CITIGROUP GLOBAL MARKETS LIMITED

(Registered Number: 01763297)

ANNUAL REPORT AND FINANCIAL STATEMENTS

for the year ended 31 December 2022

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CITIGROUP GLOBAL MARKETS LIMITED

STRATEGIC REPORT

for the year ended 31 December 2022

The Directors present their strategic report on Citigroup Global Markets Limited (CGML or the Company) on a standalone basis for the year ended 31 December 2022.

1. Introduction

CGML is a wholly owned, indirect subsidiary of Citigroup Inc (Citi), limited by shares. It is Citi's international broker dealer, providing products and services for institutional clients. It is a market maker in equity, fixed income and commodity products across cash, over-the-counter (OTC) derivatives and exchange-traded markets, as well as a provider of investment banking, capital markets and advisory services. CGML operates globally, generating the majority of its business from the Europe, Middle East and Africa (EMEA) region with the remainder coming from Asia and the Americas.

CGML is authorised by the Prudential Regulation Authority (PRA) and regulated by the PRA and Financial Conduct Authority (FCA). CGML is also a Commodity Futures Trading Commission (CFTC) registered swap dealer, and United States Securities Exchange Commission (SEC) registered security-based swap dealer, and is considered a Risk-Taking Operating Material Legal Entity in Citi's Global Resolution Plan. As at 31 December 2022, it had four branch offices and four subsidiaries, listed below. These are not materially active except for the Israel branch, Citigroup Global Markets Europe AG, and Citigroup Global Markets Funding Luxembourg SCA. The Italy branch of CGML is currently in liquidation, which is expected to be completed in 2023. During 2022, the Czech Republic branch of CGML was liquidated. Changes after the reporting period are discussed in the Strategic and Directors' Reports and in Note 34 'Events after the reporting period'.

EU Branches	**Subsidiaries**
Czech Republic (liquidated)	Citigroup Global Markets Europe AG (Germany)
Italy (in liquidation)	Citigroup Global Markets Funding Luxembourg SCA (Luxembourg)
Non-EU Branches	Citigroup Global Markets Funding Luxembourg GP S.a.R.L. (Luxembourg)
Israel	Citi Global Wealth Management S.A.M. (Monaco)
Switzerland	
UAE	

CGML's business supports the Institutional Clients Group (ICG) segment of Citi's operations and is almost entirely wholesale in nature, with a client base that encompasses corporates, financial institutions, institutional and other investors, as well as governments and public sector entities. CGML's principal business activities are summarised below:

Business	***Activities***
Equities	Comprises: • Equity Markets, undertakes market making in, and provides clients with exposure to, equities, convertible bonds, listed and OTC derivatives, structured products, securities financing, and electronic trading. • Multi Asset Group develops asset-based investment and hedging solutions for distributors and institutional investors, with a particular focus on insurance companies, asset managers (including hedge funds) and pension funds. • Prime Finance, provides globally co-ordinated prime brokerage services to clients, including securities lending, margin financing, reporting, clearing, custody and structured financing solutions. • Delta One, which provides access, financing, and investment solutions to a broad spectrum of clients (institutional, corporates and hedge funds) via synthetic products such as swaps, exchange-traded funds (ETFs) and access products. • Futures and OTC Clearing, which provides clients with access to global liquidity venues, global execution on all major futures exchanges, multi-asset clearing services on global central counterparties (CCPs) and delivery of collateral solutions.

