying amounts of loans as at October 31, 2022 and 2021, according to credit quality and ECL impairment stage of each loan category at amortized cost, and according to credit quality for loans at fair value through profit or loss. For additional information on credit quality according to the Advanced Internal Ratings-Based (AIRB) categories, see the Internal Default Risk Ratings table on page 78 in the Credit Risk section of the MD&A for the year ended October 31, 2022.

						As at October 31, 2022
	Non-impaired loans		Impaired loans		Loans at fair value through profit or loss[1]	
	Stage 1	Stage 2	Stage 3	POCI		Total
Residential mortgage						
Excellent	30,465	–	–	–	–	30,465
Good	16,351	12	–	–	–	16,363
Satisfactory	10,765	3,269	–	–	–	14,034
Special mention	609	394	–	–	–	1,003
Substandard	76	140	–	–	–	216
Default	–	–	49	–	–	49
AIRB Approach	58,266	3,815	49	–	–	62,130
Standardized Approach	7,266	179	211	384	9,959	17,999
Gross carrying amount	65,532	3,994	260	384	9,959	80,129
Allowances for credit losses[2]	53	80	61	(76)	–	118
Carrying amount	65,479	3,914	199	460	9,959	80,011
Personal						
Excellent	22,190	22	–	–	–	22,212
Good	8,792	479	–	–	–	9,271
Satisfactory	6,928	1,394	–	–	–	8,322
Special mention	358	775	–	–	–	1,133
Substandard	26	203	–	–	–	229
Default	–	–	130	–	–	130
AIRB Approach	38,294	2,873	130	–	–	41,297
Standardized Approach	3,837	78	36	75	–	4,026
Gross carrying amount	42,131	2,951	166	75	–	45,323
Allowances for credit losses[2]	67	113	75	(16)	–	239
Carrying amount	42,064	2,838	91	91	–	45,084
Credit card						
Excellent	600	–	–	–	–	600
Good	359	–	–	–	–	359
Satisfactory	689	51	–	–	–	740
Special mention	287	178	–	–	–	465
Substandard	37	71	–	–	–	108
Default	–	–	–	–	–	–
AIRB Approach	1,972	300	–	–	–	2,272
Standardized Approach	117	–	–	–	–	117
Gross carrying amount	2,089	300	–	–	–	2,389
Allowances for credit losses[2]	31	95	–	–	–	126
Carrying amount	2,058	205	–	–	–	2,263
Business and government[3]						
Excellent	6,140	2	–	–	147	6,289
Good	27,607	112	–	–	53	27,772
Satisfactory	26,567	8,803	–	–	145	35,515
Special mention	75	1,172	–	–	–	1,247
Substandard	41	272	–	–	–	313
Default	–	–	367	–	–	367
AIRB Approach	60,430	10,361	367	–	345	71,503
Standardized Approach	8,096	28	19	–	212	8,355
Gross carrying amount	68,526	10,389	386	–	557	79,858
Allowances for credit losses[2]	115	160	197	–	–	472
Carrying amount	68,411	10,229	189	–	557	79,386
Total loans and acceptances						
Gross carrying amount	178,278	17,634	812	459	10,516	207,699
Allowances for credit losses[2]	266	448	333	(92)	–	955
Carrying amount	178,012	17,186	479	551	10,516	206,744

(1) Not subject to expected credit losses.
(2) The allowances for credit losses do not include the amounts related to undrawn commitments reported in the *Other liabilities* item of the Consolidated Balance Sheet.
(3) Includes customers' liability under acceptances.

Note 7 – Loans and Allowances for Credit Losses (cont.)

As at October 31, 2021

	Non-impaired loans		Impaired loans			
	Stage 1	Stage 2	Stage 3	POCI	Loans at fair value through profit or loss(1)	Total
Residential mortgage						
Excellent	28,911	1	–	–	–	28,912
Good	17,083	53	–	–	–	17,136
Satisfactory	9,165	2,318	–	–	–	11,483
Special mention	314	266	–	–	–	580
Substandard	83	128	–	–	–	211
Default	–	–	82	–	–	82
AIRB Approach	55,556	2,766	82	–	–	58,404
Standardized Approach	5,803	129	57	332	7,817	14,138
Gross carrying amount	61,359	2,895	139	332	7,817	72,542
Allowances for credit losses(2)	50	52	29	(60)	–	71
Carrying amount	61,309	2,843	110	392	7,817	72,471
Personal						
Excellent	16,211	57	–	–	–	16,268
Good	11,439	1,041	–	–	–	12,480
Satisfactory	4,665	1,580	–	–	–	6,245
Special mention	336	483	–	–	–	819
Substandard	121	129	–	–	–	250
Default	–	–	101	–	–	101
AIRB Approach	32,772	3,290	101	–	–	36,163
Standardized Approach	4,692	51	15	132	–	4,890
Gross carrying amount	37,464	3,341	116	132	–	41,053
Allowances for credit losses(2)	70	98	63	(29)	–	202
Carrying amount	37,394	3,243	53	161	–	40,851
Credit card						
Excellent	559	–	–	–	–	559
Good	322	–	–	–	–	322
Satisfactory	623	38	–	–	–	661
Special mention	294	149	–	–	–	443
Substandard	38	62	–	–	–	100
Default	–	–	–	–	–	–
AIRB Approach	1,836	249	–	–	–	2,085
Standardized Approach	65	–	–	–	–	65
Gross carrying amount	1,901	249	–	–	–	2,150
Allowances for credit losses(2)	33	89	–	–	–	122
Carrying amount	1,868	160	–	–	–	2,028
Business and government(3)						
Excellent	5,086	–	–	–	269	5,355
Good	24,395	131	–	–	53	24,579
Satisfactory	22,808	6,254	–	–	140	29,202
Special mention	128	1,509	–	–	–	1,637
Substandard	45	194	–	–	–	239
Default	–	–	326	–	–	326
AIRB Approach	52,462	8,088	326	–	462	61,338
Standardized Approach	6,179	84	81	–	260	6,604
Gross carrying amount	58,641	8,172	407	–	722	67,942
Allowances for credit losses(2)	111	205	287	–	–	603
Carrying amount	58,530	7,967	120	–	722	67,339
Total loans and acceptances						
Gross carrying amount	159,365	14,657	662	464	8,539	183,687
Allowances for credit losses(2)	264	444	379	(89)	–	998
Carrying amount	159,101	14,213	283	553	8,539	182,689

(1) Not subject to expected credit losses.
(2) The allowances for credit losses do not include the amounts related to undrawn commitments reported in the *Other liabilities* item of the Consolidated Balance Sheet.
(3) Includes customers' liability under acceptances.

The following table presents the credit risk exposures of off-balance-sheet commitments as at October 31, 2022 and 2021 according to credit quality and ECL impairment stage.

As at October 31				2022				2021
	Stage 1	**Stage 2**	**Stage 3**	**Total**	Stage 1	Stage 2	Stage 3	Total
Off-balance-sheet commitments[1]								
Retail								
Excellent	15,292	13	–	15,305	17,053	72	–	17,125
Good	3,316	165	–	3,481	3,750	323	–	4,073
Satisfactory	1,170	180	–	1,350	1,085	229	–	1,314
Special mention	193	68	–	261	197	57	–	254
Substandard	15	15	–	30	16	13	–	29
Default	–	–	1	1	–	–	3	3
Non-retail								
Excellent	13,136	–	–	13,136	14,097	–	–	14,097
Good	18,723	24	–	18,747	17,497	2	–	17,499
Satisfactory	7,894	3,488	–	11,382	7,575	2,377	–	9,952
Special mention	12	246	–	258	14	336	–	350
Substandard	4	24	–	28	5	38	–	43
Default	–	–	18	18	–	–	3	3
AIRB Approach	59,755	4,223	19	63,997	61,289	3,447	6	64,742
Standardized Approach	15,432	–	–	15,432	14,872	–	1	14,873
Total exposure	75,187	4,223	19	79,429	76,161	3,447	7	79,615
Allowances for credit losses	99	63	–	162	104	58	–	162
Total exposure, net of allowances	75,088	4,160	19	79,267	76,057	3,389	7	79,453

(1) Represent letters of guarantee and documentary letters of credit, undrawn commitments, and backstop liquidity and credit enhancement facilities.

Loans Past Due But Not Impaired[1]

As at October 31				2022				2021
	Residential mortgage	**Personal**	**Credit card**	**Business and government**[2]	Residential mortgage	Personal	Credit card	Business and government[2]
Past due but not impaired								
31 to 60 days	106	105	23	23	48	71	20	24
61 to 90 days	38	30	11	9	18	21	9	13
Over 90 days[3]	–	–	22	–	–	–	21	–
	144	135	56	32	66	92	50	37

(1) Loans less than 31 days past due are not presented as they are not considered past due from an administrative standpoint.
(2) Includes customers' liability under acceptances.
(3) All loans more than 90 days past due, except for credit card receivables, are considered impaired (Stage 3).

Note 7 – Loans and Allowances for Credit Losses (cont.)

Impaired Loans

As at October 31			2022			2021
	Gross	Allowances for credit losses	Net	Gross	Allowances for credit losses	Net
Loans – Stage 3						
Residential mortgage	**260**	**61**	**199**	139	29	110
Personal	**166**	**75**	**91**	116	63	53
Credit card[1]	**–**	**–**	**–**	–	–	–
Business and government[2]	**386**	**197**	**189**	407	287	120
	812	**333**	**479**	662	379	283
Loans – POCI	**459**	**(92)**	**551**	464	(89)	553
	1,271	**241**	**1,030**	1,126	290	836

(1) Credit card receivables are considered impaired, at the latest, when payment is 180 days past due, and they are written off at that time.
(2) Includes customers' liability under acceptances.

Maximum Exposure to Credit Risk of Impaired Loans

The following table presents the maximum exposure to credit risk of impaired loans, the percentage of exposure covered by guarantees, and the main types of collateral and guarantees held for each loan category.

As at October 31		2022		2021	
	Gross impaired loans	Percentage covered by guarantees[1]	Gross impaired loans	Percentage covered by guarantees[1]	Types of collateral and guarantees
Loans – Stage 3					
Residential mortgage	**260**	**100 %**	139	100 %	Residential buildings
Personal	**166**	**56 %**	116	47 %	Buildings, land and automobiles
Business and government[2]	**386**	**59 %**	407	62 %	Buildings, land, equipment, government and bank guarantees
Loans – POCI	**459**	**52 %**	464	36 %	Buildings and automobiles

(1) For gross impaired loans, the ratio is calculated on a weighted average basis using the estimated value of the collateral and guarantees held for each loan category presented. The value of the collateral and guarantees held for a specific loan may exceed the balance of the loan; when this is the case, the ratio is capped at 100%.
(2) Includes customers' liability under acceptances.

Allowances for Credit Losses

The following tables present a reconciliation of the allowances for credit losses by Consolidated Balance Sheet item and by type of off-balance-sheet commitment.

						Year ended October 31, 2022
	Allowances for credit losses as at October 31, 2021	Provisions for credit losses	Write-offs[1]	Disposals	Recoveries and other	Allowances for credit losses as at October 31, 2022
Balance sheet						
Cash and deposits with financial institutions[2][3]	5	–	–	–	–	5
Securities[3]						
At fair value through other comprehensive income[4]	1	1	–	–	–	2
At amortized cost[2]	3	4	–	–	–	7
Securities purchased under reverse repurchase agreements and securities borrowed[2][3]	–	–	–	–	–	–
Loans[5]						
Residential mortgage	71	46	(3)	–	4	118
Personal	202	69	(52)	–	20	239
Credit card	122	49	(62)	–	17	126
Business and government	515	10	(116)	–	9	418
Customers' liability under acceptances	88	(34)	–	–	–	54
	998	140	(233)	–	50	955
Other assets[2][3]	–	–	–	–	–	–
Off-balance-sheet commitments[6]						
Letters of guarantee and documentary letters of credit	13	–	–	–	–	13
Undrawn commitments	143	–	–	–	–	143
Backstop liquidity and credit enhancement facilities	6	–	–	–	–	6
	162	–	–	–	–	162
	1,169	145	(233)	–	50	1,131

						Year ended October 31, 2021
	Allowances for credit losses as at October 31, 2020	Provisions for credit losses	Write-offs[1]	Disposals	Recoveries and other	Allowances for credit losses as at October 31, 2021
Balance sheet						
Cash and deposits with financial institutions[2][3]	5	–	–	–	–	5
Securities[3]						
At fair value through other comprehensive income[4]	3	(2)	–	–	–	1
At amortized cost[2]	1	2	–	–	–	3
Securities purchased under reverse repurchase agreements and securities borrowed[2][3]	–	–	–	–	–	–
Loans[5]						
Residential mortgage	65	12	(6)	–	–	71
Personal	298	(29)	(69)	(14)	16	202
Credit card	169	(5)	(59)	–	17	122
Business and government	533	43	(58)	–	(3)	515
Customers' liability under acceptances	93	(5)	–	–	–	88
	1,158	16	(192)	(14)	30	998
Other assets[2][3]	–	–	–	–	–	–
Off-balance-sheet commitments[6]						
Letters of guarantee and documentary letters of credit	15	(2)	–	–	–	13
Undrawn commitments	157	(14)	–	–	–	143
Backstop liquidity and credit enhancement facilities	4	2	–	–	–	6
	176	(14)	–	–	–	162
	1,343	2	(192)	(14)	30	1,169

(1) The contractual amount outstanding on financial assets that were written off during the year ended October 31, 2022 and that are still subject to enforcement activity was $91 million ($105 million for the year ended October 31, 2021).
(2) These financial assets are presented net of the allowances for credit losses on the Consolidated Balance Sheet.
(3) As at October 31, 2022 and 2021, these financial assets were mainly classified in Stage 1 and their credit quality fell mostly within the *Excellent* category.
(4) The allowances for credit losses are reported in the *Accumulated other comprehensive income* item of the Consolidated Balance Sheet.
(5) The allowances for credit losses are reported in the *Allowances for credit losses* item of the Consolidated Balance Sheet.
(6) The allowances for credit losses are reported in the *Other liabilities* item of the Consolidated Balance Sheet.

Note 7 – Loans and Allowances for Credit Losses (cont.)

The following tables present the reconciliation of allowances for credit losses for each loan category at amortized cost according to ECL impairment stage.

Year ended October 31					2022					2021
	Allowances for credit losses on non-impaired loans		Allowances for credit losses on impaired loans			Allowances for credit losses on non-impaired loans		Allowances for credit losses on impaired loans		
	Stage 1	Stage 2	Stage 3	POCI[1]	Total	Stage 1	Stage 2	Stage 3	POCI[1]	Total
Residential mortgage										
Balance at beginning	50	52	29	(60)	71	63	23	35	(56)	65
Originations or purchases	19	–	–	–	19	12	–	–	–	12
Transfers[2]:										
to Stage 1	19	(17)	(2)	–	–	18	(13)	(5)	–	–
to Stage 2	(10)	13	(3)	–	–	(4)	5	(1)	–	–
to Stage 3	(1)	(7)	8	–	–	–	(1)	1	–	–
Net remeasurement of loss allowances[3]	(24)	39	29	(9)	35	(33)	39	6	(7)	5
Derecognitions[4]	(3)	(3)	(3)	–	(9)	(3)	(1)	(1)	–	(5)
Changes to models	–	1	–	–	1	–	–	–	–	–
Provisions for credit losses	–	26	29	(9)	46	(10)	29	–	(7)	12
Write-offs	–	–	(3)	–	(3)	–	–	(6)	–	(6)
Disposals	–	–	–	–	–	–	–	–	–	–
Recoveries	–	–	3	–	3	–	–	2	–	2
Foreign exchange movements and other	3	2	3	(7)	1	(3)	–	(2)	3	(2)
Balance at end	53	80	61	(76)	118	50	52	29	(60)	71
Includes:										
Amounts drawn	53	80	61	(76)	118	50	52	29	(60)	71
Undrawn commitments[5]	–	–	–	–	–	–	–	–	–	–
Personal										
Balance at beginning	73	103	63	(29)	210	89	148	76	(10)	303
Originations or purchases	45	–	–	–	45	41	–	–	–	41
Transfers[2]:										
to Stage 1	61	(56)	(5)	–	–	73	(66)	(7)	–	–
to Stage 2	(21)	23	(2)	–	–	(12)	14	(2)	–	–
to Stage 3	–	(31)	31	–	–	–	(27)	27	–	–
Net remeasurement of loss allowances[3]	(72)	85	28	15	56	(96)	58	19	(19)	(38)
Derecognitions[4]	(9)	(15)	(5)	–	(29)	(12)	(15)	(2)	–	(29)
Changes to models	(10)	6	–	–	(4)	–	–	–	–	–
Provisions for credit losses	(6)	12	47	15	68	(6)	(36)	35	(19)	(26)
Write-offs	–	–	(52)	–	(52)	–	–	(69)	–	(69)
Disposals	–	–	–	–	–	(8)	(6)	–	–	(14)
Recoveries	–	–	17	–	17	–	–	21	–	21
Foreign exchange movements and other	3	2	–	(2)	3	(2)	(3)	–	–	(5)
Balance at end	70	117	75	(16)	246	73	103	63	(29)	210
Includes:										
Amounts drawn	67	113	75	(16)	239	70	98	63	(29)	202
Undrawn commitments[5]	3	4	–	–	7	3	5	–	–	8

(1) The total amount of undiscounted initially expected credit losses on the POCI loans acquired during the year ended October 31, 2022 was $15 million ($11 million for the year ended October 31, 2021). The expected credit losses reflected in the purchase price have been discounted.
(2) Represent stage transfers deemed to have taken place at the beginning of the quarter in which the transfer occurred.
(3) Includes the net remeasurement of loss allowances (after transfers) attributable mainly to changes in volumes and in the credit quality of existing loans as well as to changes in risk parameters.
(4) Represent reversals to loss allowances arising from full loan repayments (excluding write-offs and disposals).
(5) The allowances for credit losses on undrawn commitments are reported in the *Other liabilities* item of the Consolidated Balance Sheet.

Year ended October 31					2022					2021
	Allowances for credit losses on non-impaired loans		Allowances for credit losses on impaired loans			Allowances for credit losses on non-impaired loans		Allowances for credit losses on impaired loans		
	Stage 1	Stage 2	Stage 3	POCI[1]	Total	Stage 1	Stage 2	Stage 3	POCI[1]	Total
Credit card										
Balance at beginning	57	101	–	–	158	68	137	–	–	205
Originations or purchases	12	–	–	–	12	10	–	–	–	10
Transfers[2]:										
to Stage 1	84	(84)	–	–	–	100	(100)	–	–	–
to Stage 2	(16)	16	–	–	–	(15)	15	–	–	–
to Stage 3	(1)	(23)	24	–	–	(1)	(29)	30	–	–
Net remeasurement of loss allowances[3]	(80)	104	21	–	45	(100)	84	12	–	(4)
Derecognitions[4]	(2)	(1)	–	–	(3)	(2)	(2)	–	–	(4)
Changes to models	(1)	(1)	–	–	(2)	(3)	(4)	–	–	(7)
Provisions for credit losses	(4)	11	45	–	52	(11)	(36)	42	–	(5)
Write-offs	–	–	(62)	–	(62)	–	–	(59)	–	(59)
Disposals	–	–	–	–	–	–	–	–	–	–
Recoveries	–	–	17	–	17	–	–	17	–	17
Foreign exchange movements and other	–	–	–	–	–	–	–	–	–	–
Balance at end	53	112	–	–	165	57	101	–	–	158
Includes:										
Amounts drawn	31	95	–	–	126	33	89	–	–	122
Undrawn commitments[5]	22	17	–	–	39	24	12	–	–	36
Business and government[6]										
Balance at beginning	177	238	287	–	702	214	287	241	–	742
Originations or purchases	82	–	–	–	82	116	–	–	–	116
Transfers[2]:										
to Stage 1	67	(65)	(2)	–	–	60	(58)	(2)	–	–
to Stage 2	(27)	31	(4)	–	–	(43)	48	(5)	–	–
to Stage 3	–	(3)	3	–	–	–	(21)	21	–	–
Net remeasurement of loss allowances[3]	(93)	21	24	–	(48)	(131)	24	98	–	(9)
Derecognitions[4]	(29)	(27)	(4)	–	(60)	(38)	(42)	(6)	–	(86)
Changes to models	–	–	–	–	–	–	–	–	–	–
Provisions for credit losses	–	(43)	17	–	(26)	(36)	(49)	106	–	21
Write-offs	–	–	(116)	–	(116)	–	–	(58)	–	(58)
Disposals	–	–	–	–	–	–	–	–	–	–
Recoveries	–	–	3	–	3	–	–	4	–	4
Foreign exchange movements and other	–	–	6	–	6	(1)	–	(6)	–	(7)
Balance at end	177	195	197	–	569	177	238	287	–	702
Includes:										
Amounts drawn	115	160	197	–	472	111	205	287	–	603
Undrawn commitments[5]	62	35	–	–	97	66	33	–	–	99
Total allowances for credit losses at end[7]	353	504	333	(92)	1,098	357	494	379	(89)	1,141
Includes:										
Amounts drawn	266	448	333	(92)	955	264	444	379	(89)	998
Undrawn commitments[5]	87	56	–	–	143	93	50	–	–	143

(1) The total amount of undiscounted initially expected credit losses on the POCI loans acquired during the year ended October 31, 2022 was $15 million ($11 million for the year ended October 31, 2021). The expected credit losses reflected in the purchase price have been discounted.
(2) Represent stage transfers deemed to have taken place at the beginning of the quarter in which the transfer occurred.
(3) Includes the net remeasurement of loss allowances (after transfers) attributable mainly to changes in volumes and in the credit quality of existing loans as well as to changes in risk parameters.
(4) Represent reversals to loss allowances arising from full loan repayments (excluding write-offs and disposals).
(5) The allowances for credit losses on undrawn commitments are reported in the *Other liabilities* item of the Consolidated Balance Sheet.
(6) Includes customers' liability under acceptances.
(7) Excludes allowances for credit losses on other financial assets at amortized cost and on off-balance-sheet commitments other than undrawn commitments.

Note 7 – Loans and Allowances for Credit Losses (cont.)

Distribution of Gross and Impaired Loans by Borrower Category Under the Basel Asset Classes

	2022					2021				
	As at October 31			Year ended October 31		As at October 31			Year ended October 31	
	Gross loans[1]	Impaired loans[1]	Allowances for credit losses on impaired loans[1][2]	Provisions for credit losses	Write-offs	Gross loans[1]	Impaired loans[1]	Allowances for credit losses on impaired loans[1][2]	Provisions for credit losses	Write-offs
Retail										
Residential mortgage[3]	95,575	299	64	31	4	89,035	153	31	(2)	6
Qualifying revolving retail[4]	3,801	16	12	54	72	3,589	12	10	48	77
Other retail[5]	14,899	102	58	36	41	12,949	67	49	32	51
	114,275	417	134	121	117	105,573	232	90	78	134
Non-retail										
Agriculture	8,109	31	2	(1)	–	7,357	30	4	(5)	1
Oil and gas[6]	1,435	6	6	(19)	26	1,807	55	49	3	9
Mining	1,049	11	4	4	–	529	–	–	–	–
Utilities[6]	9,682	35	35	(2)	59	7,687	102	93	73	–
Non-real-estate construction[7]	1,935	38	32	5	–	1,541	37	27	11	–
Manufacturing[6]	7,374	21	10	(4)	14	5,720	40	25	3	2
Wholesale	3,241	35	26	2	–	2,598	29	23	10	3
Retail	3,494	30	19	2	–	2,978	27	18	2	1
Transportation	2,209	8	7	–	–	1,811	8	7	–	–
Communications	1,830	11	10	2	–	1,441	19	8	2	10
Financial services[6]	10,777	5	3	–	–	8,870	7	2	1	–
Real estate services and real estate construction[8]	22,382	26	6	1	12	18,195	36	16	1	2
Professional services	2,338	9	4	–	1	1,872	8	4	–	5
Education and health care	3,412	108	25	25	2	4,073	5	3	5	4
Other services	6,247	20	9	2	2	5,875	26	9	(1)	21
Government	1,661	–	–	–	–	1,159	–	–	–	–
Other[6]	5,790	1	1	–	–	4,137	1	1	–	–
	92,965	395	199	17	116	77,650	430	289	105	58
Excluding POCI loans	207,240	812	333	138	233	183,223	662	379	183	192
POCI	459	459	(92)	6		464	464	(89)	(26)	
	207,699	1,271	241	144	233	183,687	1,126	290	157	192
Stages 1 and 2[9]				1					(155)	
				145	233				2	192

(1) Includes customers' liability under acceptances.
(2) Allowances for credit losses on drawn amounts.
(3) Includes residential mortgages on one-to-four-unit dwellings (Basel definition) and home equity lines of credit.
(4) Includes lines of credit and credit card receivables.
(5) Includes consumer loans and other retail loans but excludes SME loans.
(6) In fiscal 2022, the presentation was changed to better align borrower categories with their definitions. Comparative figures have been reclassified.
(7) Includes civil engineering loans, public-private partnership loans, and project finance loans.
(8) Includes residential mortgages on dwellings of five or more units and SME loans.
(9) Includes provisions for credit losses on other financial assets at amortized cost and on off-balance-sheet commitments.