1. Introduction (continued)

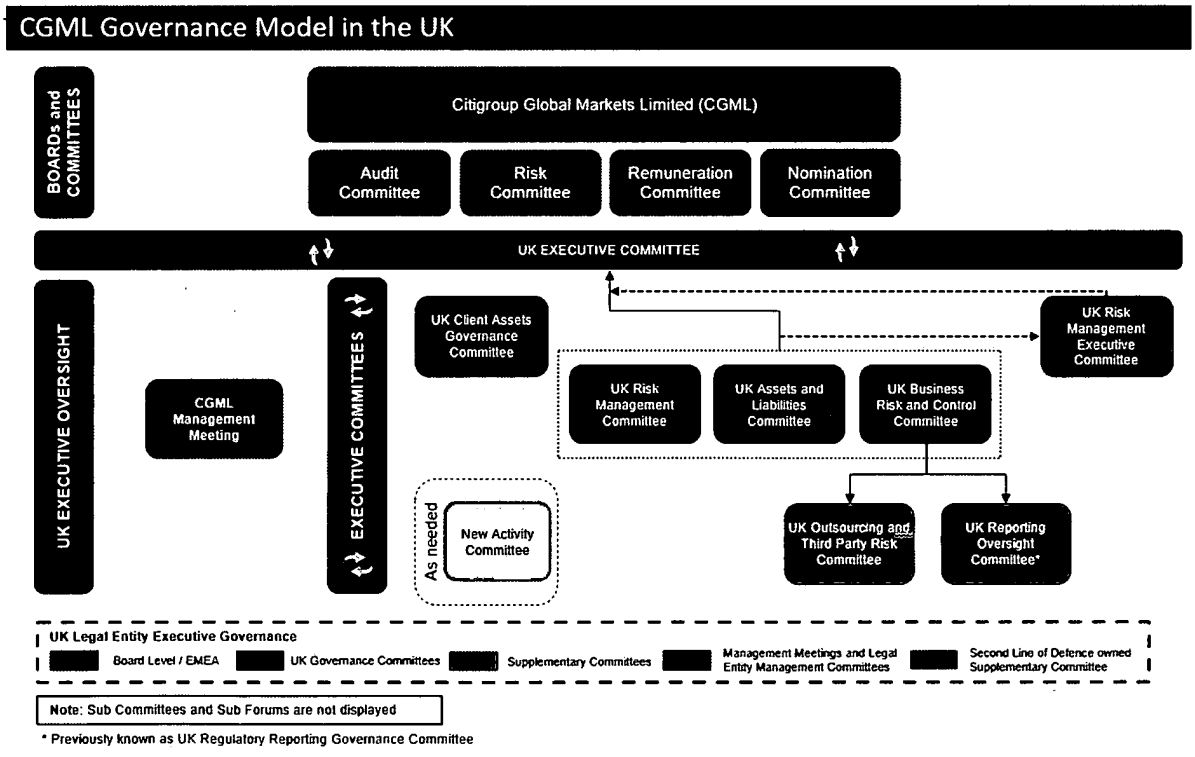
Business	*Activities*
Rates	Makes markets and facilitates client activity across interest rate products in traded markets, including sovereign and supranational bonds, inflation bonds, as well as interest rate, cross currency and inflation derivatives. The business conducts much of its client facing activity on CGML with some market risk transferred to other Citi affiliates.
Global Spread Products	Provides clients with access to investment grade, high yield and distressed bond markets, as well as credit derivatives and structured credit products.
Commodities	Acts as a principal in commodity markets worldwide, providing risk management services to clients, acting as a liquidity provider and providing investor solutions and working capital facilities for commodity inventories.
Banking, Capital Markets and Advisory (BCMA)	BCMA provides structuring and syndication of securities and financing transactions in the bond capital markets and delivers equity and equity-linked solutions in financing acquisitions, funding capital expenditures, managing liabilities, monetising assets, and hedging exposures. The business also provides advisory services to clients in relation to mergers and acquisitions, corporate broking and the raising and restructuring of capital.

A number of CGML's functional operations are carried out in locations outside London, including at Citi Service Centres in Belfast, Budapest, and Warsaw as well as in locations outside the region. In addition, CGML makes use of a number of affiliated and third party outsourcing arrangements.

2. CGML Corporate Governance Report and Principal Risks

For the year ended 31 December 2022, under The Companies (Miscellaneous Reporting) Regulations 2018, the Company has applied the Wates Corporate Governance Principles for Large Private Companies (published by the Financial Reporting Council (FRC) in December 2018 and available on the FRC website).