Main Macroeconomic Factors

The following tables show the main macroeconomic factors used to estimate the allowances for credit losses on loans. For each scenario, namely, the base scenario, upside scenario, and downside scenario, the average values of the macroeconomic factors over the next 12 months (used for Stage 1 credit loss calculations) and over the remaining forecast period (used for Stage 2 credit loss calculations) are presented.

						As at October 31, 2022
	Base scenario		Upside scenario		Downside scenario	
	Next 12 months	Remaining forecast period	Next 12 months	Remaining forecast period	Next 12 months	Remaining forecast period
Macroeconomic factors[1]						
GDP growth[2]	0.6 %	1.7 %	1.1 %	1.6 %	(5.2) %	2.9 %
Unemployment rate	6.0 %	6.1 %	5.4 %	5.4 %	7.4 %	6.4 %
Housing price index growth[2]	(11.2) %	0.7 %	– %	0.2 %	(13.9) %	0.3 %
BBB spread[3]	2.4 %	2.1 %	2.0 %	1.9 %	3.4 %	2.6 %
S&P/TSX growth[2][4]	(4.3) %	2.4 %	5.1 %	2.6 %	(25.6) %	5.5 %
WTI oil price[5] *(US$ per barrel)*	78	77	102	97	44	51

						As at October 31, 2021
	Base scenario		Upside scenario		Downside scenario	
	Next 12 months	Remaining forecast period	Next 12 months	Remaining forecast period	Next 12 months	Remaining forecast period
Macroeconomic factors[1]						
GDP growth[2]	4.2 %	1.6 %	4.7 %	1.9 %	(5.5) %	3.7 %
Unemployment rate	6.6 %	6.3 %	6.3 %	5.6 %	9.5 %	7.8 %
Housing price index growth[2]	2.0 %	0.2 %	4.0 %	1.9 %	(11.5) %	1.2 %
BBB spread[3]	1.7 %	1.9 %	1.6 %	1.7 %	3.1 %	2.2 %
S&P/TSX growth[2][4]	4.8 %	2.1 %	8.6 %	3.1 %	(25.6) %	5.5 %
WTI oil price[5] *(US$ per barrel)*	70	65	77	77	35	34

(1) All macroeconomic factors are based on the Canadian economy unless otherwise indicated.
(2) Growth rate is annualized.
(3) Yield on corporate BBB bonds less yield on Canadian federal government bonds with a 10-year maturity.
(4) Main stock index in Canada.
(5) The West Texas Intermediate (WTI) index is commonly used as a benchmark for the price of oil.

The main macroeconomic factors used for the personal credit portfolio are unemployment rate and growth in the housing price index, based on the economy of Canada or Quebec. The main macroeconomic factors used for the business and government credit portfolio are unemployment rate, spread on corporate BBB bonds, S&P/TSX growth, and WTI oil price.

An increase in unemployment rate or BBB spread will generally lead to higher allowances for credit losses, whereas an increase in the other macroeconomic factors (GDP, S&P/TSX, housing price index, and WTI oil price) will generally lead to lower allowances for credit losses.

Note 7 – Loans and Allowances for Credit Losses (cont.)

During the year ended October 31, 2022, the macroeconomic outlook generally deteriorated.

In the base scenario, the global economy faces a cycle of synchronized monetary tightening designed to curb inflation in a still uncertain geopolitical environment. The Canadian economy is relatively well positioned thanks to a resource sector that is benefitting from higher commodity prices. However, as is the case in other countries, higher interest rates slow the economy. The labour market already shows signs of cooling, and lower hiring intentions do not point to a short-term turnaround. In the housing resale market, a noticeable downtrend persists and home prices continue to decline. In such a scenario, inflation decelerates significantly, enabling the central bank to cease raising its policy rate. All in all, a significant economic slowdown occurs in the coming quarters, as consumers simultaneously deal with a loss in purchasing power, a negative wealth effect, and interest payment shock. After 12 months, the unemployment rate rises a full percentage point to 6.2%. Housing prices slide 11.2% year over year, the S&P/TSX is at 18,500 points after one year, and the price of oil hovers around US$77.

In the upside scenario, the economy surprises slightly in a positive direction owing to a resilient labour market. Governments continue to support the Canadian and U.S. economies. Consumer spending also surprises to the upside given the excess savings accumulated since the start of the pandemic. While the economy remains solid, the central bank does not need to significantly tighten monetary policy as inflation stabilizes given a normalization of supply chains and easing geopolitical tensions. After one year, the unemployment rate is more favourable than that of the base scenario (seven-tenths lower). Housing prices remain unchanged, the S&P/TSX is at 20,300 points after one year, and the price of oil hovers around US$102.

In the downside scenario, supply chain issues persist and the geopolitical landscape remains highly uncertain. The global economy stagnates with several countries seeing a drop in economic activity. In addition, central banks underestimated the impact of rising interest rates in a context of persistent supply shock. Given budgetary constraints, governments have a limited capacity to support households and businesses. After 12 months, the economic contraction pushes the unemployment rate to 8.2%. Housing prices decrease considerably, the S&P/TSX slides to 14,380 points after one year, and the price of oil falls to US$36.

Given uncertainty surrounding the key inputs used to measure credit losses, the Bank has applied expert credit judgment to adjust the modelled ECL results.

Sensitivity Analysis of Allowances for Credit Losses on Non-Impaired Loans

Scenarios

The following table shows a comparison of the Bank's allowances for credit losses on non-impaired loans (Stages 1 and 2) as at October 31, 2022 based on the probability weightings of three scenarios with allowances for credit losses resulting from simulations of each scenario weighted at 100%.

	Allowances for credit losses on non-impaired loans
Balance as at October 31, 2022	**857**
Simulations	
100% upside scenario	603
100% base scenario	693
100% downside scenario	1,123

Migration

The following table shows a comparison of the Bank's allowances for credit losses on non-impaired loans (Stages 1 and 2) as at October 31, 2022 with the estimated allowances for credit losses that would result if all these non-impaired loans were in Stage 1.

	Allowances for credit losses on non-impaired loans
Balance as at October 31, 2022	**857**
Simulations	
Non-impaired loans if they were all in Stage 1	664

Note 8 – Financial Assets Transferred But Not Derecognized

In the normal course of its business, the Bank enters into transactions in which it transfers financial assets such as securities or loans directly to third parties, in particular structured entities. According to the terms of some of those transactions, the Bank retains substantially all of the risks and rewards related to those financial assets. The risks include credit risk, interest rate risk, foreign exchange risk, prepayment risk, and other price risks, whereas the rewards include the income streams associated with the financial assets. As such, those financial assets are not derecognized and the transactions are treated as collateralized or secured borrowings. The nature of those transactions is described below.

Securities Sold Under Repurchase Agreements and Securities Loaned

When securities are sold under repurchase agreements and securities loaned under securities lending agreements, the Bank transfers financial assets to third parties in accordance with the standard terms for such transactions. These third parties may have an unlimited right to resell or repledge the financial assets received. If cash collateral is received, the Bank records the cash along with an obligation to return the cash, which is included in *Obligations related to securities sold under repurchase agreements and securities loaned* on the Consolidated Balance Sheet. Where securities are received as collateral, the Bank does not record the collateral on the Consolidated Balance Sheet.

Financial Assets Transferred to Structured Entities

Under the Canada Mortgage Bond (CMB) program, the Bank sells securities backed by insured residential mortgages and other securities to Canada Housing Trust (CHT), which finances the purchase through the issuance of insured mortgage bonds. Third-party CMB investors have legal recourse only to the transferred assets. The cash received for these transferred assets is treated as a secured borrowing, and a corresponding liability is recorded in *Liabilities related to transferred receivables* on the Consolidated Balance Sheet.

The following table provides additional information about the nature of the transferred financial assets that do not qualify for derecognition and the associated liabilities.

As at October 31	2022	2021
Carrying value of financial assets transferred but not derecognized		
Securities[1]	76,551	68,296
Residential mortgages	24,102	22,413
	100,653	90,709
Carrying value of associated liabilities[2]	56,555	40,779
Fair value of financial assets transferred but not derecognized		
Securities[1]	76,551	68,296
Residential mortgages	22,954	22,249
	99,505	90,545
Fair value of associated liabilities[2]	55,767	40,731

(1) The amount related to the securities loaned is the maximum amount of Bank securities that can be lent. For obligations related to securities sold under repurchase agreements, the amount includes the Bank's own financial assets as well as those of third parties and excludes covered bonds issued by the Bank.

(2) Associated liabilities include liabilities related to transferred receivables and obligations related to securities sold under repurchase agreements before the offsetting impact of $3,606 million as at October 31, 2022 ($3,367 million as at October 31, 2021) excluding repurchase agreements guaranteed by covered bonds issued by the Bank. Liabilities related to securities loaned are not included, as the Bank can lend its own financial assets and those of third parties. The carrying value and fair value of liabilities related to securities loaned stood at $8,843 million before the offsetting impact of $2,043 million as at October 31, 2022 ($7,993 million before the offsetting impact of $4,333 million as at October 31, 2021).

The following table specifies the nature of the transactions related to financial assets transferred but not derecognized.

As at October 31	2022	2021
Carrying value of financial assets transferred but not derecognized		
Securities backed by insured residential mortgages and other securities sold to CHT	25,468	24,034
Securities sold under repurchase agreements	33,880	17,553
Securities loaned	41,305	49,122
	100,653	90,709

Note 9 – Investments in Associates and Joint Ventures

As at October 31		2022	2021
	Business segment	Carrying value	Carrying value
Listed associate			
TMX Group Limited[(1)]	Other	96	184
Unlisted associates		44	41
		140	225

(1) The Bank exercises significant influence over TMX Group Limited (TMX) mainly through its equity interest, debt financing, and presence on TMX's board of directors. As at October 31, 2022, the Bank's ownership interest in TMX was 2.5% (5.2% as at October 31, 2021), and the fair value of this investment based on quoted prices in active markets was $178 million ($390 million as at October 31, 2021).

As at October 31, 2022 and 2021, there were no significant restrictions limiting the ability of associates to transfer funds to the Bank in the form of dividends or to repay any loans or advances. Furthermore, the Bank has not made any specific commitment or contracted any contingent liability with respect to associates.

TMX Group Limited

TMX is a Canadian corporation that directly or indirectly controls a number of entities that operate stock exchanges and clearing houses and provide clearing and settlement services. During the year ended October 31, 2022, TMX paid $7 million in dividends to the Bank ($12 million for the year ended October 31, 2021). The following table provides summarized financial information on TMX.

As at October 31 or for the year ended October 31[(1)]	2022	2021
Balance sheet		
Current assets	56,811	36,077
Non-current assets	5,671	5,387
Current liabilities	56,382	35,817
Non-current liabilities	1,992	1,971
Income statement		
Total revenues	1,095	948
Net income	559	322
Other comprehensive income	(49)	(1)
Comprehensive income	510	321

(1) The balance sheet amounts are the balances reported in the unaudited financial statements as at September 30, 2022 and 2021, i.e., the most recent available, and the income statement amounts are based on the cumulative balances for the 12-month periods ended September 30, 2022 and 2021.

The table below provides summarized financial information related to the Bank's proportionate share in all unlisted associates that are not individually significant.

Year ended October 31[(1)]	2022	2021
Net income	5	1
Other comprehensive income	–	–
Comprehensive income	5	1

(1) The amounts are based on the cumulative balances for the 12-month periods ended September 30, 2022 and 2021.

Note 10 – Premises and Equipment

	Owned assets held							Right-of-use assets	Total
	Land	Head office building under construction[1]	Buildings	Computer equipment	Equipment and furniture	Leasehold improvements	Total	Real estate	
Cost									
As at October 31, 2020	71	120	71	340	112	331	1,045	698	1,743
Additions and modifications	–	128	6	44	13	32	223	48	271
Disposals	–	–	(3)	(3)	(2)	(4)	(12)		(12)
Impairment losses	–	–	–	–	–	–	–	(5)	(5)
Fully depreciated assets			(6)	(124)	(10)	(18)	(158)	(3)	(161)
Impact of foreign currency translation	–	–	–	(2)	(3)	(3)	(8)	(6)	(14)
As at October 31, 2021	71	248	68	255	110	338	1,090	732	1,822
Additions and modifications	3	183	2	53	14	46	301	69	370
Disposals	–	–	(7)	–	(3)	(2)	(12)		(12)
Fully depreciated assets			(7)	(38)	(7)	(10)	(62)	(8)	(70)
Impact of foreign currency translation	–	–	–	6	3	5	14	12	26
As at October 31, 2022	**74**	**431**	**56**	**276**	**117**	**377**	**1,331**	**805**	**2,136**
Accumulated amortization									
As at October 31, 2020			54	230	56	149	489	99	588
Depreciation for the year			2	48	12	30	92	103	195
Disposals			(3)	(3)	(2)	(4)	(12)		(12)
Impairment losses			–	–	–	–	–	(1)	(1)
Fully depreciated assets			(6)	(124)	(10)	(18)	(158)	(3)	(161)
Impact of foreign currency translation			–	(1)	(1)	(1)	(3)	–	(3)
As at October 31, 2021			47	150	55	156	408	198	606
Depreciation for the year			2	48	15	32	97	105	202
Disposals			(4)	–	(3)	(2)	(9)		(9)
Fully depreciated assets			(7)	(38)	(7)	(10)	(62)	(8)	(70)
Impact of foreign currency translation			–	2	1	3	6	4	10
As at October 31, 2022			**38**	**162**	**61**	**179**	**440**	**299**	**739**
Carrying value as at October 31, 2021	71	248	21	105	55	182	682	534	1,216
Carrying value as at October 31, 2022	**74**	**431**	**18**	**114**	**56**	**198**	**891**	**506**	**1,397**

(1) As at October 31, 2022, contractual commitments related to the head office building under construction stood at $197 million, covering a period up to 2023.

Assets Leased Under Operating Leases

The Bank is a lessor under operating lease agreements for certain buildings. These leases have terms varying from one year to five years and do not contain any bargain purchase options or contingent rent.

The following table breaks down the future minimum payments receivable under these operating leases. These amounts include sublease revenues of $6 million related to real estate right-of-use assets.

	As at October 31, 2022
1 year or less	2
Over 1 year to 2 years	2
Over 2 years to 3 years	1
Over 3 years to 4 years	1
Over 4 years to 5 years	1
Over 5 years	–
	7

Note 10 – Premises and Equipment (cont.)

Leases Recognized in the Consolidated Statement of Income

	As at October 31, 2022
Interest expense	16
Expense for leases of low-value assets[1]	9
Expense relating to variable lease payments	94
Income from leasing and subleasing[2]	4

(1) The expense relates to lease payments for low-value assets that are part of the exemptions permitted by the practical expedients of IFRS 16.
(2) This amount includes variable lease payments of $2 million.

For the year ended October 31, 2022, the cash outflows for leases amounted to $218 million (2021: $214 million).

Note 11 – Goodwill and Intangible Assets

Goodwill

The following table presents changes in the carrying amounts of goodwill by cash-generating unit (CGU) and by business segment for the years ended October 31, 2022 and 2021.

	Personal and Commercial[1]	Wealth Management				Financial Markets[1]	USSF&I			Other	Total
		Third-Party Solutions[1]	Securities Brokerage[1]	Managed Solutions[1]	Total		Credigy Ltd.[1]	Advanced Bank of Asia Limited[1]	Total	Flinks Technology Inc.[1]	
Balance as at October 31, 2020	54	256	434	269	959	235	33	133	166	–	1,414
Acquisition of Flinks[2]										101	101
Impact of foreign currency translation	–	–	–	–	–	–	(2)	(9)	(11)	–	(11)
Balance as at October 31, 2021	54	256	434	269	959	235	31	124	155	101	1,504
Impact of foreign currency translation	–	–	–	–	–	–	3	12	15	–	15
Balance as at October 31, 2022	**54**	**256**	**434**	**269**	**959**	**235**	**34**	**136**	**170**	**101**	**1,519**

(1) Constitutes a CGU.
(2) On September 8, 2021, the Bank finalized the acquisition of Flinks. For additional information, see Note 31 to these consolidated financial statements.

Goodwill Impairment Testing and Significant Assumptions
For impairment testing purposes, goodwill resulting from a business combination must be allocated, as of the acquisition date, to a CGU or group of CGUs expected to benefit from the synergies of the business combination. Goodwill is tested for impairment annually or more frequently if events or circumstances indicate that the recoverable value of the CGU or group of CGUs may have fallen below its carrying amount.

Goodwill was tested for impairment during the years ended October 31, 2022 and 2021, and no impairment loss was recognized.

The recoverable value of a CGU or group of CGUs is based on the value in use that is calculated based on discounted pre-tax cash flows. Future pre-tax cash flows are estimated based on a five-year period, which is the reference period used for the most recent financial forecasts approved by management. Cash flows beyond that period are extrapolated using a long-term growth rate.

The discount rate used for each CGU or group of CGUs is calculated using the cost of debt financing and the cost related to the Bank's equity. This rate corresponds to the Bank's weighted average cost of capital and reflects the risk specific to the CGU. The long-term growth rate used in calculating discounted cash flow estimates is based on the forecasted growth rate plus a risk premium. The rate is constant over the entire five-year period for which the cash flows were determined. Growth rates are determined, among other factors, based on past growth rates, economic trends, inflation, competition and the impact of the Bank's strategic initiatives. As at October 31, 2022, for each CGU or CGU group, the discount rate used was 12.9% (13.2% as at October 31, 2021), and the long-term growth rate varied between 2% and 5%, depending on the CGU, as at October 31, 2022 and 2021.

Estimating a CGU's value in use requires significant judgment regarding the inputs used in applying the discounted cash flow method. The Bank conducts sensitivity analyses by varying the after-tax discount rate upward by 1% and the terminal growth rates downward by 1%. Such sensitivity analyses demonstrate that a reasonable change in assumptions would not result in a CGU's carrying value exceeding its value in use.

Intangible Assets

	Indefinite useful life			Finite useful life				Total
	Management contracts[1]	Trademark	Total	Internally-generated software[2]	Other software	Other intangible assets	Total	
Cost								
As at October 31, 2020	161	11	172	1,922	169	69	2,160	2,332
Impact of an accounting policy change as at November 1, 2020[3]				(192)			(192)	(192)
Acquisitions	–	–	–	354	20	–	374	374
Impact of an accounting policy change for the fiscal year[3]				(75)			(75)	(75)
Impairment losses[4]	(1)	(2)	(3)	(9)	–	–	(9)	(12)
Fully amortized intangible assets				(92)	(69)	(5)	(166)	(166)
As at October 31, 2021	160	9	169	1,908	120	64	2,092	2,261
Acquisitions	**–**	**–**	**–**	**346**	**28**	**–**	**374**	**374**
Impairment losses[4]	**(1)**	**(1)**	**(2)**	**(7)**	**–**	**(2)**	**(9)**	**(11)**
Fully amortized intangible assets				**(138)**	**(21)**	**(2)**	**(161)**	**(161)**
Impact of foreign currency translation	**–**	**–**	**–**	**–**	**1**	**–**	**1**	**1**
As at October 31, 2022	**159**	**8**	**167**	**2,109**	**128**	**60**	**2,297**	**2,464**
Accumulated amortization								
As at October 31, 2020				724	125	49	898	898
Impact of an accounting policy change as at November 1, 2020[3]				(6)			(6)	(6)
Amortization for the fiscal year				260	19	7	286	286
Impact of an accounting policy change for the fiscal year[3]				(25)			(25)	(25)
Fully amortized intangible assets				(92)	(69)	(5)	(166)	(166)
As at October 31, 2021				861	75	51	987	987
Amortization for the fiscal year				**253**	**20**	**6**	**279**	**279**
Impairment losses[4]				**(2)**	**–**	**(1)**	**(3)**	**(3)**
Fully amortized intangible assets				**(138)**	**(21)**	**(2)**	**(161)**	**(161)**
Impact of foreign currency translation				**–**	**2**	**–**	**2**	**2**
As at October 31, 2022				**974**	**76**	**54**	**1,104**	**1,104**
Carrying value as at October 31, 2021	160	9	169	1,047	45	13	1,105	1,274
Carrying value as at October 31, 2022	**159**	**8**	**167**	**1,135**	**52**	**6**	**1,193**	**1,360**

(1) For annual impairment testing purposes, management contracts are allocated to the Managed Solutions CGU.
(2) The remaining amortization period for significant internally-generated software is four years.
(3) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these consolidated financial statements.
(4) During the year ended October 31, 2022, the Bank recorded $2 million in impairment losses resulting from the impairment test carried out on indefinite-life intangible assets ($3 million during the year ended October 31, 2021) as well as an amount of $5 million related to internally-generated software for which the Bank has decided to cease its use or development ($9 million during the year ended October 31, 2021). These impairment losses were recognized in the *Non-interest expenses – Technology* item of the Consolidated Statement of Income and reported in the *Other* heading of segment results.

Note 12 – Other Assets

As at October 31	2022	2021[1]
Receivables, prepaid expenses and other items	2,591	1,228
Interest and dividends receivable	1,057	696
Due from clients, dealers and brokers	842	988
Defined benefit asset (Note 23)	498	691
Deferred tax assets (Notes 1 and 24)	389	416
Current tax assets	471	445
Reinsurance assets	6	28
Insurance assets	104	38
	5,958	4,530

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these consolidated financial statements.

Note 13 – Deposits

As at October 31				2022	2021
	On demand[1]	After notice[2]	Fixed term[3]	Total	Total
Personal	5,539	36,576	36,696	78,811	70,076
Business and government	60,579	32,061	91,590	184,230	167,870
Deposit-taking institutions	1,557	199	1,597	3,353	2,992
	67,675	68,836	129,883	266,394	240,938

(1) Demand deposits are deposits for which the Bank does not have the right to require notice of withdrawal and consist essentially of deposits in chequing accounts.
(2) Notice deposits are deposits for which the Bank may legally require a notice of withdrawal and consist mainly of deposits in savings accounts.
(3) Fixed-term deposits are deposits that can be withdrawn by the holder on a specified date and include term deposits, guaranteed investment certificates, savings accounts and plans, covered bonds, and other similar instruments.

The *Deposits – Business and government* item includes, among other items, covered bonds, as described below, and a $13.9 billion amount of deposits as at October 31, 2022 ($11.9 billion as at October 31, 2021) that are subject to the bank bail-in conversion regulations issued by the Government of Canada. These regulations provide certain powers to the Canada Deposit Insurance Corporation (CDIC), notably the power to convert certain eligible Bank shares and liabilities into common shares should the Bank become non-viable.

Covered Bonds

NBC Covered Bond Guarantor (Legislative) Limited Partnership

In December 2013, the Bank established the covered bond legislative program under which covered bonds are issued. It therefore created NBC Covered Bond Guarantor (Legislative) Limited Partnership (the Guarantor) to guarantee payment of the principal and interest owed to the bondholders. The Bank sold uninsured residential mortgages to the Guarantor and granted it loans to facilitate the acquisition of these assets. During the year ended October 31, 2022, an amount of 1.0 billion euros and US$1.0 billion in covered bonds reached maturity, and the Bank issued 1.3 billion euros, US$1.5 billion, and 750 million pounds sterling in covered bonds (US$470 million, 1.0 billion euros, and 250 million pounds sterling in covered bonds reached maturity, and the Bank issued 1.25 billion euros in covered bonds during the year ended October 31, 2021). The covered bonds totalled $10.4 billion as at October 31, 2022 ($8.8 billion as at October 31, 2021). For additional information, see Note 27 to these consolidated financial statements.

The Bank has limited access to the assets owned by this structured entity according to the terms of the agreements that apply to this transaction. The assets owned by this entity totalled $18.2 billion as at October 31, 2022 ($16.0 billion as at October 31, 2021), of which $17.9 billion ($15.7 billion as at October 31, 2021) is presented in *Residential mortgage* loans on the Bank's Consolidated Balance Sheet.

Note 14 – Other Liabilities

As at October 31	2022	2021
Accounts payable and accrued expenses	2,582	2,469
Subsidiaries' debts to third parties	156	437
Interest and dividends payable	1,063	552
Lease liabilities	552	575
Due to clients, dealers and brokers	730	735
Defined benefit liability (Note 23)	111	143
Allowances for credit losses – Off-balance-sheet commitments (Note 7)	162	162
Deferred tax liabilities (Note 24)	14	10
Current tax liabilities	67	478
Insurance liabilities	10	11
Other items[(1)(2)(3)]	914	729
	6,361	6,301

(1) As at October 31, 2022, *Other items* included $11 million in litigation provisions ($12 million as at October 31, 2021).
(2) As at October 31, 2022, *Other items* included $33 million in provisions for onerous contracts ($33 million as at October 31, 2021).
(3) As at October 31, 2022, *Other items* included the financial liability resulting from put options written to non-controlling interests of Flinks for an amount of $33 million ($25 million as at October 31, 2021).

Note 15 – Subordinated Debt

The subordinated debt represents direct unsecured obligations, in the form of notes and debentures, to the Bank's debt holders. The rights of the Bank's note and debenture holders are subordinate to the claims of depositors and certain other creditors. Approval from OSFI is required before the Bank can redeem its subordinated notes and debentures in whole or in part.

On August 31, 2022, the Bank redeemed debentures denominated in a foreign currency and maturing on February 28, 2087 in an amount of US$7 million at their nominal value plus accrued interest.

On July 25, 2022, the Bank issued medium-term notes for an amount of $750 million, bearing interest at 5.426% and maturing on August 16, 2032. The interest on these notes will be payable semi-annually at 5.426% per annum until August 16, 2027 and, thereafter, at a floating rate equal to the Canadian Overnight Repo Rate (CORRA) compounded daily plus 2.32% and payable quarterly. With the prior approval of OSFI, the Bank may, at its option, redeem these notes as of August 16, 2027, in whole or in part, at their nominal value plus accrued and unpaid interest. Since the medium-term notes satisfy the non-viability contingent capital requirements, they qualify for the purposes of calculating regulatory capital under Basel III.

As at October 31			2022	2021
Maturity date	**Interest rate**	**Redemption date**		
February 2028[(1)]	3.183%[(2)]	February 1, 2023[(3)]	750	750
August 2032[(1)]	5.426%[(4)]	August 16, 2027[(3)]	750	–
February 2087	Variable	Redeemable at the Bank's option since February 28, 1993	–	9
			1,500	759
Fair value hedge adjustment[(5)]			2	10
Unamortized issuance costs[(6)]			(3)	(1)
Total			1,499	768

(1) These notes contain non-viability contingent capital (NVCC) provisions and qualify for the purposes of calculating regulatory capital under Basel III. In the case of a trigger event as defined by OSFI, each note will be automatically and immediately converted, on a full and permanent basis, without the consent of the holder, into a specified number of common shares of the Bank as determined using an automatic conversion formula with a multiplier of 1.5 and a conversion price based on the greater of: (i) a floor price of $5.00; (ii) the current market price of common shares, which represents the volume weighted average price of common shares for the ten trading days ending on the trading day preceding the date of the trigger event. If the common shares are not listed on an exchange when this price is being established, the price will be the fair value reasonably determined by the Bank's Board. The number of shares issued is determined by dividing the par value of the note (plus accrued and unpaid interest on such note) by the conversion price and then applying the multiplier.
(2) Bearing interest at a rate of 3.183%, payable semi-annually until February 1, 2023, and thereafter bearing interest at a floating rate equal to three-month CDOR plus 0.72%, payable quarterly.
(3) With the prior approval of OSFI, the Bank may, at its option, redeem these notes in whole or in part, at their nominal value plus accrued and unpaid interest.
(4) Bearing interest at a rate of 5.426%, payable semi-annually until August 16, 2027, and thereafter bearing interest at a floating rate equal to CORRA compounded daily plus 2.32%, payable quarterly.
(5) The fair value hedge adjustment represents the impact of the hedging transactions applied to hedge changes in the fair value of subordinated debt caused by interest rate fluctuations.
(6) The unamortized costs related to the issuance of the subordinated debt represent the initial cost, net of accumulated amortization, calculated using the effective interest rate method.

Note 16 – Derivative Financial Instruments

Derivative financial instruments are financial contracts whose value is derived from an underlying interest rate, exchange rate, equity price, commodity price, credit spread, or index.

The main types of derivative financial instruments used are presented below.

Forwards and Futures
Forwards and futures are contractual obligations to buy or sell a specified amount of currency, interest rate, commodity, or financial instrument on a specified future date at a specified price. Forwards are tailor-made agreements transacted in the over-the-counter market. Futures are traded on organized exchanges and are subject to cash margining calculated daily by clearing houses.

Swaps
Swaps are over-the-counter contracts in which two parties agree to exchange cash flows. The Bank uses the following types of swap contracts:

- Cross-currency swaps are transactions in which counterparties exchange fixed-rate interest payments and principal payments in different currencies.
- Interest rate swaps are transactions in which counterparties exchange fixed- and floating-rate interest payments based on the notional principal value in the same currency.
- Commodity swaps are transactions in which counterparties exchange fixed- and floating-rate payments based on the notional principal value of a commodity.
- Equity swaps are transactions in which counterparties agree to exchange the return on one equity or group of equities for a payment based on an interest rate benchmark.
- Credit default swaps are transactions in which one of the parties agrees to pay returns to the other party so that the latter can make a payment if a credit event occurs.

Options
Options are agreements between two parties in which the writer of the option grants the buyer the right, but not the obligation, to buy or sell, either at a specified date or dates or at any time prior to a predetermined expiry date, a specific amount of currency, commodity, or financial instrument at an agreed-upon price upon the sale of the option. The writer receives a premium for the sale of this instrument.

Notional Amounts[1]

As at October 31								2022	2021
					Term to maturity				
	3 months or less	Over 3 months to 12 months	Over 1 year to 5 years	Over 5 years	Total contracts	Contracts held for trading purposes	Contracts designated as hedges	Total contracts
Interest rate contracts								
OTC contracts								
Forward rate agreements								
Not settled by central counterparties	7,873	632	–	–	8,505	8,505	–	6,058
Settled by central counterparties	–	–	–	–	–	–	–	495
Swaps								
Not settled by central counterparties	4,665	10,513	56,972	49,234	121,384	119,504	1,880	119,380
Settled by central counterparties	314,872	168,685	316,246	121,854	921,657	868,393	53,264	690,197
Options purchased	150	513	3,961	1,295	5,919	5,824	95	4,833
Options written	652	1,804	5,167	1,387	9,010	8,116	894	6,471
	328,212	182,147	382,346	173,770	1,066,475	1,010,342	56,133	827,434
Exchange-traded contracts								
Futures								
Long positions	10,758	12,115	5,599	–	28,472	28,472	–	56,893
Short positions	42,455	15,160	4,590	–	62,205	62,205	–	49,631
Options purchased	3,000	–	–	–	3,000	3,000	–	15,974
Options written	1,362	–	–	–	1,362	1,362	–	8,882
	57,575	27,275	10,189	–	95,039	95,039	–	131,380
Foreign exchange contracts								
OTC contracts								
Forwards	58,344	14,829	8,412	587	82,172	82,172	–	78,401
Swaps	301,820	82,772	98,472	32,620	515,684	502,392	13,292	447,547
Options purchased	12,875	17,441	4,515	–	34,831	34,831	–	17,295
Options written	13,351	23,013	3,113	–	39,477	39,477	–	18,924
	386,390	138,055	114,512	33,207	672,164	658,872	13,292	562,167
Exchange-traded contracts								
Futures								
Long positions	72	–	–	–	72	72	–	54
Short positions	42	13	–	–	55	55	–	83
	114	13	–	–	127	127	–	137
Equity, commodity and credit derivative contracts[2]								
OTC contracts								
Forwards	–	3	3,471	261	3,735	3,735	–	4,288
Swaps								
Not settled by central counterparties	20,331	19,572	17,298	8,368	65,569	65,433	136	80,067
Settled by central counterparties	310	258	3,250	815	4,633	4,633	–	3,713
Options purchased	549	404	869	–	1,822	1,822	–	1,625
Options written	443	240	1,425	263	2,371	2,371	–	1,966
	21,633	20,477	26,313	9,707	78,130	77,994	136	91,659
Exchange-traded contracts								
Futures								
Long positions	3,650	697	403	39	4,789	4,789	–	7,173
Short positions	10,121	2,686	645	–	13,452	13,452	–	13,659
Options purchased	6,255	1,906	981	–	9,142	9,142	–	23,110
Options written	6,332	2,866	2,292	–	11,490	11,490	–	24,522
	26,358	8,155	4,321	39	38,873	38,873	–	68,464
	820,282	376,122	537,681	216,723	1,950,808	1,881,247	69,561	1,681,241

(1) Notional amounts are not presented in assets or liabilities on the Consolidated Balance Sheet. They represent the reference amount of the contract to which a rate or price is applied to determine the amount of cash flows to be exchanged.
(2) Includes precious metal contracts.

Note 16 – Derivative Financial Instruments (cont.)

Credit Risk

Credit risk on derivative financial instruments is the risk of financial loss that the Bank will have to assume if a counterparty fails to honour its contractual obligations. Credit risk related to derivative financial instruments is subject to the same credit approval, credit limit, and credit monitoring standards as those applied to the Bank's other credit transactions. Consequently, the Bank evaluates the creditworthiness of counterparties and manages the size of the portfolios as well as the diversification and maturity profiles of these financial instruments.

The Bank limits the credit risk of over-the-counter contracts by dealing with creditworthy counterparties and entering into contracts that provide for the exchange of collateral between parties where the fair value of the outstanding transactions exceeds an agreed threshold. The Bank also negotiates master netting agreements that provide for the simultaneous close-out and settling of all transactions with a given counterparty on a net basis in the event of default, insolvency, or bankruptcy. However, overall exposure to credit risk, reduced through master netting agreements, may change substantially after the balance sheet date because it is affected by all transactions subject to a contract as well as by changes in the market rates of the underlying instruments.

The Bank also uses financial intermediaries to have access to established clearing houses in order to minimize the settlement risk arising from financial derivative transactions. In some cases, the Bank has direct access to clearing houses for settling derivative financial instruments. In addition, certain derivative financial instruments traded over the counter are settled directly or indirectly by central counterparties.

In the case of exchange-traded contracts, exposure to credit risk is limited because these transactions are standardized contracts executed on established exchanges, each of which is associated with a well-capitalized clearing house that assumes the obligations of both counterparties and guarantees their performance obligations. All exchange-traded contracts are subject to initial margins and daily settlement.

Terms Used

Replacement Cost

Replacement cost is the Bank's maximum credit risk associated with derivative financial instruments as at the Consolidated Balance Sheet date. This amount is the positive fair value of all derivative financial instruments, before all master netting agreements and collateral held.

Credit Risk Equivalent

The credit risk equivalent amount is the total replacement cost plus an amount representing the potential future credit risk exposure, as outlined in OSFI's *Capital Adequacy Requirements Guideline*.

Risk-Weighted Amount

The risk-weighted amount is determined by applying the OSFI guidance to the credit risk equivalent.

Credit Risk Exposure of the Derivative Financial Instrument Portfolio

As at October 31			2022			2021
	Replacement cost	Credit risk equivalent[1]	Risk-weighted amount[1]	Replacement cost	Credit risk equivalent[1]	Risk-weighted amount[1]
Interest rate contracts	5,490	2,639	508	1,975	3,239	814
Foreign exchange contracts	8,775	5,926	1,847	6,453	4,361	1,405
Equity, commodity and credit derivative contracts	4,282	6,569	1,797	8,056	12,113	3,316
	18,547	15,134	4,152	16,484	19,713	5,535
Impact of master netting agreements	(9,583)			(9,398)		
	8,964	15,134	4,152	7,086	19,713	5,535

(1) The amounts are presented net of the Impact of master netting agreements.

Credit Risk Exposure of the Derivative Financial Instrument Portfolio by Counterparty

As at October 31		2022		2021
	Replacement cost	Credit risk equivalent	Replacement cost	Credit risk equivalent
OECD[1] member-country governments	1,342	2,700	771	2,604
Banks of OECD member countries	589	3,292	714	3,492
Other	7,033	9,142	5,601	13,617
	8,964	15,134	7,086	19,713

(1) Organisation for Economic Co-operation and Development.

Fair Value of Derivative Financial Instruments

As at October 31			2022			2021
	Positive	**Negative**	**Net**	Positive	Negative	Net
Contracts held for trading purposes						
Interest rate contracts						
Forwards	125	85	40	30	54	(24)
Swaps	3,267	3,620	(353)	909	1,316	(407)
Options	168	166	2	74	68	6
	3,560	3,871	(311)	1,013	1,438	(425)
Foreign exchange contracts						
Forwards	1,426	919	507	2,190	2,365	(175)
Swaps	6,461	7,140	(679)	4,026	3,601	425
Options	707	597	110	234	250	(16)
	8,594	8,656	(62)	6,450	6,216	234
Equity, commodity and credit derivative contracts						
Forwards	911	314	597	1,369	886	483
Swaps	1,926	3,717	(1,791)	2,375	5,198	(2,823)
Options	1,440	1,793	(353)	4,305	4,922	(617)
	4,277	5,824	(1,547)	8,049	11,006	(2,957)
Total – Contracts held for trading purposes	16,431	18,351	(1,920)	15,512	18,660	(3,148)
Contracts designated as hedges						
Interest rate contracts						
Swaps	1,930	1,137	793	962	268	694
Options	–	35	(35)	–	207	(207)
	1,930	1,172	758	962	475	487
Foreign exchange contracts						
Swaps	182	109	73	3	232	(229)
Options	–	–	–	–	–	–
	182	109	73	3	232	(229)
Equity, commodity and credit derivative contracts						
Swaps	4	–	4	7	–	7
Options	–	–	–	–	–	–
	4	–	4	7	–	7
Total – Contracts designated as hedges	2,116	1,281	835	972	707	265
Designated as fair value hedges	1,186	586	600	644	272	372
Designated as cash flow hedges	930	695	235	328	435	(107)
Designated as a hedge of a net investment in a foreign operation	–	–	–	–	–	–
Total fair value	18,547	19,632	(1,085)	16,484	19,367	(2,883)
Impact of master netting agreements	(9,583)	(9,583)	–	(9,398)	(9,398)	–
	8,964	10,049	(1,085)	7,086	9,969	(2,883)

Note 17 – Hedging Activities

The Bank's market risk exposure, risk management objectives, policies and procedures, and risk measurement methods are presented in the Risk Management section of the MD&A for the year ended October 31, 2022.

The Bank has elected, as permitted under IFRS 9, to continue applying the hedge accounting requirements of IAS 39. Some of the tables present information on currencies, specifically, the U.S. dollar (USD), the Australian dollar (AUD), the Canadian dollar (CAD), the Hong Kong dollar (HKD), the euro (EUR), and the pound sterling (GBP).

Note 17 – Hedging Activities (cont.)

The following table shows the notional amounts and the weighted average rates by term to maturity of the designated derivative instruments and their fair value by type of hedging relationship.

As at October 31							2022			2021
				Term to maturity			Fair value			Fair value
	1 year or less	Over 1 year to 2 years	Over 2 years to 5 years	Over 5 years	Total	Assets	Liabilities	Total	Assets	Liabilities
Fair value hedges										
Interest rate risk										
Interest rate swaps						1,176	527		642	63
Notional amount – LIBOR reform[1]	–	–	509	903	1,412			2,025		
Notional amount – CDOR reform[2]	–	815	8,246	1,669	10,730			–		
Notional amount – Other	1,053	1,860	5,770	1,464	10,147			16,572		
Average fixed interest rate – Pay fixed	1.6 %	1.0 %	1.7 %	2.2 %	1.7 %			1.2 %		
Average fixed interest rate – Receive fixed	0.9 %	3.3 %	1.1 %	2.7 %	2.0 %			2.0 %		
Cross-currency swaps						10	24		2	2
Notional amount – LIBOR reform[1]	–	–	–	32	32			22		
Notional amount – Other	120	–	–	40	160			110		
Average USD-AUD exchange rate	–	–	–	$ 0.7381	$ 0.7381			$ 0.7351		
Average CAD-HKD exchange rate	$ 0.1621	–	–	–	$ 0.1621			$ 0.1621		
Average USD-EUR exchange rate	–	–	–	$ 1.0513	$ 1.0513			–		
Options						–	35		–	207
Notional amount – LIBOR reform[1]	–	–	–	409	409			372		
Notional amount – CDOR reform[2]	–	–	–	30	30			–		
Notional amount – Other	52	–	74	424	550			541		
Average fixed interest rate – Purchased	(0.8) %	–	(1.3) %	–	(1.2) %			(0.8) %		
Average fixed interest rate – Written	2.9 %	–	–	2.8 %	2.8 %			2.8 %		
	1,225	2,675	14,599	4,971	23,470	1,186	586	19,642	644	272
Cash flow hedges										
Interest rate risk										
Interest rate swaps						754	610		320	205
Notional amount – CDOR reform[2]	–	526	8,414	3,460	12,400			–		
Notional amount – Other	13,702	2,909	2,790	1,054	20,455			31,223		
Average fixed interest rate – Pay fixed	1.8 %	1.9 %	1.7 %	2.6 %	1.9 %			1.6 %		
Average fixed interest rate – Receive fixed	2.1 %	0.7 %	1.5 %	2.2 %	1.9 %			0.6 %		
Cross-currency swaps						172	85		1	230
Notional amount – LIBOR reform[1]	2,014	1,010	2,020	673	5,717			13,324		
Notional amount – CDOR reform[2]	–	399	2,357	1,132	3,888			–		
Notional amount – Other	2,238	1,120	127	–	3,485			3,512		
Average CAD-USD exchange rate	$ 1.3179	$ 1.3069	$ 1.2749	$ 1.2907	$ 1.2972			$ 1.2945		
Average USD-EUR exchange rate	$ 1.1397	$ 1.1534	$ 1.1995	$ 1.1889	$ 1.1691			$ 1.1587		
Average USD-GBP exchange rate	–	–	$ 1.2375	–	$ 1.2375			–		
Equity price risk										
Equity swaps										
Notional amount – CDOR reform[2]	136	–	–	–	136	4	–	131	7	–
Average price	$ 86.36	–	–	–	$ 86.36			$ 97.54		
	18,090	5,964	15,708	6,319	46,081	930	695	48,190	328	435
Hedges of net investments in foreign operations[3]										
Foreign exchange risk										
Cross-currency swaps										
Notional amount	10	–	–	–	10	–	–	5	–	–
Average CAD-USD exchange rate	$ 1.3802	–	–	–	$ 1.3802			$ 1.2378		
Average USD-HKD exchange rate	$ 0.1275	–	–	–	$ 0.1275			–		
	10	–	–	–	10	–	–	5	–	–
	19,325	8,639	30,307	11,290	69,561	2,116	1,281	67,837	972	707

(1) Includes only contracts that reference USD LIBOR and that mature after June 30, 2023.
(2) Includes only contracts that reference CDOR and that mature after June 28, 2024.
(3) As at October 31, 2022, the Bank also designated $1,410 million in foreign currency deposits denominated in U.S. dollars as net investment hedging instruments ($1,313 million as at October 31, 2021).

Fair Value Hedges

Fair value hedge transactions consist of using derivative financial instruments (interest rate swaps and options) to hedge changes in the fair value of a financial asset or financial liability caused by interest rate fluctuations. Changes in the fair values of derivative financial instruments used as hedging instruments offset changes in the fair value of the hedged items. The Bank applies this strategy mainly to portfolios of securities measured at fair value through other comprehensive income, fixed-rate mortgage loans, fixed-rate deposits, liabilities related to transferred receivables, and subordinated debt.

In addition, when a fixed-rate asset or liability is denominated in a foreign currency, the Bank sometimes uses cross-currency swaps to hedge the associated foreign exchange risk. The Bank may designate a cross-currency swap to exchange the fixed-rate foreign currency for the functional currency at a floating rate in a single hedging relationship addressing both interest rate risk and foreign exchange risk. In certain cases, given that interest rate risk and foreign exchange risk are hedged in a single hedging relationship, the information below does not distinguish between interest rate risk and the combination of interest rate risk and foreign exchange risk as two separate risk categories. The Bank applies this strategy mainly to foreign currency fixed-rate deposits.

Regression analysis is used to test hedge effectiveness and determine the hedge ratio. For fair value hedges, the main source of potential hedge ineffectiveness is a circumstance where the critical terms of the hedging instrument and the hedged item are not closely aligned.

The following tables show amounts related to hedged items as well as the results of the fair value hedges.

	As at October 31, 2022			Year ended October 31, 2022		
	Carrying value of hedged items	**Cumulative hedge adjustments from active hedges**	**Cumulative adjustments from discontinued hedges**	**Gains (losses) on the hedged items for ineffectiveness measurement[1]**	**Gains (losses) on the hedging instruments for ineffectiveness measurement[1]**	**Hedge ineffectiveness[1]**
Securities at fair value through other comprehensive income	6,805	(529)	(53)	(588)	589	1
Mortgages	6,488	(332)	(231)	(415)	453	38
Deposits	5,803	(595)	9	682	(677)	5
Liabilities related to transferred receivables	682	(3)	68	3	(3)	–
Subordinated debt	2	–	2	–	–	–
				(318)	362	44

	As at October 31, 2021			Year ended October 31, 2021		
	Carrying value of hedged items	Cumulative hedge adjustments from active hedges	Cumulative adjustments from discontinued hedges	Gains (losses) on the hedged items for ineffectiveness measurement[1]	Gains (losses) on the hedging instruments for ineffectiveness measurement[1]	Hedge ineffectiveness[1]
Securities at fair value through other comprehensive income	7,471	(183)	27	(309)	310	1
Mortgages	7,609	(192)	(17)	(222)	234	12
Deposits	3,190	42	70	121	(123)	(2)
Liabilities related to transferred receivables	105	–	105	23	(23)	–
Subordinated debt	10	–	10	–	–	–
				(387)	398	11

(1) Amounts are presented on a pre-tax basis.

Note 17 – Hedging Activities (cont.)

Cash Flow Hedges

Cash flow hedge transactions consist of using interest rate swaps to hedge the risk of changes in future cash flows caused by floating-rate assets or liabilities. In addition, the Bank sometimes uses cross-currency swaps to hedge the foreign exchange risk caused by assets or liabilities denominated in foreign currencies. In certain cases, given that interest rate risk and foreign exchange risk are hedged in a single hedging relationship, the information below does not distinguish between interest rate risk and the combination of interest rate risk and foreign exchange risk as two separate risk categories. The Bank applies this strategy mainly to its loan, personal credit line, acceptance, and deposit portfolios as well as liabilities related to transferred receivables.

The Bank also uses total return swaps to hedge the risk of changes in future cash flows related to the Restricted Stock Unit (RSU) Plan. Some of these swaps are designated as part of a cash flow hedge against a portion of the unrecognized obligation of the RSU Plan. In cash flow hedges, the derivative financial instruments used as hedging instruments reduce the variability of the future cash flows related to the hedged items.

Regression analysis is used to assess hedge effectiveness and to determine the hedge ratio. For cash flow hedges, the main source of potential hedge ineffectiveness is a circumstance where the critical terms of the hedging instrument and the hedged item are not closely aligned.