The chart below highlights the main components of CGML's governance structure, within Citi's regional and UK management and governance framework during 2022:



2. CGML Corporate Governance Report and Principal Risks (continued)

Principle 1 – Purpose and Leadership

Purpose

CGML's purpose, in line with that of Citi, is to serve as a trusted partner to its clients by responsibly providing financial services that enable growth and economic progress. CGML's core activities are being a dealer, market maker and underwriter and providing advisory services. Whilst carrying out these activities, it ensures that actions are always in its clients' interests, create economic value and are systemically responsible.

Strategy

CGML's strategic purpose was discussed and formalised during its annual Strategy Day, under the direction of the Board of Directors (the Board). The Strategy Day looks at the year ahead and drives the Board agenda setting. The Strategy Day is an example of ensuring good dialogue with Group, the CGML workforce and wider stakeholders. The key strategic priorities for CGML for the year ended 31 December 2022 were as follows:

- Client excellence and delivering Citi's business strategy;
- Sustained profitability and efficient management of financial and capital resources;
- Improve infrastructure and data to drive resilience, efficiency, and a better client experience;
- Ensure strong governance and controls remain the cornerstone of our success; and
- Attract, retain, and develop diverse talent and shape good culture.

The CGML Strategic and Financial Plan 2022-2024 was documented and approved by the CGML Board following the Strategy Day and is used to clearly articulate the CGML strategic priorities internally.

Values and Culture

The Board and senior management are instrumental in shaping good culture and conduct for the Company. The Company's Leadership Principles (take ownership, deliver with pride, and succeed together), represent the qualities, behaviours and expectations employees must exhibit to deliver on the mission of enabling growth and economic progress. Employees contribute to creating a culture that drives client excellence, controls excellence and operational excellence.

Diversity and Inclusion are recognised as part of CGML's core values and the Company nurtures a culture in which employees hold themselves accountable for managing risk and where they continue to take pride in always doing the right thing. Doing the right thing includes taking ownership and showing empathy for colleagues, clients and communities, treating others with respect and civility, and continuing to invest in colleagues from all backgrounds, valuing and learning from different perspectives and breaking down barriers. CGML monitors and measures its 'cultural health' and conduct at governance and management meetings and uses a range of measures to help adjust and improve itself. CGML is also fully engaged with Citi's New Way - a culture transformation programme designed to drive a culture of excellence and accountability that strengthens risk management and the control environment.

As part of the annual Strategy Day, the CGML Board reviewed the Culture target state and the Culture framework and will continue to monitor progress through a CGML Board Culture Working Group chaired by a non-executive director of the Board. The working group reports on culture oversight initiatives to the Board each quarter. The CGML Board expects the CGML management to discuss and demonstrate, in every Board update, how the decisions they make, the habits they practise, the ways in which they invest resources and rewards and their leadership tone support and reinforce the culture Citi is driving. During 2022, working with the Accountability, Culture and Talent (ACT) programme, the CGML Board created two questions (with corresponding guidance) for inclusion in each submission to the CGML Risk Committee and CGML Audit Committee with the intent of encouraging management to consider and evidence culture within every aspect of their work and to give the Board visibility into how management are considering and evaluating cultural considerations.

2. CGML Corporate Governance Report and Principal Risks (continued)

Citi's Code of Conduct prohibits discrimination and harassment and highlights procedures for speaking up and reporting concerns about conduct or situations that may put the Company or its customers at risk. For further details please see the Mission and Strategy section on page 11.

Principle 2 – Board Composition

The details of each member of the Board during the year ended 31 December 2022 can be found in the Directors' Report on page 19.

To ensure that the balance of responsibilities, accountabilities and decision making across the Company are effectively maintained, CGML has appointed a separate Chair and Chief Executive.

As at 31 December 2022, the Board consisted of six Executive Directors and five Independent Non-Executive Directors.