The following tables show the amounts related to hedged items as well as the results of the cash flow hedges.

	As at October 31, 2022		Year ended October 31, 2022				
	Accumulated other comprehensive income from active hedges	*Accumulated other comprehensive income* from discontinued hedges	Gains (losses) on hedged items for ineffectiveness measurement[1]	Gains (losses) on hedging instruments for ineffectiveness measurement[1]	Hedge ineffectiveness[1]	Unrealized gains (losses) included in *Other comprehensive income* as the effective portion of the hedging instrument[1]	Losses (gains) reclassified to *Net interest income*[1]
Interest rate risk							
Loans	(169)	(241)	357	(356)	–	(356)	33
Deposits	28	10	257	(253)	–	62	–
Acceptances	210	115	(253)	255	2	253	23
Liabilities related to transferred receivables	64	27	(54)	55	1	54	(11)
	133	(89)	307	(299)	3	13	45
Equity price risk							
Other liabilities	–	–	47	(47)	–	(47)	–
	133	(89)	354	(346)	3	(34)	45

	As at October 31, 2021		Year ended October 31, 2021				
	Accumulated other comprehensive income from active hedges	*Accumulated other comprehensive income* from discontinued hedges	Gains (losses) on hedged items for ineffectiveness measurement[1]	Gains (losses) on hedging instruments for ineffectiveness measurement[1]	Hedge ineffectiveness[1]	Unrealized gains (losses) included in *Other comprehensive income* as the effective portion of the hedging instrument[1]	Losses (gains) reclassified to *Net interest income*[1]
Interest rate risk							
Loans	(76)	(10)	87	(85)	–	(84)	(2)
Deposits	(15)	(8)	488	(487)	–	163	(5)
Acceptances	161	(113)	(208)	214	6	208	46
Liabilities related to transferred receivables	48	–	(54)	56	2	54	–
	118	(131)	313	(302)	8	341	39
Equity price risk							
Other liabilities	47	–	(35)	35	–	39	(4)
	165	(131)	278	(267)	8	380	35

(1) Amounts are presented on a pre-tax basis.

Hedges of Net Investments in Foreign Operations

The Bank's structural foreign exchange risk arises from investments in foreign operations denominated in currencies other than the Canadian dollar. The Bank measures this risk by assessing the impact of foreign currency fluctuations and hedges it using derivative and non-derivative financial instruments (cross-currency swaps and deposits). In a hedge of a net investment in a foreign operation (net investment hedge), the financial instruments used offset the foreign exchange gains and losses on the investments. When non-derivative financial instruments are designated as foreign exchange risk hedges, only the changes in fair value that are attributable to foreign exchange risk are taken into account when assessing and calculating the effectiveness of the hedge.

Assessing the effectiveness of net investment hedges consists of comparing changes in the carrying value of the deposits or the fair value of the derivative attributable to exchange rate fluctuations with changes in the net investment in a foreign operation attributable to exchange rate fluctuations. Inasmuch as the notional amount of the hedging instruments and the hedged net investments are aligned, no ineffectiveness is expected.

The following tables present the amounts related to hedged items as well as the results of the net investment hedges.

	As at October 31, 2022		Year ended October 31, 2022				
	***Accumulated other comprehensive income* from active hedges**	***Accumulated other comprehensive income* from discontinued hedges**	**Gains (losses) on hedged items for ineffectiveness measurement[1]**	**Gains (losses) on hedging instruments for ineffectiveness measurement[1]**	**Hedge ineffectiveness[1]**	**Unrealized gains (losses) included in *Other comprehensive income* as the effective portion of the hedging instrument[1]**	**Losses (gains) reclassified to the *Non-interest income* item[1]**
Net investments in foreign operations denominated in:							
USD	**26**	**(276)**	**166**	**(166)**	**–**	**(166)**	**–**

	As at October 31, 2021		Year ended October 31, 2021				
	Accumulated other comprehensive income from active hedges	*Accumulated other comprehensive income* from discontinued hedges	Gains (losses) on hedged items for ineffectiveness measurement[1]	Gains (losses) on hedging instruments for ineffectiveness measurement[1]	Hedge ineffectiveness[1]	Unrealized gains (losses) included in *Other comprehensive income* as the effective portion of the hedging instrument[1]	Losses (gains) reclassified to the *Non-interest income* item[1]
Net investments in foreign operations denominated in:							
USD	35	(120)	(119)	119	–	119	–

(1) Amounts are presented on a pre-tax basis.

Note 17 – Hedging Activities (cont.)

Reconciliation of Equity Components

The following table presents a reconciliation by risk category of *Accumulated other comprehensive income* attributable to hedge accounting.

As at October 31		2022		2021
	Net gains (losses) on cash flow hedges	**Net foreign currency translation adjustments**	Net gains (losses) on cash flow hedges	Net foreign currency translation adjustments
Balance at beginning	**23**	**(129)**	(283)	61
Hedges of net investments in foreign operations[1]				
Gains (losses) included as the effective portion		**(166)**		119
Losses (gains) reclassified to *Non-interest income*		**–**		–
Net foreign currency translation gains (losses) on investments in foreign operations		**458**		(286)
Cash flow hedges[1]				
Gains (losses) included as the effective portion				
Interest rate risk	**13**		341	
Equity price risk	**(47)**		39	
Losses (gains) reclassified to *Net interest income*				
Interest rate risk	**45**		39	
Equity price risk	**–**		(4)	
Other comprehensive income attributable to non-controlling interests	**–**	**–**	–	13
Income taxes	**(3)**	**41**	(109)	(36)
Balance at end	**31**	**204**	23	(129)

(1) Amounts are presented on a pre-tax basis.

Note 18 – Share Capital and Other Equity Instruments

Authorized

Common Shares

An unlimited number of shares without par value.

First Preferred Shares

An unlimited number of shares, without par value, issuable for a maximum aggregate consideration of $5 billion.

First Preferred Shares and Other Equity Instruments

As at October 31, 2022

	Redemption and conversion date[1][2]	Redemption price per share or LRCN ($)[1]	Convertible into preferred shares[2]	Dividend per share ($) or interest rate per LRCN[3]	Reset premium of the dividend rate or interest rate
First preferred shares issued and outstanding					
Series 30[4]	May 15, 2024 [5][6]	25.00	Series 31	0.25156 [7]	2.40 %
Series 32[4]	February 15, 2025 [5][6]	25.00	Series 33	0.23994 [7]	2.25 %
Series 38[4]	November 15, 2022 [5][6]	25.00	Series 39	0.27813 [8]	3.43 %
Series 40[4]	May 15, 2023 [5][6]	25.00	Series 41	0.28750 [8]	2.58 %
Series 42[4]	November 15, 2023 [5][6]	25.00	Series 43	0.30938 [8]	2.77 %
Other equity instruments issued and outstanding					
Limited Recourse Capital Notes (LRCN)					
Series 1 (LRCN – Series 1)[9][10]	October 15, 2025 [5]	1,000.00	Series 44 [9]	4.30 %[11]	3.943 %
Series 2 (LRCN – Series 2)[9][10]	July 15, 2026 [5]	1,000.00	Series 45 [9]	4.05 %[11]	3.045 %
Series 3 (LRCN – Series 3)[9][10]	October 16, 2027 [5]	1,000.00	Series 46 [9]	7.50 %[11]	4.281 %
First preferred shares authorized but not issued					
Series 31[4]	May 15, 2024 [5]	25.00 [12]	n.a.	Floating rate [13]	2.40 %
Series 33[4]	February 15, 2025 [5]	25.00 [12]	n.a.	Floating rate [13]	2.25 %
Series 39[4]	November 15, 2022 [5]	25.50 [14]	n.a.	Floating rate [13]	3.43 %
Series 41[4]	May 15, 2023 [5]	25.50 [14]	n.a.	Floating rate [13]	2.58 %
Series 43[4]	November 15, 2023 [5]	25.50 [14]	n.a.	Floating rate [13]	2.77 %

n.a. Not applicable

(1) Redeemable in cash at the Bank's option, in whole or in part, subject to the provisions of the *Bank Act* (Canada) and to OSFI approval. For the preferred shares, the redemption prices are increased by all the declared and unpaid dividends on the preferred shares to the date fixed for redemption. In the case of LRCN, the redemption prices are increased by interest accrued and unpaid up to the redemption date.

(2) Convertible at the option of the holders of first preferred shares issued and outstanding, subject to certain conditions.

(3) The dividends are non-cumulative and payable quarterly, whereas interest on the LRCN is payable semi-annually.

(4) Upon the occurrence of a trigger event, as defined by OSFI, each outstanding preferred share will be automatically and immediately converted, on a full and permanent basis, without the consent of the holder, into a number of Bank common shares determined pursuant to an automatic conversion formula. This conversion will be calculated by dividing the value of the preferred shares, i.e., $25.00 per share, plus all declared and unpaid dividends as at the date of the trigger event, by the value of the common shares. The value of the common shares will be the greater of a $5.00 floor price or the current market price of the common shares. Current market price means the volume weighted average trading price of common shares for the ten consecutive trading days ending on the trading day preceding the date of the trigger event. If the common shares are not listed on an exchange when this price is being established, the price will be the fair value reasonably determined by the Bank's Board.

(5) For the preferred shares, redeemable at the date fixed for redemption and on the same date every five years thereafter. In the case of LRCN, the redemption occurs automatically upon the redemption of the preferred shares issued by the Bank in conjunction with the LRCN and held in a limited recourse trust. The preferred shares issued and held in a limited recourse trust are redeemable for a period of one month from the date fixed for redemption and on the same dates every five years thereafter.

(6) Convertible on the date fixed for conversion and on the same date every five years thereafter, subject to certain conditions.

(7) The dividend amount is set for the five-year period commencing on May 16, 2019 for Series 30 and on February 16, 2020 for Series 32 and ending on the redemption date. Thereafter, these shares carry a non-cumulative quarterly fixed dividend in an amount per share determined by multiplying the rate of interest equal to the sum of the five-year Government of Canada bond yield on the applicable fixed-rate calculation date by $25.00, plus the reset premium.

(8) The dividend amount is set for the initial period ending on the date fixed for redemption. Thereafter, these shares carry a non-cumulative quarterly fixed dividend in an amount per share determined by multiplying the rate of interest equal to the sum of the five-year Government of Canada bond yield on the applicable fixed-rate calculation date by $25.00, plus the reset premium.

Note 18 – Share Capital and Other Equity Instruments (cont.)

(9) The LRCN – Series 1, LRCN – Series 2 and LRCN – Series 3 are notes for which recourse is limited to the assets held by an independent trustee in a consolidated limited recourse trust. The trust assets consist of Series 44, Series 45 and Series 46 preferred shares issued by the Bank in conjunction with the LRCN – Series 1, LRCN – Series 2 and LRCN – Series 3. In the event of (i) non-payment of interest on any of the interest payment dates, (ii) non-payment of the redemption amount upon redemption of the LRCN, (iii) non-payment of the principal amount upon maturity of the LRCN, or (iv) an event of default in respect of the LRCN, the noteholders will have recourse only to the assets of the trust, and each noteholder will be entitled to its pro rata share of the assets of the trust. In such circumstances, delivery of the assets of the trust will eliminate all of the Bank's obligations with respect to the LRCN. The LRCN – Series 1, LRCN – Series 2 and LRCN – Series 3 are redeemable at maturity or earlier to the extent that the Bank redeems the Series 44, Series 45 and Series 46 preferred shares from the date fixed for redemption, and subject to OSFI's consent and approval.

(10) The Series 44, Series 45 and Series 46 preferred shares issued by the Bank in conjunction with the LRCN – Series 1, LRCN – Series 2 and LRCN – Series 3 are held by a consolidated limited recourse trust on the Bank's balance sheet and are therefore eliminated for financial reporting purposes. Upon the occurrence of a trigger event, as defined by OSFI; (i) each LRCN will be automatically redeemed and the redemption price will be covered by delivery of the trust's assets that consist of Series 44, Series 45 and Series 46 preferred shares; (ii) each outstanding preferred share will be automatically and immediately converted on a full and permanent basis, without the consent of the holder, into a number of Bank common shares determined pursuant to an automatic conversion formula. This conversion will be calculated by dividing the value of the preferred shares, i.e., $1,000 per share, plus all accrued and unpaid interest as at the date of the trigger event, by the value of the common shares. The value of the common shares will be the greater of a $5.00 floor price or the current market price of the common shares. Current market price means the volume weighted average trading price of common shares for the ten consecutive trading days ending on the trading day preceding the date of the trigger event. If the common shares are not listed on an exchange when this price is being established, the price will be the fair value reasonably determined by the Bank's Board.

(11) The interest rate is set for the initial period ending on the date fixed for redemption. Every five years thereafter until November 15, 2075 for the LRCN – Series 1, until August 15, 2076 for the LRCN – Series 2 and until November 16, 2077 for the LRCN – Series 3, the interest rate on the notes will be adjusted and will be an annual interest rate equal to the five-year Government of Canada bond yield on the applicable interest rate calculation date, plus the interest rate reset premium.

(12) As of the date fixed for redemption, and every five years thereafter, the redemption price will be $25.00 per share.

(13) The dividend period begins as of the date fixed for redemption. The amount of the floating quarterly non-cumulative dividend is determined by multiplying by $25.00 the rate of interest equal to the sum of the 90-day Government of Canada treasury bill yield on the floating rate calculation date, plus the reset premium.

(14) As of the date fixed for redemption, the redemption price will be $25.50 per share. Thereafter, on the same date every five years, the redemption price will be $25.00 per share.

Second Preferred Shares

15 million shares without par value, issuable for a maximum aggregate consideration of $300 million. As at October 31, 2022, no shares had been issued or traded.

Shares and Other Equity Instruments Outstanding

As at October 31	2022		2021	
	Number of shares or LRCN	Shares or LRCN $	Number of shares or LRCN	Shares or LRCN $
First Preferred Shares				
Series 30	14,000,000	350	14,000,000	350
Series 32	12,000,000	300	12,000,000	300
Series 38	16,000,000	400	16,000,000	400
Series 40	12,000,000	300	12,000,000	300
Series 42	12,000,000	300	12,000,000	300
	66,000,000	1,650	66,000,000	1,650
Other equity instruments				
LRCN – Series 1	500,000	500	500,000	500
LRCN – Series 2	500,000	500	500,000	500
LRCN – Series 3	500,000	500	–	–
	1,500,000	1,500	1,000,000	1,000
Preferred shares and other equity instruments	67,500,000	3,150	67,000,000	2,650
Common shares at beginning of year	337,912,283	3,160	335,997,660	3,057
Issued pursuant to the Stock Option Plan	1,193,663	61	1,930,033	104
Repurchase of common shares for cancellation	(2,500,000)	(24)	–	–
Impact of shares purchased or sold for trading(1)	(18,295)	(1)	(14,432)	(1)
Other	(5,527)	–	(978)	–
Common shares at end of year	336,582,124	3,196	337,912,283	3,160

(1) As at October 31, 2022, a total of 5,250 shares were sold short for trading, representing a negligible amount (as at October 31, 2021, a total of 13,045 shares were sold short for trading, representing $1 million).

Dividends Declared and Distributions on Other Equity Instruments

Year ended October 31		2022		2021
	Dividends or interest $	Dividends per share	Dividends or interest $	Dividends per share
First Preferred Shares				
Series 30	14	1.0063	14	1.0063
Series 32	12	0.9598	12	0.9598
Series 34	–	–	11	0.7000
Series 36	–	–	16	1.0125
Series 38	18	1.1125	18	1.1125
Series 40	14	1.1500	14	1.1500
Series 42	14	1.2375	14	1.2375
	72		99	
Other equity instruments				
LRCN – Series 1[(1)]	21		21	
LRCN – Series 2[(2)]	20		11	
LRCN – Series 3[(3)]	6		–	
	47		32	
Preferred shares and other equity instruments	119		131	
Common shares	1,206	3.5800	958	2.8400
	1,325		1,089	

(1) The LRCN – Series 1 bear interest at a fixed rate of 4.30% per annum.
(2) The LRCN – Series 2 bear interest at a fixed rate of 4.05% per annum.
(3) The LRCN – Series 3 bear interest at a fixed rate of 7.50% per annum.

Issuances of Other Equity Instruments

On September 8, 2022, the Bank issued $500 million of LRCN – Series 3 for which recourse of the noteholders is limited to the assets held by an independent trustee in a consolidated limited recourse trust. The trust's assets consist of $500 million of Series 46 first preferred shares issued by the Bank in conjunction with the LRCN – Series 3. The LRCN – Series 3 sell for $1,000 each and bear interest at a fixed rate of 7.50% per annum until November 16, 2027 exclusively and, thereafter, at an annual rate equal to the five-year Government of Canada bond yield plus 4.281% until November 16, 2077. The LRCN – Series 3 mature on November 16, 2082.

On April 21, 2021, the Bank had issued $500 million of LRCN – Series 2 for which recourse of the noteholders is limited to the assets held by an independent trustee in a consolidated limited recourse trust. The trust's assets consist of $500 million of Series 45 first preferred shares issued by the Bank in conjunction with the LRCN – Series 2. The LRCN – Series 2 sell for $1,000 each and bear interest at a fixed rate of 4.05% per annum until August 15, 2026 exclusively and, thereafter, at an annual rate equal to the five-year Government of Canada bond yield plus 3.045% until August 15, 2076. The LRCN – Series 2 mature on August 15, 2081.

In the event of (i) non-payment of interest on any of the interest payment dates, (ii) non-payment of the redemption amount upon redemption of the LRCN, (iii) non-payment of the principal amount upon maturity of the LRCN, or (iv) an event of default in respect of the notes, the noteholders will have recourse only to the assets of the trust, and each noteholder will be entitled to its pro rata share of the assets of the trust. In such circumstances, delivery of the trust's assets will eliminate all of the Bank's obligations with respect to the LRCN. The LRCN – Series 2 and LRCN – Series 3 are redeemable at maturity or earlier to the extent that the Bank redeems the Series 45 and Series 46 preferred shares on certain redemption dates specified in the terms and conditions of said preferred shares, and subject to OSFI's consent and approval.

Given that the LRCN – Series 2 and LRCN – Series 3 satisfy the non-viability contingent capital requirements, they qualify for the purposes of calculating regulatory capital under Basel III.

Redemptions of Preferred Shares

On August 16, 2021, i.e., the first business day after the August 15, 2021 redemption date, the Bank redeemed all the issued and outstanding Non-Cumulative 5-Year Rate-Reset Series 36 First Preferred Shares. Pursuant to the share conditions, the redemption price was $25.00 per share plus the periodic dividend declared and unpaid. The Bank redeemed 16,000,000 Series 36 preferred shares for a total amount of $400 million, which reduced *Preferred share* capital.

On May 17, 2021, i.e., the first business day after the May 15, 2021 redemption date, the Bank redeemed all the issued and outstanding Non-Cumulative 5-Year Rate-Reset Series 34 First Preferred Shares. Pursuant to the share conditions, the redemption price was $25.00 per share plus the periodic dividend declared and unpaid. The Bank redeemed 16,000,000 Series 34 preferred shares for a total amount of $400 million, which reduced *Preferred share* capital.

Note 18 – Share Capital and Other Equity Instruments (cont.)

Repurchases of Common Shares
On December 10, 2021, the Bank began a normal course issuer bid to repurchase for cancellation up to 7,000,000 common shares (representing approximately 2% of its outstanding common shares) over the 12-month period ending no later than December 9, 2022. Any repurchase through the Toronto Stock Exchange will be done at market price. The common shares may also be repurchased through other means authorized by the Toronto Stock Exchange and applicable regulations, including private agreements or share repurchase programs under issuer bid exemption orders issued by the securities regulators. A private purchase made under an exemption order issued by a securities regulator will be done at a discount to the prevailing market price. The amounts that are paid above the average book value of the common shares are charged to *Retained earnings*. During the year ended October 31, 2022, the Bank repurchased 2,500,000 common shares for $245 million, which reduced *Common share* capital by $24 million and *Retained earnings* by $221 million.

Reserved Common Shares
As at October 31, 2022 and 2021, there were 15,507,568 common shares reserved under the Dividend Reinvestment and Share Purchase Plan. As at October 31, 2022, there were 21,742,009 common shares (22,935,672 as at October 31, 2021) reserved under the Stock Option Plan.

Restriction on the Payment of Dividends
The Bank is prohibited from declaring dividends on its common or preferred shares if there are reasonable grounds for believing that the Bank would, by so doing, be in contravention of the regulations of the *Bank Act* (Canada) or OSFI's capital adequacy and liquidity guidelines. In addition, the ability to pay common share dividends is restricted by the terms of the outstanding preferred shares pursuant to which the Bank may not pay dividends on its common shares without the approval of the holders of the outstanding preferred shares, unless all preferred share dividends have been declared and paid or set aside for payment.

Dividend Reinvestment and Share Purchase Plan
The Bank has a Dividend Reinvestment and Share Purchase Plan for holders of its common and preferred shares under which they can acquire common shares of the Bank without paying commissions or administration fees. Participants acquire common shares through the reinvestment of cash dividends paid on the shares they hold or through optional cash payments of at least $1 per payment, up to a maximum of $5,000 per quarter. Common shares subscribed by participants are purchased on their behalf in the secondary market through the Bank's transfer agent, Computershare Trust Company of Canada, at a price equal to the average purchase price of the common shares during the three business days immediately following the dividend payment date.

Note 19 – Non-Controlling Interests

As at October 31	**2022**	2021
Flinks Technology Inc.[1]	**2**	3

(1) As at October 31, 2022, the non-controlling interest in Flinks stood at 14.1% (14.1% as at October 31, 2021). For additional information, see Note 31 to these consolidated financial statements.

Note 20 – Capital Disclosure

Capital Management Objectives, Policies and Procedures
Capital management has a dual role of ensuring a competitive return to the Bank's shareholders while maintaining a solid capital foundation that covers the risks inherent to the Bank's business, supports its business segments, and protects its clients.

The Bank's capital management policy defines the guiding principles as well as the roles and responsibilities regarding its internal capital adequacy assessment process. This process is a key tool in establishing the Bank's capital strategy and is subject to quarterly reviews and periodic amendments.

Capital Management
Capital ratios are obtained by dividing capital (as defined by OSFI's *Capital Adequacy Requirements Guideline*) by risk-weighted assets and are expressed as percentages. Risk-weighted assets are calculated in accordance with the rules established by OSFI for on- and off-balance-sheet risks. Credit, market, and operational risks are factored into the risk-weighted assets calculation for regulatory purposes. The definition adopted by the Basel Committee on Banking Supervision (BCBS) distinguishes between three types of capital. Common Equity Tier 1 (CET1) capital consists of common shareholders' equity less goodwill, intangible assets, and other CET1 capital deductions. Additional Tier 1 (AT1) capital consists of eligible non-cumulative preferred shares, limited recourse capital notes, and other AT1 capital adjustments. The sum of CET1 and AT1 capital forms what is known as Tier 1 capital. Tier 2 capital consists of the eligible portion of subordinated debt and certain allowances for credit losses. Total regulatory capital is the sum of Tier 1 and Tier 2 capital.

The Bank and all other major Canadian banks have to maintain the following minimum capital ratios established by OSFI: a CET1 capital ratio of at least 10.5%, a Tier 1 capital ratio of at least 12.0%, and a Total capital ratio of at least 14.0%. All of these ratios include a capital conservation buffer of 2.5% established by the BCBS and OSFI as well as a 1.0% surcharge applicable solely to Domestic Systemically Important Banks (D-SIBs) and a 2.5% domestic stability buffer. The domestic stability buffer, which can vary from 0% to 2.5% of risk-weighted assets, consists exclusively of CET1 capital. A D-SIB that fails to meet this buffer requirement will not be subject to automatic constraints to reduce capital distributions but will have to provide a remediation plan to OSFI. On June 22, 2022, OSFI confirmed that the domestic stability buffer was being maintained at 2.5%. Banks also have to meet the capital floor that sets the regulatory capital level according to the Basel II Standardized Approach. If the capital requirement under Basel III is less than 70% of the capital requirements as calculated under Basel II, the difference is added to risk-weighted assets. Lastly, OSFI requires Canadian banks to meet a Basel III leverage ratio of at least 3.0%. The leverage ratio is a measure independent of risk that is calculated by dividing the amount of Tier 1 capital by total exposure. Total exposure is defined as the sum of on-balance-sheet assets (including derivative exposures and securities financing transaction exposures) and off-balance-sheet items. The assets deducted from Tier 1 capital are also deducted from total exposure.