The Executive Directors are:

- James Bardrick - CGML Chief Executive Officer (CEO)
- Francisco Tobias Marin - EMEA Chief Financial Officer (CFO)
- Amit Raja - EMEA Head of Markets
- Zoe Wimborne - EMEA Chief Risk Officer (CRO)
- Deepak Jain - Global Head of Independent Compliance Risk Management (ICRM) Special Projects
- Evelin Ducsai - EMEA Head of Operations and Technology and Chief Information Officer (CIO) [subject to regulatory approval]

The Independent Non-Executive Directors are:

- Jonathan Moulds - Chair of CGML Board, Chair of CGML Nomination Committee
- William Fall - Chair of CGML Risk Committee
- Sally Clark - Chair of CGML Audit Committee
- Peter Henry - Chair of Remuneration Committee and Citigroup Inc. Board member
- Iain Plunkett - Operations, Technology & Transformation

The composition of the CGML Board reflects the Company's size and is appropriate for the scale, complexity, regulatory oversight, and systemic importance of CGML within Citi. Evelin Ducsai, EMEA Head of O&T and CIO, Amit Raja, EMEA Head of Markets and Francisco Tobias, EMEA CFO joined the Board as Executive Directors in 2022 replacing their predecessors. Peter Henry joined the Board in November 2022 as an Independent Non-Executive Director replacing Diana Taylor as the Group Board representative. Each new Board Director brings a wealth of experience in the financial services industry and subsidiary governance.

The Independent Non-Executive Directors bring experience in risk, finance, operations, transformation and audit, in addition to perspectives and challenge from their roles within the industry and also outside the sectors in which CGML operates. All Directors have access to the advice and services of the Company Secretary's office and may take professional advice at the Company's expense. The duties of the Board are executed partially through committees. The Independent Non-Executive Directors attend and act as chair to relevant committees (as noted on page 6) so that they are able to challenge and influence a broad range of areas affecting CGML. As highlighted above, one Non-Executive Director, Peter Henry, is also a Non-Executive Director of the ultimate parent, Citigroup Inc.

The Board comprises and is supported by nine of Citi's UK Senior Managers (as defined under the Senior Manager and Certification Regime (SM&CR) from the PRA and the FCA) including the Chief Executive Officer and the relevant EMEA business heads together with the Regional heads of Finance, O&T and Risk. Three of the four Non-Executive Directors, who are Board Committee chairs, are Senior Managers and they are subject to all aspects of the SM&CR, including regulatory pre-approval and conduct rules as well as their statutory duty of responsibility.

2. CGML Corporate Governance Report and Principal Risks (continued)

Principle 2 – Board Composition (continued)

The SM&CR focuses on a small number of individuals (Senior Managers) who hold key roles or have overall responsibility for whole areas of relevant UK entities and branches. Senior Managers require regulatory pre-approval to perform a Senior Management Function (SMF). The SM&CR requires Senior Managers to take reasonable steps to avoid a breach occurring or continuing. As part of the Individual Accountability Regime (of which the SM&CR is a part), CGML maintains a Management Responsibilities Map which documents the firm's governance arrangements.

Balance and diversity

The percentage of female Directors has decreased from 40% to 27%% during 2022; however, the percentage of those from an ethnic minority background has increased from 9% to 27%. Citi is committed to making the Company an ever-more inclusive environment, thereby fostering a more diverse workforce which should increase diversity at the most senior levels. We will be demonstrating our commitment to this area with various initiatives and ensuring CGML is increasingly viewed as an employer of choice.

Effectiveness

The Board operates on a quarterly meeting cycle every year together with two additional days for Board Strategy, and more often as required. The Committees meet more frequently with six to eight meetings per year. In addition to the quarterly meetings, the Board receives technical training in the form of in-depth and targeted education sessions that cover a variety of topics including Technology, Cyber, Operational Resilience, and Recovery and Resolution.

The Board ensures it has the relevant knowledge and skills to fulfil its responsibilities and keep pace with growth and innovation. The CGML Nomination Committee undertakes an annual skills assessment exercise and has used the resulting gap analysis to inform its succession planning and continuing education programme for the year ahead.

The Board considers these exercises important in order to identify key areas for future opportunities and improvements. The Board of CGML is focused on being equipped to meet tomorrow's challenges, opportunities and emerging risks, the rapidly changing market, the evolution of competition, trends in its clients' business models and experience expectations, and the effect of new technologies.