Since November 1, 2021, OSFI has also been requiring D-SIBs to maintain a risk-based total loss-absorbing capacity (TLAC) ratio of at least 24.0% (including the domestic stability buffer) of risk-weighted assets and a TLAC leverage ratio of at least 6.75%. The purpose of TLAC is to ensure that a D-SIB has sufficient loss-absorbing capacity to support its recapitalization in the unlikely event it becomes non-viable.

During the years ended October 31, 2022 and 2021, the Bank was in compliance with all of OSFI's regulatory capital, leverage, and TLAC requirements.

Note 20 – Capital Disclosure (cont.)

Regulatory Capital[1], Leverage Ratio[1] and TLAC[2]

As at October 31	2022		2021	
	Adjusted[3]		Adjusted[3]	
Capital				
CET1	**14,763**	**14,818**	12,866	12,973
Tier 1	**17,906**	**17,961**	15,515	15,622
Total	**19,727**	**19,727**	16,643	16,643
Risk-weighted assets	**116,840**	**116,840**	104,358	104,358
Total exposure	**401,780**	**401,780**	351,160	351,160
Capital ratios				
CET1	**12.6 %**	**12.7 %**	12.3 %	12.4 %
Tier 1	**15.3 %**	**15.4 %**	14.9 %	15.0 %
Total	**16.9 %**	**16.9 %**	15.9 %	15.9 %
Leverage ratio	**4.5 %**	**4.5 %**	4.4 %	4.4 %
Available TLAC[2]	**32,351**	**32,351**	27,492	27,492
TLAC ratio[2]	**27.7 %**	**27.7 %**	26.3 %	26.3 %
TLAC leverage ratio[2]	**8.1 %**	**8.1 %**	7.8 %	7.8 %

(1) Capital, risk-weighted assets, total exposure, the capital ratios, and the leverage ratio are calculated in accordance with the Basel III rules, as set out in OSFI's *Capital Adequacy Requirements Guideline* and *Leverage Requirements Guideline*.
(2) Available TLAC, the TLAC ratio, and the TLAC leverage ratio are calculated in accordance with OSFI's *Total Loss Absorbing Capacity Guideline*.
(3) Adjusted amounts are calculated in accordance with the Basel III rules, as set out in OSFI's *Capital Adequacy Requirements Guideline*, and exclude the transitional measure for provisioning expected credit losses. For additional information, see the section entitled COVID-19 Relief Measures Still in Effect as at October 31, 2022 on page 58 of the MD&A.

Note 21 – Trading Activity Revenues

Trading activity revenues consist of the net interest income and the non-interest income related to trading activities.

Net interest income comprises dividends related to financial assets and liabilities associated with trading activities, net of interest expenses and interest income related to the financing of these financial assets and liabilities.

Non-interest income consists of realized and unrealized gains and losses as well as interest income on securities measured at fair value through profit or loss, income from held-for-trading derivative financial instruments, changes in the fair value of loans at fair value through profit or loss, changes in the fair value of financial instruments designated at fair value through profit or loss, certain commission income as well as other income related to trading activities, and any applicable transaction costs.

Year ended October 31	2022	2021
Net interest income	**682**	777
Non-interest income		
Trading revenues (losses)	**543**	268
Other revenues	**5**	14
	548	282
	1,230	1,059

Note 22 – Share-Based Payments

The compensation expense information provided below excludes the impact of hedging.

Stock Option Plan

The Bank's Stock Option Plan is for officers and other designated persons of the Bank and its subsidiaries. Under this plan, options are awarded annually and provide participants with the right to purchase common shares at an exercise price equal to the closing price of the Bank's common share on the Toronto Stock Exchange on the day preceding the award. The options vest evenly over a four-year period and expire ten years from the award date or, in certain circumstances set out in the plan, within specified time limits. The Stock Option Plan contains provisions for retiring employees that allow the participant's rights to continue vesting in accordance with the stated terms of the award agreement. The maximum number of common shares that may be issued under the Stock Option Plan was 21,742,009 as at October 31, 2022 (22,935,672 as at October 31, 2021). The number of common shares reserved for a participant may not exceed 5% of the total number of Bank shares issued and outstanding.

As at October 31	2022		2021	
	Number of options	Weighted average exercise price	Number of options	Weighted average exercise price
Stock Option Plan				
Outstanding at beginning	11,348,680	$ 57.93	11,425,403	$ 53.96
Awarded	1,771,588	$ 96.35	2,043,196	$ 71.55
Exercised	(1,193,663)	$ 45.73	(1,930,033)	$ 47.96
Cancelled[1]	(64,856)	$ 76.10	(189,886)	$ 67.02
Outstanding at end	11,861,749	$ 64.80	11,348,680	$ 57.93
Exercisable at end	7,344,536	$ 55.50	6,737,850	$ 50.81

(1) Includes 27,714 expired options during the year ended October 31, 2022 (35,342 expired options during the year ended October 31, 2021).

Exercise price	Options outstanding	Options exercisable	Expiry date
$38.36	470,324	470,324	December 2022
$44.96	697,207	697,207	December 2023
$47.93	963,282	963,282	December 2024
$42.17	790,312	790,312	December 2025
$54.69	868,437	868,437	December 2026
$64.14	1,240,493	1,240,493	December 2027
$58.79	1,577,166	1,108,204	December 2028
$71.86	1,566,934	746,474	December 2029
$71.55	1,933,226	459,803	December 2030
$96.35	1,754,368	–	December 2031
	11,861,749	7,344,536	

During the year ended October 31, 2022, the Bank awarded 1,771,588 stock options (2,043,196 stock options during the year ended October 31, 2021) with an average fair value of $13.24 per option ($8.24 for the year ended October 31, 2021).

The average fair value of options awarded was estimated on the award date using the Black-Scholes model as well as the following assumptions.

Year ended October 31	2022	2021
Risk-free interest rate	1.79%	1.02%
Expected life of options	7 years	7 years
Expected volatility	22.68%	22.59%
Expected dividend yield	3.88%	4.24%

Note 22 – Share-Based Payments (cont.)

The expected life of the options is based on historical data and is not necessarily representative of how the options will be exercised in the future. Expected volatility is extrapolated from the implied volatility of the Bank's share price and observable market inputs, which are not necessarily representative of actual results. The expected dividend yield represents the annualized dividend divided by the Bank's share price at the award date. The risk-free interest rate is based on the Canadian dollar swap curve at the award date. The exercise price is equal to the Bank's share price at the award date. No other market parameter has been included in the fair value measurement of the options.

For the year ended October 31, 2022, a $17 million compensation expense related to this plan was recognized in the Consolidated Statement of Income ($11 million for the year ended October 31, 2021).

Stock Appreciation Rights (SAR) Plan

The SAR Plan is for officers and other designated persons of the Bank and its subsidiaries. Under this plan, participants receive, upon exercising the right, a cash amount equal to the difference between the closing price of the Bank's common share on the Toronto Stock Exchange on the day preceding the exercise date and the closing price on the day preceding the award date. SARs vest evenly over a four-year period and expire ten years after the award date or, in certain circumstances set out in the plan, within specified time limits. The SAR Plan contains provisions for retiring employees that allow the participant's rights to continue vesting in accordance with the stated terms of the award agreement. For the year ended October 31, 2022, a compensation expense in a negligible amount related to this plan was recognized in the Consolidated Statement of Income ($7 million for the year ended October 31, 2021).

As at October 31	2022		2021	
	Number of SARs	**Weighted average exercise price**	Number of SARs	Weighted average exercise price
SAR Plan[1]				
Outstanding at beginning	**266,075**	**$ 57.61**	292,896	$ 53.66
Awarded	**21,464**	**$ 96.35**	30,504	$ 71.55
Exercised	**(79,698)**	**$ 59.89**	(57,325)	$ 44.88
Outstanding at end	**207,841**	**$ 60.73**	266,075	$ 57.61
Exercisable at end	**130,319**	**$ 51.31**	164,225	$ 51.43

(1) No SARs cancelled or expired during the years ended October 31, 2022 and 2021.

Exercise price	SARs outstanding	SARs exercisable	Expiry date
$38.36	7,904	7,904	December 2022
$44.96	21,136	21,136	December 2023
$47.93	28,824	28,824	December 2024
$42.17	19,748	19,748	December 2025
$54.69	16,320	16,320	December 2026
$64.14	16,236	16,236	December 2027
$58.79	24,195	12,453	December 2028
$71.86	29,136	7,698	December 2029
$71.55	22,878	–	December 2030
$96.35	21,464	–	December 2031
	207,841	130,319	

Deferred Stock Unit (DSU) Plans

The DSU Plans are for officers and other designated persons of the Bank and its subsidiaries as well as for directors. These plans allow the Bank to tie a portion of the value of the compensation of participants to the future value of the Bank's common shares. A DSU is a right that has a value equal to the closing price of a common share of the Bank on the Toronto Stock Exchange on the day preceding the award. DSUs generally vest evenly over four years. Additional DSUs are credited to the accounts of participants in an amount equal to the dividends declared on Bank common shares and vest evenly over the same period as the reference DSUs. DSUs may be cashed only when participants retire or leave the Bank or, for directors, when their term ends. The DSU Plans contain provisions for retiring employees whereby participants may continue vesting units in accordance with the stated terms of the award agreement.

During the year ended October 31, 2022, the Bank awarded 39,227 DSUs at a weighted average price of $97.10 (55,545 DSUs at a weighted average price of $75.55 for the year ended October 31, 2021). A total of 551,539 DSUs were outstanding as at October 31, 2022 (514,841 DSUs as at October 31, 2021). For the year ended October 31, 2022, a $1 million compensation expense related to these plans was recognized in the Consolidated Statement of Income ($23 million for the year ended October 31, 2021).

Restricted Stock Unit (RSU) Plan

The RSU Plan is for certain officers and other designated persons of the Bank and its subsidiaries. The objective of this plan is to ensure that the compensation of certain officers and other designated persons is competitive and to foster retention. An RSU represents a right that has a value equal to the average closing price of the Bank's common share, as published by the Toronto Stock Exchange, over the ten trading days preceding the sixth business day in December. RSUs generally vest evenly over three years, although some RSUs vest on the sixth business day of December of the third year following the award date, i.e., the date on which all RSUs expire. Additional RSUs are credited to the accounts of participants in an amount equal to the dividends declared on the Bank's common shares and vest over the same period as the reference RSUs. The RSU Plan contains provisions for retiring employees whereby participants may continue vesting units in accordance with the stated terms of the award agreement.

During the year ended October 31, 2022, the Bank awarded 1,895,489 RSUs at a weighted average price of $99.59 (1,960,326 RSUs at a weighted average price of $72.76 for the year ended October 31, 2021). As at October 31, 2022, a total of 4,203,383 RSUs were outstanding (4,398,019 RSUs as at October 31, 2021). For the year ended October 31, 2022, a $172 million compensation expense related to this plan was recognized in the Consolidated Statement of Income ($256 million for the year ended October 31, 2021).

Performance Stock Unit (PSU) Plan

The PSU Plan is for officers and other designated persons of the Bank. The objective of this plan is to tie a portion of the value of the compensation of these officers and other designated persons to the future value of the Bank's common shares. A PSU represents a right that has a value equal to the average closing price of the Bank's common share, as published by the Toronto Stock Exchange, over the ten trading days preceding the sixth business day in December, adjusted upward or downward according to performance criteria, which is based on the Bank's total shareholder return (TSR) growth index over three years compared to the average TSR growth index of the comparator group composed of Canadian banks over three years. PSUs vest on the sixth business day of December of the third year following the award date, i.e., the date on which all PSUs expire. Additional PSUs are credited to the accounts of participants in an amount equal to the dividends declared on the Bank's common shares and vest over the same period as the reference PSUs. The PSU Plan contains provisions for retiring employees whereby participants may continue vesting units in accordance with the stated terms of the award agreement.

During the year ended October 31, 2022, the Bank awarded 238,082 PSUs at a weighted average price of $99.59 (235,949 PSUs at a weighted average price of $72.76 for the year ended October 31, 2021). As at October 31, 2022, a total of 739,359 PSUs were outstanding (794,440 PSUs as at October 31, 2021). For the year ended October 31, 2022, a $30 million compensation expense related to this plan was recognized in the Consolidated Statement of Income ($42 million for the year ended October 31, 2021).

Deferred Compensation Plan

This plan is exclusively for key employees of the Wealth Management segment. The purpose of this plan is to foster the retention of key employees and promote revenue growth and continuous profitability improvement within the Wealth Management segment. Under this plan, participants can defer a portion of their annual compensation, and the Bank may pay a contribution to key employees when certain financial objectives are met. Amounts awarded by the Bank and the compensation deferred by participants are invested in, among other items, Bank common share units. These share units represent a right that has a value equal to the closing price of the Bank's common share on the Toronto Stock Exchange on the award date. Additional units are credited to the accounts of participants in an amount equal to the dividends declared on the Bank's common shares. Share units representing the amounts awarded by the Bank vest evenly over four years. When a participant retires, or in certain cases when the participant's employment ceases, the participant receives a cash amount representing the value of the vested share units.

During the year ended October 31, 2022, the Bank awarded 129,464 share units at a weighted average price of $94.87 (124,981 share units at a weighted average price of $80.23 for the year ended October 31, 2021). As at October 31, 2022, a total of 2,036,524 share units were outstanding (2,038,003 share units as at October 31, 2021). For the year ended October 31, 2022, a $19 million reversal of the compensation expense related to this plan was recognized in the Consolidated Statement of Income (compensation expense of $83 million for the year ended October 31, 2021).

Employee Share Ownership Plan

Under the Bank's Employee Share Ownership Plan, employees who meet the eligibility criteria can contribute up to 8% of their annual gross salary by way of payroll deductions. The Bank matches 25% of the employee contribution up to a maximum of $1,500 per annum. Bank contributions vest to the employee after one year of uninterrupted participation in the plan. Subsequent contributions vest immediately. The Bank's contributions, amounting to $15 million for the year ended October 31, 2022 ($14 million for the year ended October 31, 2021), were recognized when paid in the *Compensation and employee benefits* item of the Consolidated Statement of Income. As at October 31, 2022, a total of 6,304,689 common shares were held for this plan (6,149,769 common shares as at October 31, 2021).

Plan shares are purchased on the open market and are considered to be outstanding for earnings per share calculations. Dividends paid on the Bank's common shares held for the Employee Share Ownership Plan are used to purchase other common shares on the open market.

Plan Liabilities and Intrinsic Value

Total liabilities arising from the Bank's share-based compensation plans amounted to $716 million as at October 31, 2022 ($816 million as at October 31, 2021). The intrinsic value of these liabilities that had vested as at October 31, 2022 was $359 million ($364 million as at October 31, 2021).

Note 23 – Employee Benefits – Pension Plans and Other Post-Employment Benefit Plans

The Bank offers pension plans that have a defined benefit component and a defined contribution component. The Bank also offers other post-employment benefit plans to eligible employees. The defined benefit component of the pension plans provides benefits based on years of plan participation and average earnings at retirement. The other post-employment benefits include post-employment medical, dental, and life insurance coverage. Since September 19, 2022, the Bank has been offering a new defined contribution component that is available to all new employees upon hiring as well as to current participants of the defined benefit component. Therefore, as of that date, the defined benefit component is no longer offered to new employees. For the defined contribution component, the Bank's base contribution equals a percentage of annual salary and the Bank's additional contribution varies according to the employee's contributions, and the sum of the employee's age and years of continuous service. The defined benefit component of the pension plans is funded, whereas the defined contribution component and the other post-employment benefit plans are not funded. The fair value of the defined benefit component and the present value of the defined benefit obligations were measured as at October 31.

The Bank's most significant pension plan is the *Employee Pension Plan of the National Bank of Canada*; it is registered with OSFI and the Canada Revenue Agency and subject to the *Pension Benefits Standards Act, 1985* and the *Income Tax Act*.

The defined benefit component of the pension plans and the other post-employment benefit plans exposes the Bank to specific risks such as investment performance, changes to the discount rate used to calculate the obligation, the longevity of plan participants, and future inflation. While management believes that the assumptions used in the actuarial valuation process are reasonable, there remains a degree of risk and uncertainty that may cause future results to differ significantly from these assumptions, which could give rise to gains or losses.

According to the Bank's governance rules, the policies and risk management related to the defined benefit component of the pension plans are overseen at different levels by the pension committees, the Bank's management, and the Board's Human Resources Committee. The defined benefit component of the pension plans are examined on an ongoing basis in order to monitor the funding and investment policies, the financial status of the plans, and the Bank's funding requirements.

The Bank's funding policy for the defined benefit component of the pension plans is to make at least the minimum annual contributions required by pension regulators.

For funded plans, the Bank determines whether an economic benefit exists in the form of potential reductions in future contributions and in the form of refunds from the plan surplus, where permitted by applicable regulations and plan provisions.

Defined Benefit Obligation, Assets of the Plans, and Funded Status

As at October 31

	Pension plans – Defined benefit component		Other post-employment benefit plans	
	2022	2021	**2022**	2021
Defined benefit obligation				
Balance at beginning	**4,745**	5,027	**143**	156
Current service cost	**129**	146	**1**	1
Interest cost	**171**	149	**5**	4
Remeasurements				
Actuarial (gains) losses arising from changes in demographic assumptions	**55**	9	**1**	1
Actuarial (gains) losses arising from changes in financial assumptions	**(1,063)**	(538)	**(24)**	(14)
Actuarial (gains) losses arising from experience adjustments	**95**	107	**(6)**	4
Employee contributions	**65**	58		
Benefits paid	**(226)**	(213)	**(9)**	(9)
Balance at end	**3,971**	4,745	**111**	143
Plan assets				
Fair value at beginning	**5,436**	5,153		
Interest income	**191**	148		
Administration cost	**(3)**	(4)		
Remeasurements				
Return on plan assets (excluding interest income)	**(1,113)**	214		
Bank contributions[(1)]	**119**	80		
Employee contributions	**65**	58		
Benefits paid	**(226)**	(213)		
Fair value at end	**4,469**	5,436		
Defined benefit asset (liability) at end	**498**	691	**(111)**	(143)

(1) For fiscal 2023, the Bank expects to pay an employer contribution of $123 million to the defined benefit component of the pension plans.

Defined Benefit Asset (Liability)

As at October 31

	Pension plans – Defined benefit component		Other post-employment benefit plans	
	2022	2021	**2022**	2021
Defined benefit asset included in *Other assets*	**498**	691		
Defined benefit liability included in *Other liabilities*	**–**	–	**(111)**	(143)
	498	691	**(111)**	(143)

Cost for Pension Plans and Other Post-Employment Benefit Plans

Year ended October 31

	Pension plans		Other post-employment benefit plans	
	2022	2021	**2022**	2021
Current service cost(1)	**129**	146	**1**	1
Interest expense (income), net	**(20)**	1	**5**	4
Administration costs	**3**	4		
Expense recognized in *Net income*	**112**	151	**6**	5
Remeasurements(2)				
Actuarial (gains) losses on the defined benefit obligation	**(913)**	(422)	**(29)**	(9)
Return on plan assets(3)	**1,113**	(214)		
Remeasurements recognized in *Other comprehensive income*	**200**	(636)	**(29)**	(9)
	312	(485)	**(23)**	(4)

(1) For the year ended October 31, 2022, the amount of the contributions made by the Bank to the defined contribution component of the pension plans was not significant.
(2) Changes related to the discount rate and to the return on plan assets are reviewed and updated on a quarterly basis. All other assumptions are updated annually.
(3) Excludes interest income.

Allocation of the Fair Value of the Assets of the Defined Benefit Component of the Pensions Plans

As at October 31

	2022			2021		
	Quoted in an active market(1)	**Not quoted in an active market**	**Total**	Quoted in an active market(1)	Not quoted in an active market	Total
Asset classes						
Cash and cash equivalents	**–**	**273**	**273**	–	171	171
Equity securities	**988**	**1,150**	**2,138**	1,290	935	2,225
Debt securities						
Canadian government	**114**	**–**	**114**	175	–	175
Canadian provincial and municipal governments	**–**	**1,769**	**1,769**	–	1,593	1,593
Other issuers	**–**	**264**	**264**	–	1,248	1,248
Other	**–**	**(89)**	**(89)**	–	24	24
	1,102	**3,367**	**4,469**	1,465	3,971	5,436

(1) Unadjusted quoted prices in active markets for identical assets that the Bank can access at the measurement date.

The Bank's investment strategy for plan assets considers several factors, including the time horizon of pension plan obligations and investment risk. For each plan, an allocation range per asset class is defined using a mix of equity and debt securities to optimize the risk-return profile of plan assets and minimize asset/liability mismatching.

The assets of the pension plans may include investment securities issued by the Bank. As at October 31, 2022 and 2021, the assets of the pension plans do not include any securities issued by the Bank.

For fiscal 2022, the Bank and its related entities received $21 million ($15 million in fiscal 2021) in fees from the pension plans for related management, administration and custodial services.

Note 23 – Employee Benefits – Pension Plans and Other Post-Employment Benefit Plans (cont.)

Allocation of the Defined Benefit Obligation by the Status of the Participants in the Defined Benefit Component of the Pension Plans

As at October 31

	Pension plans – Defined benefit component		Other post-employment benefit plans	
	2022	2021	**2022**	2021
Active employees	**41 %**	42 %	**7 %**	13 %
Retirees	**53 %**	51 %	**93 %**	87 %
Participants with deferred vested benefits	**6 %**	7 %		
	100 %	100 %	**100 %**	100 %
Weighted average duration of the defined benefit obligation *(in years)*	**14**	16	**10**	12

Significant Actuarial Assumptions (Weighted Average)

Discount Rate

The discount rate assumption is based on an interest rate curve that represents the yields on corporate AA bonds. Short-term maturities are obtained using a curve based on observed data from corporate AA bonds. Long-term maturities are obtained using a curve based on actual data and extrapolated data.

To measure the obligation related to the defined benefit component of the pension plans and related to the other post-employment benefit plans, the vested benefits that the Bank expects to pay in each future period are discounted to the measurement date using the spot rate associated with each of the respective periods based on the yield curve derived using the above methodology. The sum of discounted benefit amounts represents the defined benefit obligation. An average discount rate that replicates this obligation is then computed.

To better reflect current service cost, a separate discount rate was determined to account for the timing of future benefit payments associated with the additional year of service to be earned by the plan's active participants. Since these benefits are, on average, being paid at a later date than the benefits already earned by participants as a whole (i.e., longer duration), this method results in the use of a generally higher discount rate for calculating current service cost than that used to measure obligations where the yield curve is positively sloped. The methodology used to determine this discount rate is the same as the one used to establish the discount rate for measuring the obligation.

Other Assumptions

For measurement purposes, the estimated annual growth rate for health care costs was 4.77% as at October 31, 2022 (4.52% as at October 31, 2021). Based on the assumption retained, this rate is expected to increase to 5.42% in 2025, then remain at 5.30% from 2026 to 2030, then decrease gradually to 4.05% in 2040 and remain steady thereafter.

Mortality assumptions are a determining factor when measuring the defined benefit obligation. Determining the expected benefit payout period is based on best estimate assumptions regarding mortality. Mortality tables are reviewed at least once a year, and the assumptions made are in accordance with accepted actuarial practice. New results regarding the plans are reviewed and used in calculating best estimates of future mortality.

As at October 31

	Pension plans – Defined benefit component		Other post-employment benefit plans	
	2022	2021	**2022**	2021
Defined benefit obligation				
Discount rate	**5.45 %**	3.55 %	**5.45 %**	3.55 %
Rate of compensation increase	**3.00 %**	3.00 %	**3.00 %**	3.00 %
Health care cost trend rate			**4.77 %**	4.52 %
Life expectancy *(in years)* at 65 for a participant currently at				
Age 65				
Men	**22.4**	21.4	**22.4**	21.4
Women	**24.7**	23.7	**24.7**	23.7
Age 45				
Men	**23.4**	22.4	**23.4**	22.4
Women	**25.6**	24.7	**25.6**	24.7

Year ended October 31

	Pension plans – Defined benefit component		Other post-employment benefit plans	
	2022	2021	**2022**	2021
Pension plan expense				
Discount rate – Current service	**3.70 %**	3.10 %	**3.70 %**	3.10 %
Discount rate – Interest expense (income), net	**3.55 %**	2.90 %	**3.55 %**	2.90 %
Rate of compensation increase	**3.00 %**	3.00 %	**3.00 %**	3.00 %
Health care cost trend rate			**4.52 %**	4.64 %
Life expectancy *(in years)* at 65 for a participant currently at				
Age 65				
Men	**21.4**	21.3	**21.4**	21.3
Women	**23.7**	23.7	**23.7**	23.7
Age 45				
Men	**22.4**	22.4	**22.4**	22.4
Women	**24.7**	24.6	**24.7**	24.6

Sensitivity of Significant Assumptions for 2022

The following table shows the potential impacts of changes to key assumptions on the defined benefit obligation of the pension plans and other post-employment benefit plans as at October 31, 2022. These impacts are hypothetical and should be interpreted with caution, as changes in each significant assumption may not be linear. The Bank has decided to adjust the table by varying the discount rate by 1.00% instead of the 0.25% used in the previous fiscal year to reflect the current economic environment.

As at October 31, 2022

	Pension plans – Defined benefit component	Other post-employment benefit plans
	Change in the obligation	Change in the obligation
Impact of a 1.00% increase in the discount rate	(401)	(11)
Impact of a 1.00% decrease in the discount rate	513	13
Impact of a 0.25% increase in the rate of compensation increase	23	
Impact of a 0.25% decrease in the rate of compensation increase	(25)	
Impact of a 1.00% increase in the health care cost trend rate		5
Impact of a 1.00% decrease in the health care cost trend rate		(4)
Impact of an increase in the age of participants by one year	(82)	(1)
Impact of a decrease in the age of participants by one year	76	1

Projected Benefit Payments

Year ended October 31

	Pension plans – Defined benefit component	Other post-employment benefit plans
2023	235	9
2024	244	8
2025	254	8
2026	264	8
2027	272	7
2028 to 2032	1,489	36

Note 24 – Income Taxes

The Bank's income tax expense reported in the consolidated financial statements is as follows.

Year ended October 31	2022	2021[1]
Consolidated Statement of Income		
Current taxes		
Current year	803	779
Prior period adjustments	(19)	(3)
	784	776
Deferred taxes		
Origination and reversal of temporary differences	110	96
Prior period adjustments	–	10
	110	106
	894	882
Consolidated Statement of Changes in Equity		
Share issuance expenses, other equity instruments and other	(14)	(10)
Impact of an accounting policy change[2]		(49)
	(14)	(59)
Consolidated Statement of Comprehensive Income		
Remeasurements of pension plans and other post-employment benefit plans	(45)	170
Net change in cash flow hedges	3	109
Net fair value change attributable to credit risk on financial liabilities designated at fair value through profit or loss	216	(5)
Other	(90)	50
	84	324
Income taxes	964	1,147

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these consolidated financial statements.
(2) As at October 31, 2021, a $49 million deferred tax liability arising from an accounting policy change was reversed to *Retained earnings* in the Consolidated Statement of Changes in Equity. For additional information, see Note 1 to these consolidated financial statements.

The breakdown of the income tax expense is as follows.

Year ended October 31	2022	2021[1]
Current taxes	933	916
Deferred taxes	31	231
	964	1,147

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these consolidated financial statements.

The temporary differences and tax loss carryforwards resulting in deferred tax assets and liabilities are as follows.

	As at October 31		Year ended October 31		Year ended October 31	
	Consolidated Balance Sheet		Consolidated Statement of Income		Consolidated Statement of Comprehensive Income	
	2022	2021[1]	**2022**	2021[1]	**2022**	2021
Deferred tax assets						
Allowances for credit losses	**235**	225	**10**	(101)	**–**	–
Deferred charges	**317**	354	**(37)**	89	**–**	–
Defined benefit liability – Other post-employment benefit plans	**38**	47	**(1)**	(3)	**(8)**	(2)
Investments in associates	**23**	57	**(34)**	(41)	**–**	–
Leases liabilities	**118**	132	**(14)**	(13)	**–**	–
Deferred revenue	**62**	51	**11**	4	**–**	–
Tax loss carryforwards	**35**	33	**2**	(7)	**–**	–
Other items[2]	**32**	29	**1**	(31)	**–**	–
	860	928	**(62)**	(103)	**(8)**	(2)
Deferred tax liabilities						
Premises and equipment and intangible assets[3]	**(312)**	(299)	**(13)**	(16)	**–**	–
Defined benefit asset – Pension plans	**(127)**	(178)	**(2)**	16	**53**	(168)
Investments in associates	**(2)**	–	**(2)**	4	**–**	–
Other items[4]	**(44)**	(45)	**(31)**	(7)	**32**	(5)
	(485)	(522)	**(48)**	(3)	**85**	(173)
Net deferred tax assets (liabilities)	**375**	406	**(110)**	(106)	**77**	(175)

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these consolidated financial statements.

(2) As at October 31, 2022, the Consolidated Balance Sheet included a $2 million deferred tax asset related to share issuance costs ($1 million as at October 31, 2021) reported in *Retained earnings* on the Consolidated Statement of Changes in Equity.

(3) As at October 31, 2021, a $62 million deferred tax liability arising from an accounting policy change was reversed, of which $49 million was to *Retained earnings* in the Consolidated Statement of Changes in Equity and $13 million to *Income taxes* in the Consolidated Statement of Income. For additional information, see Note 1 to these consolidated financial statements.

(4) As at October 31, 2021, the Consolidated Balance Sheet included a $6 million deferred tax liability related to intangible assets acquired during the Flinks acquisition that had no impact on the Consolidated Statement of Comprehensive Income. For additional information, see Note 31 to these consolidated financial statements.

Net deferred tax assets are included in *Other assets* and net deferred tax liabilities are included in *Other liabilities*.

As at October 31	**2022**	2021[1]
Deferred tax assets	**389**	416
Deferred tax liabilities	**(14)**	(10)
	375	406

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these consolidated financial statements.

Note 24 – Income Taxes (cont.)

According to forecasts, which are based on information available as at October 31, 2022, the Bank believes that the results of future operations will likely generate sufficient taxable income to utilize all the deferred tax assets before they expire.

As at October 31, 2022, the total amount of temporary differences, unused tax loss carryforwards, and unused tax credits for which no deferred tax asset has been recognized was $561 million ($424 million as at October 31, 2021).

As at October 31, 2022, the total amount of temporary differences related to investments in subsidiaries, associates, and joint ventures for which no deferred tax liability has been recognized was $5,636 million ($4,383 million as at October 31, 2021).

The following table provides a reconciliation of the Bank's income tax rate.

Year ended October 31		2022		2021[1]
	$	%	$	%
Income before income taxes	**4,277**	**100.0**	4,022	100.0
Income taxes at Canadian statutory income tax rate	**1,133**	**26.5**	1,066	26.5
Reduction in income tax rate due to				
Tax-exempt income from securities	**(191)**	**(4.5)**	(151)	(3.8)
Non-taxable portion of capital gains	**(1)**	**–**	–	–
Tax rates of subsidiaries, foreign entities and associates	**(71)**	**(1.7)**	(51)	(1.3)
Other items	**24**	**0.6**	18	0.5
	(239)	**(5.6)**	(184)	(4.6)
Income taxes reported in the Consolidated Statement of Income and effective income tax rate	**894**	**20.9**	882	21.9

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these consolidated financial statements.

Notice of Assessment

In September 2022, the Bank was reassessed by the Canada Revenue Agency (CRA) for additional income tax and interest of approximately $150 million (including estimated provincial tax and interest) in respect of certain Canadian dividends received by the Bank during the 2017 taxation year.

In prior fiscal years, the Bank had been reassessed for additional income tax and interest of approximately $725 million (including provincial tax and interest) in respect of certain Canadian dividends received by the Bank during the 2012-2016 taxation years.

In the reassessments, the CRA alleges that the dividends were received as part of a "dividend rental arrangement".

The CRA may issue reassessments to the Bank for taxation years subsequent to 2017 in regard to activities similar to those that were the subject of the above-mentioned reassessments. The Bank remains confident that its tax position was appropriate and intends to vigorously defend its position. As a result, no amount has been recognized in the consolidated financial statements as at October 31, 2022.

Proposed Legislation

On November 4, 2022, the Government of Canada introduced Bill C-32 – *An Act to implement certain provisions of the fall economic statement table in Parliament on November 3, 2022 and certain provisions of the budget tabled in Parliament on April 7, 2022* to implement tax measures applicable to certain entities of banking and life insurer groups, as presented in its budget of April 7, 2022. These tax measures include the Canada Recovery Dividend (CRD), which is a one-time 15% tax on the fiscal 2021 and 2020 average taxable income above $1 billion, and also include a 1.5% increase in the statutory tax rate. The amount of CRD for the Bank is estimated at $32 million. Since these tax measures were not substantively enacted at the reporting date, no amount has been recognized in the Bank's consolidated financial statements as at October 31, 2022.

Note 25 – Earnings Per Share

Diluted earnings per share is calculated by dividing net income attributable to common shareholders by the weighted average number of common shares outstanding after taking into account the dilution effect of stock options using the treasury stock method and any gain (loss) on the redemption of preferred shares.

Year ended October 31	2022	2021[1]
Basic earnings per share		
Net income attributable to the Bank's shareholders and holders of other equity instruments	3,384	3,140
Dividends on preferred shares and distributions on other equity instruments	107	123
Net income attributable to common shareholders	3,277	3,017
Weighted average basic number of common shares outstanding *(thousands)*	337,099	337,212
Basic earnings per share *(dollars)*	9.72	8.95
Diluted earnings per share		
Net income attributable to common shareholders	3,277	3,017
Weighted average basic number of common shares outstanding *(thousands)*	337,099	337,212
Adjustment to average number of common shares *(thousands)*		
Stock options[2]	3,738	3,649
Weighted average diluted number of common shares outstanding *(thousands)*	340,837	340,861
Diluted earnings per share *(dollars)*	9.61	8.85

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these consolidated financial statements.
(2) For the year ended October 31, 2022, the calculation of diluted earnings per share excluded an average number of 1,575,093 options outstanding with a weighted average exercise price of $96.35, given that the exercise price of these options was greater than the average price of the Bank's common shares. For the year ended October 31, 2021, given that the exercise price of the options was lower than the average price of the Bank's common shares, no options were excluded from the diluted earnings per share calculation.

Note 26 – Guarantees, Commitments and Contingent Liabilities

Guarantees

The maximum potential amount of future payments represents the maximum risk of loss if there were a total default by the guaranteed parties, without consideration of recoveries under recourse provisions or insurance policies or from collateral held or pledged. The maximum potential amount of future payments under significant guarantees issued by the Bank is presented in the following table.

As at October 31	2022	2021
Letters of guarantee[1]	6,618	6,083
Backstop liquidity, credit enhancement facilities and other[1]	8,707	7,264
Securities lending	180	–

(1) For additional information on allowances for credit losses related to off-balance-sheet commitments, see Note 7 to these consolidated financial statements.

Letters of Guarantee

In the normal course of business, the Bank issues letters of guarantee. These letters of guarantee represent irrevocable commitments that the Bank will make payments in the event that a client cannot meet its obligations to third parties. The Bank's policy for requiring collateral security with respect to letters of guarantee is similar to that for loans. Generally, the term of these letters of guarantee is less than two years.

Backstop Liquidity and Credit Enhancement Facilities

Facilities to Multi-Seller Conduits

The Bank administers multi-seller conduits that purchase financial assets from clients and finance those purchases by issuing asset-backed commercial paper. The Bank provides backstop liquidity facilities to these multi-seller conduits. As at October 31, 2022, the notional amount of the global-style backstop liquidity facilities totalled $3.2 billion ($2.8 billion as at October 31, 2021), representing the total amount of commercial paper outstanding.

These backstop liquidity facilities can be drawn if the conduits are unable to access the commercial paper market, even if there is no general market disruption. These facilities have terms of less than one year and can be periodically renewed. The terms and conditions of these backstop liquidity facilities do not require the Bank to advance money to the conduits if the conduits are insolvent or involved in bankruptcy proceedings or to fund non-performing assets beyond the amount of the available credit enhancements. The backstop liquidity facilities provided by the Bank have not been drawn to date.

Note 26 – Guarantees, Commitments and Contingent Liabilities (cont.)

The Bank also provides credit enhancement facilities to these multi-seller conduits. These facilities have terms of less than one year and are automatically renewable unless the Bank sends a non-renewal notice. As at October 31, 2022 and 2021, the committed notional value for these facilities was $30 million. To date, the credit enhancement facilities provided by the Bank have not been drawn.

The maximum risk of loss for the Bank cannot exceed the total amount of commercial paper outstanding, i.e., $3.2 billion as at October 31, 2022 ($2.8 billion as at October 31, 2021). As at October 31, 2022, the Bank held $35 million ($22 million as at October 31, 2021) of this commercial paper and, consequently, the maximum potential amount of future payments, taking into account the credit enhancement facilities, was $3.2 billion ($2.7 billion as at October 31, 2021).

CDCC Overnight Liquidity Facility
Canadian Derivatives Clearing Corporation (CDCC) acts as a central clearing counterparty for multiple financial instrument transactions in Canada. Certain fixed-income clearing members of CDCC have provided an equally shared committed and uncommitted global overnight liquidity facility for the purpose of supporting CDCC in its clearing activities of securities purchased under reverse repurchase agreements or sold under repurchase agreements. The objective of this facility is to maintain sufficient liquidity in the event of a clearing member's default. As a fixed-income clearing member providing support to CDCC, the Bank provides a liquidity facility. As at October 31, 2022, the notional amount of the overnight uncommitted liquidity facility amounted to $5.6 billion ($4.5 billion as at October 31, 2021). As at October 31, 2022 and 2021, no amount had been drawn.

Securities Lending
Under securities lending agreements that the Bank has entered into with certain clients who have entrusted it with the safekeeping of their securities, the Bank lends the securities to third parties and indemnifies its clients in the event of loss. To protect itself against any contingent loss, the Bank obtains, as security from the borrower, a cash amount or extremely liquid marketable securities with a fair value greater than that of the securities loaned. No amount has been recognized on the Consolidated Balance Sheet with respect to potential indemnities resulting from securities lending agreements.

Other Indemnification Agreements
In the normal course of business, including securitization transactions and discontinuances of businesses and operations, the Bank enters into numerous contractual agreements under which it undertakes to compensate the counterparty for costs incurred as a result of litigation, changes in laws and regulations (including tax legislation), claims with respect to past performance, incorrect representations or the non-performance of certain restrictive covenants. The Bank also undertakes to indemnify any person acting as a director or officer or performing a similar function within the Bank or one of its subsidiaries or another entity, at the request of the Bank, for all expenses incurred by that person in proceedings or investigations to which he or she is party in that capacity. Moreover, as a member of a securities transfer network and pursuant to the membership agreement and the regulations governing the operation of the network, the Bank granted collateral in favour of the Bank of Canada to guarantee any obligation of the Bank towards the Bank of Canada that could result from the Bank's participation in the securities transfer network. The durations of the indemnification agreements vary according to circumstance; as at October 31, 2022 and 2021, given the nature of the agreements, the Bank is unable to make a reasonable estimate of the maximum potential liability it could be required to pay to counterparties. No amount related to these agreements has been recognized on the Consolidated Balance Sheet.

Commitments

Credit Instruments
In the normal course of business, the Bank enters into various off-balance-sheet commitments. The credit instruments used to meet the financing needs of its clients represent the maximum amount of additional credit that the Bank could be obligated to extend if the commitments were fully drawn.

As at October 31	**2022**	2021
Letters of guarantee[1]	**6,618**	6,083
Documentary letters of credit[2]	**161**	160
Credit card receivables[3]	**9,337**	9,081
Commitments to extend credit[3]	**82,117**	77,983

(1) See the *Letters of Guarantee* item on page 215.
(2) Documentary letters of credit are documents issued by the Bank and used in international trade to enable a third party to present a payment request to the Bank for up to an amount established under specific terms and conditions; these instruments are collateralized by the delivery of the goods to which they are related.
(3) Credit card receivables and commitments to extend credit represent unused portions of authorizations to extend credit, under certain conditions, in the form of loans or bankers' acceptances.

Financial Assets Received as Collateral
As at October 31, 2022, the fair value of financial assets received as collateral that the Bank was authorized to sell or repledge was $92.3 billion ($74.1 billion as at October 31, 2021). These financial assets received as collateral consist of securities related to securities financing and derivative transactions as well as securities purchased under reverse repurchase agreements and securities borrowed.

Other Commitments

The Bank acts as an investor in investment banking activities whereby it enters into agreements to finance external private equity funds and investments in equity and debt securities at market value at the time the agreements are signed. In connection with these activities, the Bank had commitments to invest up to $102 million as at October 31, 2022 ($124 million as at October 31, 2021). In addition, through one of its subsidiaries, the Bank purchases retail loans originated by other financial institutions at market value at the time of purchase. As at October 31, 2022, the Bank had commitments to purchase loans of up to $60 million ($77 million as at October 31, 2021).

Pledged Assets

In the normal course of business, the Bank pledges securities and other assets as collateral. A breakdown of encumbered assets pledged as collateral is provided in the following table. These transactions are concluded in accordance with standard terms and conditions.

As at October 31	2022	2021
Assets pledged to		
Bank of Canada	325	502
Direct clearing organizations[(1)]	1,634	4,158
Assets pledged in relation to		
Derivative financial instrument transactions	5,368	6,339
Borrowing, securities lending and securities sold under reverse repurchase agreements	68,458	72,038
Securitization transactions	26,361	25,173
Covered bonds[(2)]	11,590	9,542
Other	159	4
Total	113,895	117,756

(1) Includes assets pledged as collateral for activities in the systemically important payment system (designated as Lynx) as at October 31, 2022 and 2021.
(2) The Bank has a covered bond program. For additional information, see Notes 13 and 27 to these consolidated financial statements.

Contingent Liabilities

Litigation

In the normal course of business, the Bank and its subsidiaries are involved in various claims relating, among other matters, to loan portfolios, investment portfolios, and supplier agreements, including court proceedings, investigations or claims of a regulatory nature, class actions, or other legal remedies of varied natures.

More specifically, the Bank is involved as a defendant in class actions instituted by consumers contesting, *inter alia*, certain transaction fees or who wish to avail themselves of certain legislative provisions relating to consumer protection. The recent developments in the main legal proceeding involving the Bank are as follows:

Defrance

On January 21, 2019, the Quebec Superior Court authorized a class action against the National Bank and several other Canadian financial institutions. The originating application was served to the Bank on April 23, 2019. The class action was initiated on behalf of consumers residing in Quebec. The plaintiffs allege that non-sufficient funds charges, billed by all of the defendants when a payment order is refused due to non-sufficient funds, are illegal and prohibited by the *Consumer Protection Act*. The plaintiffs are claiming, in the form of damages, the repayment of these charges as well as punitive damages.

It is impossible to determine the outcome of the claims instituted or which may be instituted against the Bank and its subsidiaries. The Bank estimates, based on the information at its disposal, that while the amount of contingent liabilities pertaining to these claims, taken individually or in the aggregate, could have a material impact on the Bank's consolidated results of operations for a particular period, it would not have a material adverse impact on the Bank's consolidated financial position.

Note 27 – Structured Entities

A structured entity is an entity created to accomplish a narrow and well-defined objective and is designed so that voting or similar rights are not the dominant factor in deciding who controls the entity, such as when any voting rights relate solely to administrative tasks and the relevant activities are directed by means of contractual arrangements. Structured entities are assessed for consolidation in accordance with the accounting treatment described in Note 1 to these consolidated financial statements. The Bank's maximum exposure to loss resulting from its interests in these structured entities consists primarily of the investments in these entities, the fair value of derivative financial instrument contracts entered into with them, and the backstop liquidity and credit enhancement facilities granted to certain structured entities.

In the normal course of business, the Bank may enter into financing transactions with third-party structured entities, including commercial loans, reverse repurchase agreements, prime brokerage margin lending, and similar collateralized lending transactions. While such transactions expose the Bank to the counterparty credit risk of the structured entities, this exposure is mitigated by the collateral related to these transactions. The Bank typically has neither power nor significant variable returns resulting from financing transactions with structured entities and does not consolidate such entities. Financing transactions with third-party-sponsored structured entities are included in the Bank's consolidated financial statements and are not included in the table accompanying this note on page 219.

Non-Consolidated Structured Entities

Multi-Seller Conduits

The Bank administers multi-seller conduits that purchase financial assets from clients and finance those purchases by issuing commercial paper backed by the assets acquired. Clients use these multi-seller conduits to diversify their funding sources and reduce borrowing costs, while continuing to manage the financial assets and providing some amount of first-loss protection. Notes issued by the conduits and held by third parties provide additional credit loss protection. The Bank acts as a financial agent and provides these conduits with administrative and transaction structuring services as well as backstop liquidity and credit enhancement facilities under the commercial paper program. These facilities are presented and described in Note 26. The Bank has concluded derivative financial instrument contracts with these conduits, the fair value of which is presented on the Bank's Consolidated Balance Sheet. Although the Bank has the ability to direct the relevant activities of these conduits, it cannot use its power to affect the amount of the returns it obtains, as it acts as an agent. Consequently, the Bank does not control these conduits and does not consolidate them.

Investment Funds

The Bank enters into derivative or other financial instrument contracts with third parties to provide them with the desired exposure to certain investment funds. The Bank economically hedges the risks related to these derivatives by investing in those investment funds. The Bank can also hold economic interests in certain investment funds as part of its investing activities. In addition, the Bank is sponsor and investment manager of mutual funds in which it has insignificant or no interest. The Bank does not control the funds where its holdings are not significant given that, in these circumstances, the Bank either acts only as an agent or does not have any power over the relevant activities. In both cases, it does not have significant exposure to the variable returns of the funds. Therefore, the Bank does not consolidate these funds.

Private Investments

As part of its investment banking operations, the Bank invests in several limited liability partnerships and other incorporated entities. These investment companies in turn invest in operating companies with a view to reselling these investments at a profit over the medium or long term. The Bank does not intervene in the operations of these entities; its only role is that of an investor. Consequently, it does not control these companies and does not consolidate them.

Third-Party Structured Entities

The Bank has invested in third-party structured entities, some of which are asset-backed. The underlying assets consist of residential mortgages, consumer loans, equipment loans, leases, and securities. The Bank does not have the ability to direct the relevant activities of these structured entities and has no exposure to their variable returns, other than the right to receive interest income and dividend income from its investments. Consequently, the Bank does not control these structured entities and does not consolidate them.

The following table presents the carrying amounts of the assets and liabilities relating to the Bank's interests in non-consolidated structured entities, the Bank's maximum exposure to loss from these interests, as well as the total assets of these structured entities. The structured entity Canada Housing Trust is not presented. For additional information, see Note 8 to these consolidated financial statements.