Principle 3 – Director Responsibilities

Accountability

CGML adheres to and seeks to exceed the corporate governance standards expected from a regulated firm of its size and structure. It recognises that success is measured in large part by its ability to deliver a progressive and effective governance model that is both adaptive to the pace of change and robust enough to withstand the challenges it faces. The governance model also reflects the need to demonstrate influence and oversight of areas where the Board relies on other parts of the Group to achieve the outcomes needed to deliver its own strategies. It requires the senior executives of CGML to operate an effective governance environment coupled with a strong culture of risk management and controls to support good decision-making.

The Board delegates authority for oversight of the day-to-day management of the Company to the UK Executive Committee which meets monthly. It is chaired by the Citi EMEA Chief Executive Officer and SMF 7 Group Entity Manager and membership includes the key UK Senior Managers. CGML also has a dedicated monthly management meeting, chaired by the CEO of CGML to review and discuss specific legal entity focused matters.

2. CGML Corporate Governance Report and Principal Risks (continued)

***Principle 3 – Director Responsibilities** (continued)*

Committees

The Independent Non-Executive Directors are independent and have no material business or other relationships with the Company that might influence their independence or judgement. Certain governance responsibilities are delegated to other Board committees: Audit, Remuneration, Nomination and Risk. Each of these Board committees are chaired by Non-Executive Directors and have a separate charter, which include the authorities delegated to them by the Board.

Integrity of Information

The Board receives regular and timely information (at least monthly), via calls or meetings with the CGML CEO on all key aspects of the business including its financial performance, risk management, control environment, market and competitive conditions, Citi Global and EMEA developments and global and local governance and regulatory priorities. CGML's management are responsible for the integrity of this information and individuals are provided with the necessary training to keep up to date with regulatory changes. The Company's financial statements are subject to an external audit by KPMG LLP on an annual basis, and controls are periodically reviewed by CGML's internal audit function. Other key information is prepared by the relevant internal function.

Principle 4 – Opportunity and Risk

Opportunity

Long-term strategic opportunities are identified in the CGML Strategic and Financial Plan process which is reviewed, discussed and challenged by the Board annually.

Risk

CGML's principal risk types arise from the nature of the services provided to its clients and include both financial and non-financial elements. The principal risk types identified by management and covered by CGML's Risk Management Framework are noted as follows:

- reputational risk;
- strategic risk;
- market risk;
- liquidity risk;
- credit risk (mainly in the form of counterparty credit risk);
- operational risk (including conduct risk); and
- compliance risk.

The Risk Committee ensures that the principal financial and non-financial risks and emerging risks are identified and managed appropriately and in a timely manner. The Committee meets at least quarterly and updates the risk register for any changes in underlying conditions. The Committee continues to refine and enhance the Company's Risk Management Framework and risk registers and works to ensure consistency across operations. The Risk Committee reports to the Board on a quarterly basis.

2. CGML Corporate Governance Report and Principal Risks (continued)

Principle 4 – Opportunity and Risk (continued)

Responsibilities

The Board and the Risk Committee are responsible for ensuring that senior management consider the external factors and dependencies on group-wide initiatives that may impact CGML's strategic opportunities. CGML's most valuable resource is its staff, so it closely monitors the impact of its strategy on the capability and resources availability within its talent pool. Risks are managed and mitigation plans designed and executed using CGML's detailed Risk Management Framework. The key external factors that the Board monitors are as follows:

- Geopolitical and economic factors that impact growth opportunities and financial returns. CGML took steps to minimise client and market disruption that might arise as a result of the conflict in Ukraine, supply chain impacts and rise in inflation;
- Rapid technological development that presents opportunities to improve client service but also creates the potential for industry wide change and exposes CGML to high impact risk (Cyber, IT resilience, Data Management). Operations & Technology have a critical role to ensure CGML is able to manage a significant pace of change to protect against negative disruption and to be operationally resilient; and
- The global and local regulatory environment, which requires governance and a strong compliance function to have oversight and collaboration with the first line and is capable of managing multiple priorities across a range of regulatory initiatives, including the timely completion of remediation and targeted improvements, addressing LIBOR transition, the finalisation of Basel III, Operational Resilience Third Party and inter affiliate outsourcing, Environmental, Social and Governance, and Climate Risks, amongst others.