				As at October 31, 2022
	Multi-seller conduits(1)	Investment funds(2)	Private investments(3)	Third-party structured entities(4)
Assets on the Consolidated Balance Sheet				
Securities at fair value through profit or loss	35	335	77	–
Securities at amortized cost	–	–	–	5,163
Derivative financial instruments	–	–	–	38
	35	335	77	5,201
As at October 31, 2021	22	197	54	2,942
Liabilities on the Consolidated Balance Sheet				
Derivative financial instruments	(71)	–	–	(91)
	(71)	–	–	(91)
As at October 31, 2021	(12)	–	–	(8)
Maximum exposure to loss				
Securities	35	335	77	5,201
Liquidity, credit enhancement facilities and commitments	3,155	–	–	468
	3,190	335	77	5,669
As at October 31, 2021	2,754	197	54	3,896
Total assets of the structured entities	3,183	1,772	535	11,197
As at October 31, 2021	2,782	1,791	400	16,883

(1) The main underlying assets, located in Canada, are residential mortgages, automobile loans, automobile inventory financings, and other receivables. As at October 31, 2022, the notional committed amount of the global-style liquidity facilities totalled $3.2 billion ($2.8 billion as at October 31, 2021), representing the total amount of commercial paper outstanding. The Bank also provides series-wide credit enhancement facilities for a notional committed amount of $30 million ($30 million as at October 31, 2021). The maximum exposure to loss cannot exceed the amount of commercial paper outstanding. As at October 31, 2022, the Bank held $35 million in commercial paper ($22 million as at October 31, 2021) and, consequently, the maximum potential amount of future payments as at October 31, 2022 was limited to $3.2 billion ($2.7 billion as at October 31, 2021), which represents the undrawn liquidity and credit enhancement facilities.
(2) The underlying assets are various financial instruments and are presented on a net asset basis. Certain investment funds are in a trading portfolio.
(3) The underlying assets are private investments. The amount of total assets of the structured entities corresponds to the amount for the most recent available period.
(4) The underlying assets are residential mortgages, consumer loans, equipment loans, leases, and securities.

Consolidated Structured Entities

Securitization Entity for the Bank's Credit Card Receivables

In April 2015, the Bank set up Canadian Credit Card Trust II (CCCT II) to continue its credit card securitization program on a revolving basis and to use the entity for capital management and funding purposes.

The Bank provides first-loss protection against the losses, since it retains the excess spread from the portfolio of sold receivables. The excess spread represents the residual net interest income after all the expenses related to this structure have been paid. The Bank also provides second-loss protection as it holds subordinated notes issued by CCCT II. In addition, the Bank acts as an administrative agent and servicer and as such is responsible for the daily administration and management of CCCT II's credit card receivables. The Bank therefore has the ability to direct the relevant activities of CCCT II and can exercise its power to affect the amount of returns it obtains. Consequently, the Bank controls CCCT II and consolidates it.

Multi-Seller Conduit

The Bank administers a multi-seller conduit that purchases various financial assets from clients and finances those purchases by issuing debt securities (including commercial paper) backed by the assets acquired. The clients use this multi-seller conduit to diversify their funding sources and reduce borrowing costs, while continuing to manage the financial assets and providing some amount of first-loss protection. The Bank holds the sole note issued by the conduit and has concluded a derivative financial instrument contract with the conduit. The Bank controls the relevant activities of this conduit through its involvement as a financial agent, agent for administrative and transaction structuring services as well as investor in the conduit's sole note. The Bank's functions and investment in the conduit confer to it decision-making power over the composition of assets acquired by the conduit and the selection of the seller as well as some exposure to the conduit's variable returns. Therefore, the Bank consolidates this conduit.

Note 27 – Structured Entities (cont.)

Investment Funds

The Bank enters into derivative or other financial instrument contracts with third parties to provide them with the desired exposure to certain investment funds. The Bank economically hedges the risks related to these derivatives by investing in those investment funds. The Bank can also hold economic interests in certain investment funds as part of its investing activities. The Bank controls the relevant activities of certain funds through its involvement as an investor and its significant exposure to their variable returns. Therefore, the Bank consolidates these funds.

Covered Bonds

NBC Covered Bond Guarantor (Legislative) Limited Partnership

In December 2013, the Bank established the covered bond legislative program under which covered bonds are issued. It therefore created NBC Covered Bond Guarantor (Legislative) Limited Partnership (the Guarantor) to guarantee payment of the principal and interest owed to the bondholders. The Bank sold uninsured residential mortgages to the Guarantor and granted it loans to facilitate the acquisition of these assets. The Bank acts as manager of the partnership and has decision-making authority over its relevant activities in accordance with the contractual terms governing the covered bond legislative program. In addition, the Bank is able, in accordance with the contractual terms governing the covered bond legislative program, to affect the variable returns of the partnership, which are directly related to the return on the mortgage loan portfolio and the interest on the loans from the Bank. Consequently, the Bank controls the partnership and consolidates it.

Third-Party Structured Entities

In 2018, the Bank, through one of its subsidiaries, provided financing to a third-party structured entity in exchange for a 100% interest in a loan portfolio, the sole asset held by that entity. The Bank controls and therefore consolidates the structured entity, as it has the ability to direct the entity's relevant activities through its involvement in the decision-making process. The Bank is also exposed to the entity's variable returns.

The following table presents the Bank's investments and other assets in the consolidated structured entities as well as the total assets of these entities.

As at October 31		2022		2021
	Investments and other assets	**Total assets[1]**	Investments and other assets	Total assets[1]
Consolidated structured entities				
Securitization entity for the Bank's credit card receivables[2][3]	**1,916**	**2,073**	2,410	2,544
Multiseller conduit[4]	**802**	**802**	256	256
Investment funds[5]	**56**	**56**	121	121
Covered bonds[6]	**17,900**	**18,237**	15,663	16,048
Third-party structured entities[7]	**166**	**166**	169	169
	20,840	**21,334**	18,619	19,138

(1) There are restrictions, arising essentially from regulatory requirements, corporate or securities laws, and contractual arrangements, that limit the ability of some of the Bank's consolidated structured entities to transfer funds to the Bank.
(2) The underlying assets are credit card receivables.
(3) The Bank's investment is presented net of third-party holdings.
(4) The underlying assets, located in Canada, are residential mortgages.
(5) The underlying assets are various financial instruments and are presented on a net asset basis. Certain investment funds are in a trading portfolio.
(6) The underlying assets are uninsured residential mortgage loans of the Bank. The average maturity of these underlying assets is two years. As at October 31, 2022, the total amount of transferred mortgage loans was $17.9 billion ($15.7 billion as at October 31, 2021), and the total amount of covered bonds of $10.4 billion was recognized in *Deposits* on the Consolidated Balance Sheet ($8.8 billion as at October 31, 2021). For additional information, see Note 13 to these consolidated financial statements.
(7) The underlying assets consist of a loan portfolio.

Note 28 – Related Party Disclosures

In the normal course of business, the Bank provides various banking services to related parties and enters into contractual agreements and other operations with related parties. The Bank considers the following to be related parties:

- its key officers and directors and members of their immediate family, i.e., spouses and children under 18 living in the same household;
- entities over which its key officers and directors and their immediate family have control or significant influence through their significant voting power;
- the Bank's associates and joint ventures;
- the Bank's pension plans (for additional information, see Note 23 to these consolidated financial statements).

According to the established definition, the Bank's key officers are those persons having authority and responsibility for planning, directing, and controlling the Bank's activities, directly or indirectly.

Related Party Transactions

As at October 31

	Key officers and directors[1]		Related entities	
	2022	2021	**2022**	2021
Assets				
Mortgage loans and other loans	**22**	21	**449** [2]	143 [2]
Liabilities				
Deposits	**58**	115	**80** [3]	126 [3]
Other	**–**	–	**6**	38

(1) As at October 31, 2022, key officers and directors and their immediate family members were holding $68 million of the Bank's common and preferred shares ($95 million as at October 31, 2021).
(2) As at October 31, 2022, mortgage loans and other loans consisted of: (i) $1 million in loans to the Bank's associates ($1 million as at October 31, 2021) and (ii) $448 million in loans to entities over which the Bank's key officers or directors or their immediate family members exercise control or significant influence through significant voting power ($142 million as at October 31, 2021).
(3) As at October 31, 2022, deposits consisted of: (i) no amount in deposits from the Bank's associates ($1 million as at October 31, 2021) and (ii) $80 million in deposits from entities over which the Bank's key officers or directors and their immediate family members exercise control or significant influence through significant voting power ($125 million as at October 31, 2021).

The contractual agreements and other transactions with related entities as well as with directors and key officers are entered into under conditions similar to those offered to non-related third parties. These agreements did not have a significant impact on the Bank's results. The Bank also offers a deferred stock unit plan to directors who are not Bank employees. For additional information, see Notes 9, 22 and 27 to these consolidated financial statements.

Compensation of Key Officers and Directors

Year ended October 31	**2022**	2021
Compensation and other short-term and long-term benefits	**24**	23
Share-based payments	**21**	22

Note 28 – Related Party Disclosures (cont.)

Principal Subsidiaries of the Bank[1]

			As at October 31, 2022	
Name	Business activity	Principal office address	Voting shares[2]	Investment at cost
Canada and United States				
National Bank Acquisition Holding Inc.	Holding company	Montreal, Canada	100%	1,785
National Bank Financial Inc.	Investment dealer	Montreal, Canada	100%	
NBF International Holdings Inc.	Holding company	Montreal, Canada	100%	
National Bank of Canada Financial Group Inc.	Holding company	New York, NY, United States	100%	
Credigy Ltd.	Holding company	Atlanta, GA, United States	100%	
National Bank of Canada Financial Inc.	Investment dealer	New York, NY, United States	100%	
National Bank Investments Inc.	Mutual funds dealer	Montreal, Canada	100%	441
National Bank Life Insurance Company	Insurance	Montreal, Canada	100%	
Natcan Trust Company	Trustee	Montreal, Canada	100%	238
National Bank Trust Inc.	Trustee	Montreal, Canada	100%	195
National Bank Realty Inc.	Real estate	Montreal, Canada	100%	80
NatBC Holding Corporation	Holding company	Hollywood, FL, United States	100%	31
Natbank, National Association	Commercial bank	Hollywood, FL, United States	100%	
Flinks Technology Inc.	Information technology	Montreal, Canada	86%	144
Other countries				
Natcan Global Holdings Ltd.	Holding company	Sliema, Malta	100%	22
NBC Global Finance Limited	Investment services	Dublin, Ireland	100%	
NBC Financial Markets Asia Limited	Investment dealer	Hong Kong, China	100%	5
Advanced Bank of Asia Limited	Commercial bank	Phnom Penh, Cambodia	100%	621
ATA IT Ltd.	Information technology	Bangkok, Thailand	100%	3

(1) Excludes consolidated structured entities. For additional information, see Note 27 to these consolidated financial statements.
(2) The Bank's percentage of voting rights in these subsidiaries.

Note 29 – Management of the Risks Associated With Financial Instruments

The Bank is exposed to credit risk, market risk, and liquidity and funding risk. The Bank's objectives, policies, and procedures for managing risk and the risk measurement methods are presented in the Risk Management section of the MD&A for the year ended October 31, 2022. Text in grey shading and tables identified with an asterisk (*) in the Risk Management section of the MD&A for the year ended October 31, 2022 are integral parts of these consolidated financial statements.

Residual Contractual Maturities of Balance Sheet Items and Off-Balance-Sheet Commitments

The following tables present balance sheet items and off-balance-sheet commitments by residual contractual maturity as at October 31, 2022 and 2021. The information gathered from this maturity analysis is a component of liquidity and funding management. However, this maturity profile does not represent how the Bank manages its interest rate risk nor its liquidity risk and funding needs. The Bank considers factors other than contractual maturity when assessing liquid assets or determining expected future cash flows.

In the normal course of business, the Bank enters into various off-balance-sheet commitments. The credit instruments used to meet the funding needs of its clients represent the maximum amount of additional credit that the Bank could be obligated to extend if the commitments were fully drawn.

The Bank also has future minimum commitments under leases for premises as well as under other contracts, mainly commitments to purchase loans and contracts for outsourced information technology services. Most of the lease commitments are related to operating leases.

										As at October 31, 2022
	1 month or less	Over 1 month to 3 months	Over 3 months to 6 months	Over 6 months to 9 months	Over 9 months to 12 months	Over 1 year to 2 years	Over 2 years to 5 years	Over 5 years	No specified maturity	Total
Assets										
Cash and deposits with financial institutions	13,084	142	311	18	685	–	–	–	17,630	31,870
Securities										
At fair value through profit or loss	1,527	6,450	5,405	2,267	2,337	3,369	8,634	10,661	46,725	87,375
At fair value through other comprehensive income	5	30	13	20	46	952	4,910	2,296	556	8,828
At amortized cost	602	196	1,876	1,032	95	2,840	5,802	1,073	–	13,516
	2,134	6,676	7,294	3,319	2,478	7,161	19,346	14,030	47,281	109,719
Securities purchased under reverse repurchase agreements and securities borrowed	12,489	1,231	890	–	409	1,044	–	–	10,423	26,486
Loans[1]										
Residential mortgage	1,155	1,124	1,899	2,716	2,364	8,910	53,335	8,059	567	80,129
Personal	423	449	878	1,208	1,036	3,701	17,792	5,085	14,751	45,323
Credit card									2,389	2,389
Business and government	19,980	3,491	3,971	3,586	2,604	6,167	11,452	2,985	19,081	73,317
Customers' liability under acceptances	5,967	554	20	–	–	–	–	–	–	6,541
Allowances for credit losses									(955)	(955)
	27,525	5,618	6,768	7,510	6,004	18,778	82,579	16,129	35,833	206,744
Other										
Derivative financial instruments	2,046	2,804	1,853	1,190	698	1,742	5,182	3,032	–	18,547
Investments in associates and joint ventures									140	140
Premises and equipment									1,397	1,397
Goodwill									1,519	1,519
Intangible assets									1,360	1,360
Other assets[1]	2,633	527	472	161	94	502	107	86	1,376	5,958
	4,679	3,331	2,325	1,351	792	2,244	5,289	3,118	5,792	28,921
	59,911	16,998	17,588	12,198	10,368	29,227	107,214	33,277	116,959	403,740

(1) Amounts collectible on demand are considered to have no specified maturity.

Note 29 – Management of the Risks Associated With Financial Instruments (cont.)

									As at October 31, 2022	
	1 month or less	Over 1 month to 3 months	Over 3 months to 6 months	Over 6 months to 9 months	Over 9 months to 12 months	Over 1 year to 2 years	Over 2 years to 5 years	Over 5 years	No specified maturity	Total
Liabilities and equity										
Deposits[1][2]										
Personal	1,482	1,493	2,955	6,013	6,141	6,418	7,942	4,252	42,115	78,811
Business and government	36,864	11,605	10,644	4,875	3,728	5,988	13,659	4,227	92,640	184,230
Deposit-taking institutions	724	624	54	122	30	–	7	36	1,756	3,353
	39,070	13,722	13,653	11,010	9,899	12,406	21,608	8,515	136,511	266,394
Other										
Acceptances	5,967	554	20	–	–	–	–	–	–	6,541
Obligations related to securities sold short[3]	428	394	634	74	920	1,493	3,948	6,386	7,540	21,817
Obligations related to securities sold under repurchase agreements and securities loaned	16,233	5,445	1,567	3,406	–	22	–	–	6,800	33,473
Derivative financial instruments	2,584	2,302	1,640	1,009	595	2,047	3,570	5,885	–	19,632
Liabilities related to transferred receivables[4]	–	2,672	422	1,329	2,288	4,558	9,612	5,396	–	26,277
Securitization – Credit card[5]	–	–	–	29	–	–	49	–	–	78
Lease liabilities[5]	8	16	23	23	24	87	219	152	–	552
Other liabilities – Other items[1][5]	1,076	46	99	23	39	27	42	92	4,287	5,731
	26,296	11,429	4,405	5,893	3,866	8,234	17,440	17,911	18,627	114,101
Subordinated debt	–	–	–	–	–	–	–	1,499	–	1,499
Equity									21,746	21,746
	65,366	25,151	18,058	16,903	13,765	20,640	39,048	27,925	176,884	403,740
Off-balance-sheet commitments										
Letters of guarantee and documentary letters of credit	180	1,451	1,338	982	1,398	1,292	138	–	–	6,779
Credit card receivables[6]									9,337	9,337
Backstop liquidity and credit enhancement facilities[7]	–	15	5,552	15	–	–	–	–	3,125	8,707
Commitments to extend credit[8]	3,126	9,205	6,179	6,678	3,270	4,066	3,186	39	46,368	82,117
Obligations related to:										
Lease commitments[9]	1	1	2	2	2	6	9	8	–	31
Other contracts[10]	38	42	47	46	47	21	34	–	102	377

(1) Amounts payable upon demand or notice are considered to have no specified maturity.
(2) The *Deposits* item is presented in greater detail than it is on the Consolidated Balance Sheet.
(3) Amounts are disclosed according to the residual contractual maturity of the underlying security.
(4) These amounts mainly include liabilities related to the securitization of mortgage loans.
(5) The *Other liabilities* item is presented in greater detail than it is on the Consolidated Balance Sheet.
(6) These amounts are unconditionally revocable at the Bank's discretion at any time.
(7) In the event of payment on one of the backstop liquidity facilities, the Bank will receive as collateral government bonds in an amount up to $5.6 billion.
(8) These amounts include $44.8 billion that is unconditionally revocable at the Bank's discretion at any time.
(9) These amounts include leases for which the underlying asset is of low value and leases other than for real estate of less than one year.
(10) These amounts include $0.2 billion in contractual commitments related to the head office building under construction.

									As at October 31, 2021[1]	
	1 month or less	Over 1 month to 3 months	Over 3 months to 6 months	Over 6 months to 9 months	Over 9 months to 12 months	Over 1 year to 2 years	Over 2 years to 5 years	Over 5 years	No specified maturity	Total
Assets										
Cash and deposits with financial institutions	7,510	334	374	146	368	–	–	–	25,147	33,879
Securities										
At fair value through profit or loss	1,946	1,929	1,061	702	792	3,037	6,454	9,410	59,480	84,811
At fair value through other comprehensive income	1	–	1	624	63	227	4,867	3,183	617	9,583
At amortized cost	1	181	213	425	804	3,589	5,865	832	–	11,910
	1,948	2,110	1,275	1,751	1,659	6,853	17,186	13,425	60,097	106,304
Securities purchased under reverse repurchase agreements and securities borrowed	1,113	1,199	59	–	371	619	–	–	4,155	7,516
Loans[2]										
Residential mortgage	702	965	1,581	2,587	2,320	8,850	48,455	6,504	578	72,542
Personal	214	315	512	877	843	3,527	16,056	4,308	14,401	41,053
Credit card									2,150	2,150
Business and government	16,842	3,986	2,614	3,508	3,253	6,290	10,180	3,605	10,828	61,106
Customers' liability under acceptances	6,200	618	18	–	–	–	–	–	–	6,836
Allowances for credit losses									(998)	(998)
	23,958	5,884	4,725	6,972	6,416	18,667	74,691	14,417	26,959	182,689
Other										
Derivative financial instruments	1,868	3,678	1,019	2,190	823	1,865	2,491	2,550	–	16,484
Investments in associates and joint ventures									225	225
Premises and equipment									1,216	1,216
Goodwill									1,504	1,504
Intangible assets									1,274	1,274
Other assets[2]	1,829	137	148	129	56	727	88	17	1,399	4,530
	3,697	3,815	1,167	2,319	879	2,592	2,579	2,567	5,618	25,233
	38,226	13,342	7,600	11,188	9,693	28,731	94,456	30,409	121,976	355,621

(1) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these audited consolidated financial statements.
(2) Amounts collectible on demand are considered to have no specified maturity.

Note 29 – Management of the Risks Associated With Financial Instruments (cont.)

As at October 31, 2021

	1 month or less	Over 1 month to 3 months	Over 3 months to 6 months	Over 6 months to 9 months	Over 9 months to 12 months	Over 1 year to 2 years	Over 2 years to 5 years	Over 5 years	No specified maturity	Total
Liabilities and equity										
Deposits(1)(2)										
Personal	1,396	3,433	4,596	2,194	1,945	4,157	6,468	4,914	40,973	70,076
Business and government	24,814	12,796	10,782	5,785	2,691	5,453	10,054	4,765	90,730	167,870
Deposit-taking institutions	1,011	128	38	66	23	1	–	36	1,689	2,992
	27,221	16,357	15,416	8,045	4,659	9,611	16,522	9,715	133,392	240,938
Other										
Acceptances	6,200	618	18	–	–	–	–	–	–	6,836
Obligations related to securities sold short(3)	186	123	182	175	22	3,099	3,743	4,797	7,939	20,266
Obligations related to securities sold under repurchase agreements and securities loaned	7,330	2,668	3,633	246	–	–	–	–	3,416	17,293
Derivative financial instruments	3,048	3,061	1,171	1,921	880	1,485	3,273	4,528	–	19,367
Liabilities related to transferred receivables(4)	–	1,688	1,523	1,054	411	5,501	10,771	4,222	–	25,170
Securitization – Credit card(5)	36	–	–	–	–	28	48	–	–	112
Lease liabilities(5)	7	15	21	22	22	88	214	186	–	575
Other liabilities – Other items(1)(5)	640	477	117	125	100	41	25	75	4,014	5,614
	17,447	8,650	6,665	3,543	1,435	10,242	18,074	13,808	15,369	95,233
Subordinated debt	–	–	–	–	–	–	–	768	–	768
Equity(6)									18,682	18,682
	44,668	25,007	22,081	11,588	6,094	19,853	34,596	24,291	167,443	355,621
Off-balance-sheet commitments										
Letters of guarantee and documentary letters of credit	320	1,561	828	2,092	793	575	74	–	–	6,243
Credit card receivables(7)									9,081	9,081
Backstop liquidity and credit enhancement facilities(8)	15	–	4,502	15	–	–	–	–	2,732	7,264
Commitments to extend credit(9)	2,848	9,139	6,195	6,737	3,872	3,105	3,667	48	42,372	77,983
Obligations related to:										
Lease commitments(10)	1	1	1	1	1	1	3	3	–	12
Other contracts(11)	54	58	50	48	46	152	19	–	124	551

(1) Amounts payable upon demand or notice are considered to have no specified maturity.
(2) The *Deposits* item is presented in greater detail than it is on the Consolidated Balance Sheet.
(3) Amounts have been disclosed according to the residual contractual maturity of the underlying security.
(4) These amounts mainly include liabilities related to the securitization of mortgage loans.
(5) The *Other liabilities* item is presented in greater detail than it is on the Consolidated Balance Sheet.
(6) Certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these audited consolidated financial statements.
(7) These amounts are unconditionally revocable at the Bank's discretion at any time.
(8) In the event of payment on one of the backstop liquidity facilities, the Bank will receive as collateral government bonds in an amount up to $4.5 billion.
(9) These amounts include $40.8 billion that is unconditionally revocable at the Bank's discretion at any time.
(10) These amounts include leases for which the underlying asset is of low value and leases other than for real estate of less than one year.
(11) These amounts include $0.3 billion in contractual commitments related to the head office building under construction.

Note 30 – Segment Disclosures

The Bank carries out its activities in four business segments, which are defined below. For presentation purposes, other activities are grouped in the *Other* heading. Each reportable segment is distinguished by services offered, type of clientele, and marketing strategy. The presentation of segment disclosures is consistent with the presentation adopted by the Bank for the fiscal year beginning November 1, 2021. This presentation reflects the fact that the loan portfolio of borrowers in the "Oil and gas" and "Pipelines" sectors as well as related activities, which had previously been reported in the Personal and Commercial segment, is now reported in the Financial Markets segment. The Bank made this change to better align the monitoring of its activities with its management structure.

Personal and Commercial
The Personal and Commercial segment encompasses the banking, financing, and investing services offered to individuals, advisors and businesses as well as insurance operations.

Wealth Management
The Wealth Management segment comprises investment solutions, trust services, banking services, lending services and other wealth management solutions offered through internal and third-party distribution networks.

Financial Markets
The Financial Markets segment encompasses corporate banking and investment banking and financial solutions for large and mid-size corporations, public sector organizations, and institutional investors.

U.S. Specialty Finance and International (USSF&I)
The USSF&I segment encompasses the specialty finance expertise provided by the Credigy subsidiary; the activities of the ABA Bank subsidiary, which offers financial products and services to individuals and businesses in Cambodia; and the activities of targeted investments in certain emerging markets.

Other
This heading encompasses treasury activities; liquidity management; Bank funding; asset/liability management activities; the activities of the Flinks subsidiary, a fintech company specialized in financial data aggregation and distribution; certain specified items; and the unallocated portion of corporate units.

The segment disclosures are prepared in accordance with the accounting policies described in Note 1 to these consolidated financial statements, except for the net interest income, non-interest income, and income taxes (recovery) of the operating segments, which are presented on a taxable equivalent basis. Taxable equivalent basis is a calculation method that consists in grossing up certain tax-exempt income by the amount of income tax that would have otherwise been payable. The effect of these adjustments is reversed under the *Other* heading. Operations support charges are allocated to each operating segment presented in the business segment results. The Bank assesses performance based on the net income attributable to the Bank's shareholders and holders of other equity instruments. Intersegment revenues are recognized at the exchange amount.

Note 30 – Segment Disclosures (cont.)

Results by Business Segment

Year ended October 31[1]

	Personal and Commercial		Wealth Management		Financial Markets		USSF&I		Other		Total	
	2022	2021	**2022**	2021	**2022**	2021	**2022**	2021	**2022**	2021	**2022**	2021
Net interest income[2]	**2,865**	2,547	**594**	446	**1,258**	1,262	**1,090**	907	**(536)**	(379)	**5,271**	4,783
Non-interest income[2][3]	**1,169**	1,068	**1,781**	1,720	**1,210**	956	**20**	94	**201**	306	**4,381**	4,144
Total revenues	**4,034**	3,615	**2,375**	2,166	**2,468**	2,218	**1,110**	1,001	**(335)**	(73)	**9,652**	8,927
Non-interest expenses	**2,149**	2,008	**1,391**	1,293	**1,022**	906	**344**	315	**324**	381	**5,230**	4,903
Income before provisions for credit losses and income taxes	**1,885**	1,607	**984**	873	**1,446**	1,312	**766**	686	**(659)**	(454)	**4,422**	4,024
Provisions for credit losses	**97**	40	**3**	1	**(23)**	(24)	**66**	(15)	**2**	–	**145**	2
Income before income taxes (recovery)	**1,788**	1,567	**981**	872	**1,469**	1,336	**700**	701	**(661)**	(454)	**4,277**	4,022
Income taxes (recovery)[2]	**474**	416	**260**	231	**389**	353	**143**	146	**(372)**	(264)	**894**	882
Net income	**1,314**	1,151	**721**	641	**1,080**	983	**557**	555	**(289)**	(190)	**3,383**	3,140
Non-controlling interests	**–**	–	**–**	–	**–**	–	**–**	–	**(1)**	–	**(1)**	–
Net income attributable to the Bank's shareholders and holders of other equity instruments	**1,314**	1,151	**721**	641	**1,080**	983	**557**	555	**(288)**	(190)	**3,384**	3,140
Average assets[4]	**140,514**	126,637	**8,226**	7,146	**154,349**	151,240	**18,890**	16,150	**71,868**	62,333	**393,847**	363,506
Total assets	**146,915**	135,209	**8,363**	7,914	**157,803**	141,007	**21,217**	17,393	**69,442**	54,098	**403,740**	355,621

(1) For the year ended October 31, 2021, certain amounts were reclassified, in particular amounts of the loan portfolio of borrowers in the "Oil and gas" and "Pipelines" sectors as well as related activities, which were transferred from the Personal and Commercial segment to the Financial Markets segment. Moreover, certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements (for additional information, see Note 1 to these consolidated financial statements).
(2) For the year ended October 31, 2022, *Net interest income* was grossed up by $234 million ($181 million in 2021), *Non-interest income* was grossed up by $48 million ($8 million in 2021), and an equivalent amount was recognized in *Income taxes (recovery)*. The effects of these adjustments have been reversed under the *Other* heading.
(3) For the *Other* heading of segment results, for the year ended October 31, 2021, the *Non-interest income* item had included a $33 million gain following a remeasurement of the previously held equity interest in Flinks and a $30 million loss related to the fair value measurement of the Bank's equity interest in AfrAsia.
(4) Represents an average of the daily balances for the period, which is also the basis on which segment assets are reported in the business segments.

Results by Geographic Segment

Year ended October 31[1]

	Canada		United States		Other		Total	
	2022	2021	**2022**	2021	**2022**	2021	**2022**	2021
Net interest income	**3,758**	3,592	**773**	623	**740**	568	**5,271**	4,783
Non-interest income[2]	**4,299**	3,992	**18**	106	**64**	46	**4,381**	4,144
Total revenues	**8,057**	7,584	**791**	729	**804**	614	**9,652**	8,927
Non-interest expenses	**4,760**	4,478	**209**	203	**261**	222	**5,230**	4,903
Income before provisions for credit losses and income taxes	**3,297**	3,106	**582**	526	**543**	392	**4,422**	4,024
Provisions for credit losses	**79**	17	**35**	(41)	**31**	26	**145**	2
Income before income taxes	**3,218**	3,089	**547**	567	**512**	366	**4,277**	4,022
Income taxes	**723**	674	**67**	133	**104**	75	**894**	882
Net income	**2,495**	2,415	**480**	434	**408**	291	**3,383**	3,140
Non-controlling interests	**(1)**	–	**–**	–	**–**	–	**(1)**	–
Net income attributable to the Bank's shareholders and holders of other equity instruments	**2,496**	2,415	**480**	434	**408**	291	**3,384**	3,140
Average assets[3]	**324,415**	300,964	**29,988**	27,301	**39,444**	35,241	**393,847**	363,506
Total assets	**336,215**	300,833	**27,986**	23,834	**39,539**	30,954	**403,740**	355,621

(1) For the year ended October 31, 2021, certain amounts have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements. For additional information, see Note 1 to these consolidated financial statements.
(2) For the year ended October 31, 2021, the *Non-interest income* item recorded in Canada included a $33 million gain following a remeasurement of the previously held equity interest in Flinks and a $30 million loss related to the fair value measurement of the Bank's equity interest in AfrAsia.
(3) Represents an average of the daily balances for the period.

Note 31 – Acquisition

Acquisition of Flinks Technology Inc.

On September 8, 2021, the Bank finalized the acquisition of Flinks Technology Inc. (Flinks), a leading fintech company specialized in financial data aggregation and distribution, in which the Bank had already been holding a 30.2% equity interest. Flinks provides services to a wide North American fintech ecosystem and offers attractive data technology solutions. The acquisition strategically positions the Bank in a high-growth market so that it can continue enhancing customer experiences and benefitting from future technology-driven innovations. At the time of acquisition, the amount of which was $73 million in cash for voting preferred shares, the Bank was holding an 82.9% equity interest in Flinks, thereby giving it control thereover. Immediately after the acquisition, the Bank made an additional $30 million investment in voting preferred shares, giving the Bank an 85.9% equity interest in Flinks. The amount of the $73 million purchase price, of the fair value of the previously held equity interest, and of the estimated value of the non-controlling interest established on the acquisition date, exceeded the fair value of the net assets acquired by $101 million. This excess amount was recorded on the Consolidated Balance Sheet as goodwill and mainly represents the future profits expected from Flinks given its favourable position in this growth market. The goodwill is not deductible for tax purposes. The previously held equity interest, accounted for as an associate, was remeasured at fair value, generating a $33 million non-taxable remeasurement gain that was reported in the *Non-interest income – Other* item of the Consolidated Statement of Income for the year ended October 31, 2021. With respect to the presentation of financial results according to business segment, the gain on remeasurement of the previously held equity interest as well as the financial results of Flinks are being reported in the *Other* heading of segment results. The financial results of Flinks have been consolidated into the Bank's financial statements since September 8, 2021.

During the measurement period ended September 8, 2022, the final measurement of Flinks's net assets and the final calculation of working capital adjustments had no significant impact on goodwill.

Note 32 – Event After the Consolidated Balance Sheet Date

Repurchase of Common Shares

On November 29, 2022, the Bank's Board of Directors approved a normal course issuer bid, beginning December 12, 2022, to repurchase for cancellation up to 7,000,000 common shares (representing approximately 2.08% of its outstanding common shares) over the 12-month period ending December 11, 2023. Any repurchase through the Toronto Stock Exchange will be done at market prices. The common shares may also be repurchased through other means authorized by the Toronto Stock Exchange and applicable regulations, including private agreements or share repurchase programs under issuer bid exemption orders issued by the securities regulators. A private purchase made under an exemption order issued by a securities regulator will be done at a discount to the prevailing market price. The amounts that are paid above the average book value of the common shares are charged to *Retained earnings*. This normal course issuer bid is subject to the approval of OSFI and the Toronto Stock Exchange (TSX).

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Statistical Review

As at October 31[1] (millions of Canadian dollars)	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Consolidated Balance Sheet data										
Cash and deposits with financial institutions	**31,870**	33,879	29,142	13,698	12,756	8,802	8,183	7,567	8,086	3,596
Securities	**109,719**	106,304	102,131	82,226	69,783	65,343	64,541	56,040	52,953	53,744
Securities purchased under reverse repurchase agreements and securities borrowed	**26,486**	7,516	14,512	17,723	18,159	20,789	13,948	17,702	24,525	21,449
Loans and acceptances	**206,744**	182,689	164,740	153,251	146,082	136,457	128,036	116,676	106,959	97,338
Other assets	**28,921**	25,233	20,963	14,475	15,661	14,433	17,498	18,105	12,906	12,092
Total assets	**403,740**	355,621	331,488	281,373	262,441	245,824	232,206	216,090	205,429	188,219
Deposits	**266,394**	240,938	215,878	189,566	170,830	156,671	142,066	130,458	119,883	102,111
Other liabilities	**114,101**	95,233	98,589	75,983	76,539	75,589	77,026	72,755	73,163	74,729
Subordinated debt	**1,499**	768	775	773	747	9	1,012	1,522	1,881	2,426
Share capital and other equity instruments										
Preferred shares and other equity instruments	**3,150**	2,650	2,950	2,450	2,450	2,050	1,650	1,023	1,223	677
Common shares	**3,196**	3,160	3,057	2,949	2,822	2,768	2,645	2,614	2,293	2,160
Contributed surplus	**56**	47	47	51	57	58	73	67	52	58
Retained earnings	**15,140**	12,854	10,307	9,227	8,442	7,703	6,706	6,705	5,850	5,055
Accumulated other comprehensive income	**202**	(32)	(118)	16	175	168	218	145	289	214
Non-controlling interests	**2**	3	3	358	379	808	810	801	795	789
Total liabilities and equity	**403,740**	355,621	331,488	281,373	262,441	245,824	232,206	216,090	205,429	188,219
Average assets[2]	**393,847**	363,506	318,087	286,162	265,940	248,351	235,913	222,929	206,680	193,509
Net impaired loans excluding POCI loans[3][4] under IFRS 9	**479**	283	465	450	404					
Net impaired loans excluding POCI loans[4] under IAS 39						206	281	254	248	183
Consolidated Statement of Income data										
Net interest income	**5,271**	4,783	4,255	3,596	3,382	3,436	3,205	2,929	2,761	2,478
Non-interest income	**4,381**	4,144	3,672	3,836	3,784	3,173	2,635	2,817	2,703	2,673
Total revenues	**9,652**	8,927	7,927	7,432	7,166	6,609	5,840	5,746	5,464	5,151
Non-interest expenses	**5,230**	4,903	4,616	4,375	4,100	3,861	3,875	3,665	3,423	3,206
Income before provisions for credit losses and income taxes	**4,422**	4,024	3,311	3,057	3,066	2,748	1,965	2,081	2,041	1,945
Provisions for credit losses	**145**	2	846	347	327	244	484	228	208	181
Income taxes	**894**	882	434	443	534	483	225	234	295	252
Net income	**3,383**	3,140	2,031	2,267	2,205	2,021	1,256	1,619	1,538	1,512
Non-controlling interests	**(1)**	–	42	66	87	84	75	70	69	63
Net income attributable to the Bank's shareholders and holders of other equity instruments	**3,384**	3,140	1,989	2,201	2,118	1,937	1,181	1,549	1,469	1,449

(1) Certain amounts from fiscal years 2017 to 2021 have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements (for additional information, see Note 1 to the consolidated financial statements), aside from the average assets figures for fiscal years 2017 to 2019. Certain amounts from fiscal 2013 have been adjusted to reflect accounting standard changes in fiscal 2014.
(2) Represents an average of the daily balances for the period.
(3) Given the adoption of IFRS 9, all loans classified in Stage 3 of the expected credit loss model are impaired loans. Under IAS 39, loans were considered impaired according to different criteria. Net impaired loans are presented net of allowances for credit losses on Stage 3 loan amounts drawn and, in this table, the net impaired loans presented exclude POCI loans.
(4) Includes customers' liability under acceptances.

As at October 31[1]	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013
Number of common shares[2] *(thousands)*	336,582	337,912	335,998	334,172	335,071	339,592	338,053	337,236	329,297	325,983
Number of common shareholders on record	20,113	20,375	20,674	20,894	21,325	21,542	21,966	22,152	22,394	22,737
Basic earnings per share[2]	$ 9.72	$ 8.95	$ 5.57	$ 6.22	$ 5.93	$ 5.43	$ 3.31	$ 4.56	$ 4.36	$ 4.34
Diluted earnings per share[2]	$ 9.61	$ 8.85	$ 5.54	$ 6.17	$ 5.86	$ 5.37	$ 3.29	$ 4.51	$ 4.32	$ 4.31
Dividend per share[2]	$ 3.58	$ 2.84	$ 2.84	$ 2.66	$ 2.44	$ 2.28	$ 2.18	$ 2.04	$ 1.88	$ 1.70
Share price[2]										
High	$ 105.44	$ 104.32	$ 74.79	$ 68.02	$ 65.63	$ 62.74	$ 47.88	$ 55.06	$ 53.88	$ 45.24
Low	$ 83.12	$ 65.54	$ 38.73	$ 54.97	$ 58.69	$ 46.83	$ 35.83	$ 40.75	$ 41.60	$ 36.18
Close	$ 92.76	$ 102.46	$ 63.94	$ 68.02	$ 59.76	$ 62.61	$ 47.88	$ 43.31	$ 52.68	$ 45.24
Book value[2][3]	$ 55.24	$ 47.44	$ 39.56	$ 36.64	$ 34.31	$ 31.50	$ 28.52	$ 28.26	$ 25.76	$ 22.97
Dividends on preferred shares										
Series 15	–	–	–	–	–	–	–	–	–	$ 0.2444
Series 16	–	–	–	–	–	–	–	–	$ 1.2125	$ 1.2125
Series 20	–	–	–	–	–	–	–	$ 1.5000	$ 1.5000	$ 1.5000
Series 21	–	–	–	–	–	–	–	–	–	$ 1.0078
Series 24	–	–	–	–	–	–	–	–	$ 0.4125	$ 1.6500
Series 26	–	–	–	–	–	–	–	–	$ 0.4125	$ 1.6500
Series 28	–	–	–	–	–	$ 0.9500	$ 0.9500	$ 0.9500	$ 0.9500	$ 0.9728
Series 30	$ 1.0063	$ 1.0063	$ 1.0063	$ 1.0156	$ 1.0250	$ 1.0250	$ 1.0250	$ 1.0250	$ 0.7849	–
Series 32	$ 0.9598	$ 0.9598	$ 0.9636	$ 0.9750	$ 0.9750	$ 0.9750	$ 0.9750	$ 1.0760	–	–
Series 34	–	$ 0.7000	$ 1.4000	$ 1.4000	$ 1.4000	$ 1.4000	$ 1.1373	–	–	–
Series 36	–	$ 1.0125	$ 1.3500	$ 1.3500	$ 1.3500	$ 1.3500	$ 0.5733	–	–	–
Series 38	$ 1.1125	$ 1.1125	$ 1.1125	$ 1.1125	$ 1.1125	$ 0.4724	–	–	–	–
Series 40	$ 1.1500	$ 1.1500	$ 1.1500	$ 1.1500	$ 0.9310	–	–	–	–	–
Series 42	$ 1.2375	$ 1.2375	$ 1.2375	$ 1.2375	$ 0.5323	–	–	–	–	–
Financial ratios										
Return on common shareholders' equity[3]	18.8 %	20.7 %	14.6 %	18.0 %	18.4 %	18.1 %	11.7 %	16.9 %	17.9 %	20.1 %
Return on average assets[3]	0.86 %	0.86 %	0.64 %	0.81 %	0.84 %	0.81 %	0.53 %	0.73 %	0.74 %	0.78 %
Regulatory ratios under Basel III[4]										
Capital ratios[5]										
CET1	12.7 %	12.4 %	11.8 %	11.7 %	11.7 %	11.2 %	10.1 %	9.9 %	9.2 %	8.7 %
Tier 1	15.4 %	15.0 %	14.9 %	15.0 %	15.5 %	14.9 %[6]	13.5 %	12.5 %[7]	12.3 %[8]	11.4 %
Total	16.9 %	15.9 %	16.0 %	16.1 %	16.8 %	15.1 %[6]	15.3 %	14.0 %[9]	15.1 %[8]	15.0 %
Leverage ratio	4.5 %	4.4 %	4.4 %	4.0 %	4.0 %	4.0 %	3.7 %	4.0 %		
TLAC ratio[10]	27.7 %	26.3 %	23.7 %							
TLAC leverage ratio[10]	8.1 %	7.8 %	7.0 %							
Liquidity coverage ratio (LCR)[11]	140 %	154 %	161 %	146 %	147 %	132 %	134 %	131 %		
Net stable funding ratio (NSFR)[11]	117 %	117 %								
Other information										
Number of employees[12][13]	28,482	25,966	25,604	24,557	22,426	20,584	20,600	19,026	18,725	16,675
Branches in Canada	378	384	403	422	428	429	450	452	452	453
Banking machines in Canada	939	927	940	939	937	931	938	930	935	937

(1) Certain amounts from fiscal years 2017 to 2021 have been adjusted to reflect an accounting policy change applicable to cloud computing arrangements (for additional information, see Note 1 to the consolidated financial statements), aside from the return on common shareholders' equity and return on average assets figures for fiscal years 2017 to 2019. Certain amounts from fiscal 2013 have been adjusted to reflect accounting standard changes in fiscal 2014.
(2) The figures for 2014 and 2013 have been adjusted to reflect the stock dividend paid in 2014.
(3) See the Glossary section on pages 122 to 125 for details on the composition of these measures.
(4) Ratios as at October 31, 2022, 2021 and 2020 are calculated in accordance with the Basel III rules, as set out in OSFI's *Capital Adequacy Requirements Guideline* and *Leverage Requirements Guideline,* and reflect the transitional measures granted by OSFI.
(5) The October 31, 2013 ratios have not been adjusted to reflect changes in accounting standards.
(6) Taking into account the redemption of the Series 28 preferred shares on November 15, 2017.
(7) Taking into account the redemption of the Series 20 preferred shares on November 15, 2015.
(8) Taking into account the redemption of the Series 16 preferred shares on November 15, 2014.
(9) Taking into account the redemption of the Series 20 preferred shares on November 15, 2015 and the $500 million redemption of notes on November 2, 2015.
(10) The TLAC ratio and the TLAC leverage ratio are calculated in accordance with OSFI's *Total Loss Absorbing Capacity Guideline*.
(11) The LCR ratio and the NSFR ratio are calculated in accordance with OSFI's *Liquidity Adequacy Requirements Guideline*.
(12) Full-time equivalent.
(13) Includes employees from Credigy Ltd. and Advanced Bank of Asia Limited for fiscal years 2014 to 2022.

Information for Shareholders

Description of Share Capital

The authorized share capital of the Bank consists of an unlimited number of common shares, without par value, an unlimited number of first preferred shares, without par value, issuable for a maximum aggregate consideration of $5 billion, and 15 million second preferred shares, without par value, issuable for a maximum aggregate consideration of $300 million. As at October 31, 2022, the Bank had a total of 336,582,124 common shares and 66,000,000 first preferred shares issued and outstanding.

Stock Exchange Listings

The Bank's common shares and Series 30, 32, 38, 40 and 42 First Preferred Shares are listed on the Toronto Stock Exchange in Canada.

Issue or class	Ticker symbol
Common shares	NA
First Preferred Shares	
Series 30	NA.PR.S
Series 32	NA.PR.W
Series 38	NA.PR.C
Series 40	NA.PR.E
Series 42	NA.PR.G

Number of Registered Shareholders

As at October 31, 2022, there were 20,113 common shareholders recorded in the Bank's common share register.

Dividends

Dividend Dates in Fiscal 2023
(subject to approval by the Board of Directors of the Bank)

Record date	Payment date
Common shares	
December 26, 2022	February 1, 2023
March 27, 2023	May 1, 2023
June 26, 2023	August 1, 2023
September 25, 2023	November 1, 2023
Preferred shares,	
Series 30, 32, 38, 40 and 42	
January 6, 2023	February 15, 2023
April 5, 2023	May 15, 2023
July 6, 2023	August 15, 2023
October 6, 2023	November 15, 2023

Dividends Declared on Common Shares During Fiscal 2022

Record date	Payment date	Dividend per share ($)
December 27, 2021	February 1, 2022	0.87
March 28, 2022	May 1, 2022	0.87
June 27, 2022	August 1, 2022	0.92
September 26, 2022	November 1, 2022	0.92

Dividends Declared on Preferred Shares During Fiscal 2022

		Dividend per share ($)				
Record date	Payment date	Series 30	Series 32	Series 38	Series 40	Series 42
January 6, 2022	February 15, 2022	0.2516	0.2399	0.2781	0.2875	0.3094
April 5, 2022	May 15, 2022	0.2515	0.2400	0.2782	0.2875	0.3094
July 6, 2022	August 15, 2022	0.2516	0.2399	0.2781	0.2875	0.3093
October 6, 2022	November 15, 2022	0.2516	0.2400	0.2781	0.2875	0.3094

Dividends paid are "eligible dividends" in accordance with the *Income Tax Act* (Canada).

Dividend Reinvestment and Share Purchase Plan

National Bank has a Dividend Reinvestment and Share Purchase Plan for holders of its common and preferred shares under which they can acquire common shares of the Bank without paying commissions or administration fees. Participants acquire common shares through the reinvestment of cash dividends paid on the shares they hold or through optional cash payments of at least $1 per payment, up to a maximum of $5,000 per quarter.

For additional information, shareholders may contact National Bank's registrar and transfer agent, Computershare Trust Company of Canada, at 1-888-838-1407. To participate in the plan, National Bank's beneficial or non-registered common shareholders must contact their financial institution or broker.

Direct Deposit
Shareholders may elect to have their dividend payments deposited directly via electronic funds transfer to their bank account at any financial institution that is a member of the Canadian Payments Association. To do so, they must send a written request to the transfer agent, Computershare Trust Company of Canada.

Head Office

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Website: nbc.ca

Annual Meeting

The Annual Meeting of Holders of Common Shares of the Bank will be held on April 21, 2023.

Corporate Social Responsibility Statement

The information will be available in March 2023 on the Bank's website at nbc.ca.

Communication with Shareholders

For information about stock transfers, address changes, dividends, lost certificates, tax forms and estate transfers, shareholders of record may contact the transfer agent at the following address:

Computershare Trust Company of Canada

Share Ownership Management
100 University Avenue, 8th Floor
Toronto, Ontario M5J 2Y1 Canada

Telephone: 1-888-838-1407
Fax: 1-888-453-0330
E-mail: *service@computershare.com*
Website: computershare.com

Shareholders whose shares are held by a market intermediary are asked to contact the market intermediary concerned.

Other shareholder inquiries can be addressed to:
Investor Relations
National Bank of Canada
600 De La Gauchetière Street West, 7th Floor
Montreal, Quebec H3B 4L2 Canada

Telephone: 1-866-517-5455
E-mail: investorrelations@nbc.ca
Website: nbc.ca/investorrelations

Caution Regarding Forward-Looking Statements

From time to time, National Bank of Canada makes written and oral forward-looking statements, including in this Annual Report, in other filings with Canadian regulators, in reports to shareholders, in press releases and in other communications. All such statements are made pursuant to the Canadian and American securities legislation and the provisions of the United States *Private Securities Litigation Reform Act of 1995*.

Additional information about these statements can be found on page 15 of this Annual Report.

Trademarks

The trademarks belonging to National Bank of Canada and used in this report include National Bank of Canada, National Bank, NBC, National Bank Financial, National Bank Financial-Wealth Management, Private Banking 1859, National Bank Direct Brokerage, National Bank Investments, National Bank Independent Network, National Bank Trust, National Bank Life Insurance, Natcan Trust Company, National Bank Realty, Natbank and their respective logos. Certain trademarks owned by third parties are also mentioned in this report.

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