Principle 5 – Remuneration

The Remuneration Committee aims to set remuneration at a level that will enable it to secure and retain executives who can deliver the Company's strategy.

The Remuneration Committee is responsible for making recommendations to the Board concerning the Company's remuneration strategy, recruitment framework and long-term incentive plans for senior executives. Pay is aligned with performance and taking into account fair pay and conditions across the Company's workforce.

The Company completed its sixth annual UK Gender Pay Gap Report based on 2022 remuneration. These Reports have highlighted areas which the Company can improve on and the Company is continuing to take steps to reduce the gender pay gap. Citi have signed the UK's Women in Finance Charter, and committed to a target to achieve at least 30% female representation among its director and managing director level staff throughout EMEA by 2025. As of the date of the 2022 Report, it was at 27.3%, up from 19% in 2017. The 2022 Gender Pay Report was published ahead of the UK Government's April 2022 deadline. This reflects continued progress in our gender pay gap figures as a result of women's increasing representation throughout the legal entity, particularly at senior levels.

In fulfilling its role, the Remuneration Committee has regard to the responsibilities set out under the PRA and FCA Remuneration Codes and takes into account, where applicable, relevant guidance and the long-term interests of shareholders, investors and other stakeholders in CGML.

Principle 6 – Stakeholders

As set out above in Principle 3, the Board is clear that progressive and effective governance is essential to deliver its purpose and to protect CGML and Citi's reputation and relationships with all its stakeholder community including clients, employees, shareholders, suppliers, regulators and the local communities in which it operates.

Details of our key stakeholders and our engagement with them are set out in our Section 172(1) Statement below and are incorporated into this statement.

As at 31 December 2022 CGML had 30 approved UK Senior Managers, of whom 4 were CGML Non-Executive Directors and 6 more CGML Executive Directors. CGML had 3 outgoing UK Senior Managers, subject to the final handover with the incoming UK Senior Manager.

2. CGML Corporate Governance Report and Principal Risks (continued)

Principle 6 – Stakeholder (continued)

Section 172(1) Statement

Section 172(1) of the Companies Act 2006 requires each Director of the Company to act in a way in which he/she considers, in good faith, would be most likely to promote the success of the Company for the benefit of its members as a whole, and in doing so have regard to a range of matters including:

- the likely consequences of any decision in the long-term;
- the interests of the Company's employees;
- the need to foster the Company's business relationships with suppliers, customers and others;
- the impact of the Company's operations on the community and the environment;
- the desirability of the Company maintaining a reputation for high standards of business conduct; and
- the need to act fairly as between the Company's members.

The Directors of the Company give careful consideration to the matters referred to in section 172(1) when discharging their legal duties. The Board believes in taking decisions for the long-term benefit of the Company and looks to safeguard the Company's reputation by upholding the highest standards of business conduct. Depending on the issue in question, the relevance of each stakeholder group and other relevant factors may vary. As such, the Board strives to understand the needs and priorities of each stakeholder group and the other factors relevant to the issue in question during its deliberations and as part of its decision-making.

Board members receive periodic refresher training on their legal duties and may seek advice about the implications of these duties at any time from our Company Secretary. New Directors are offered a comprehensive induction programme which includes information on their statutory duties.

To ensure the most efficient and effective approach, stakeholder engagement is led by Citi, in particular where matters are of group-wide significance or have an impact on Citi's reputation including our clients, shareholders, staff and global regulators.

The CGML Board considers and discusses information from across the organisation to help it understand the impact on CGML's operations and the interests and views of its key stakeholders. The Board also reviews strategic and financial performance as well as operational and financial risks and regulator priorities. The Board receives this information in advance of each quarterly meeting, during monthly calls with the CGML Chief Executive Officer and by holding an annual Strategy Day. The CGML Board receives regular reports from the Citigroup Chair, the Group Board Non-Executive Director and from the Citigroup EMEA Regional CEO at its Board meetings. The Group Board and the CGML Board spent time together during the Group Board visit to London in October 2022 to discuss a number of topics.

Using all of the above actions, the Board has an overview of engagement with stakeholders which enables the Directors to comply with their legal duty under section 172 of the Companies Act 2006.

<u>Key stakeholder engagement</u>

Clients

The CGML Board receives regular reporting of client performance and themes via the CEO Board report, allowing an understanding and oversight of the direction of client sentiment. Citi performs a Voice of the Client survey which provides in-depth understanding of our corporate clients' needs and expectations, alongside regular client performance and service benchmarking, leveraging external reporting and analysis where appropriate. The businesses within CGML operate a globally coordinated client-centric sales and relationship management organisation focussed on generating profitable and responsible growth and building market share with some of the most important organisations across the globe.

2. CGML Corporate Governance Report and Principal Risks (continued)

***Principle 6 – Stakeholder** (continued)*

Employees

CGML is aligned to Citi's mission of enabling growth and economic progress, while adhering to the highest ethical standards. Our culture is embedded through decisions that pass three tests: they are in our clients' interests, create economic value, and are always systemically responsible.

CGML's human capital strategies are designed to attract and retain the talent required to deliver the business strategy and support the health and wellbeing of employees and their families. During the COVID-19 pandemic and continuing into 2022, CGML took proactive measures to support colleagues' wellbeing, and implemented hybrid working through the How We Work programme. This programme is part of our Great Place to Work initiatives which attract and retain the best talent to serve our clients.

During 2022, CGML implemented Citi's enhanced performance management and executive compensation frameworks, policies, and procedures to improve employee accountability for risk and controls performance. A new framework for performance ratings was introduced with four pillars, including a risk and control measure for all employees.

CGML continues to focus on employee engagement and transparent communications. Colleagues are encouraged to share their suggestions and views to CGML through several channels, including an employee representative body, Ethics Office, and the Voice of the Employee Survey. The CGML Board receive regular updates and deep dives into culture, wellbeing, and resilience.

Suppliers

CGML works to maintain fair, resilient, well controlled and professional working relationships with its suppliers. CGML has a well-established framework for the engagement with and on-going relationship management and controls relating to risks of its key suppliers, ensuring shared values in the conduct of their business. The Modern Slavery Act 2015 ("the Act") obliges the CGML Board to make an annual statement on the reasonable steps taken to ensure that its own operations and supply chains are free of human trafficking and modern slavery. CGML has made annual statements of this nature since the Act came into force. The CGML Audit Committee reviews and challenges the due diligence which underpins the statement each year and seeks assurance from the second line of defence regarding the due diligence process. The Board is kept informed of any improvements made by Citigroup.

The information relating to the Modern Slavery Act, as required by the Modern Slavery Act 2015, will be published at https://www.citibank.co.uk/personal/home.do.

Regulators

CGML maintains an open and regular engagement with regulators to ensure clarity and transparency over its strategy and plan, key risks and opportunities, and progress on ongoing initiatives. Regulatory engagement is maintained both at the Board as well as the CGML and Group Management levels to ensure regulatory requirements and expectations are consistently understood and met. Primary regulatory engagement for CGML is with the PRA/ Bank of England and FCA supervisory teams and senior management, in addition to engaging with the CFTC and SEC internationally. Further, CGML is providing ongoing updates to the regulators on its clients, markets, employees, financials, liquidity, risk measures and operational/technology capabilities and resilience.

2. CGML Corporate Governance Report and Principal Risks (continued)

Principle 6 – Stakeholder (continued)

Communities

In pursuit of Citi's mission, CGML is committed to enabling responsible growth and progress in the communities where we operate. Citi is in regular dialogue with charities and non-governmental organisations (NGOs), as part of its philanthropic commitment and mission to support the communities in which it operates. Citi works closely with community partners to understand the issues local communities are facing so that it can respond appropriately by providing funding, volunteers or other support as required. Specifically, Citi has a focus on supporting disadvantaged young people into employment whether they are from less privileged backgrounds, refugees, young people affected by youth violence or young people with disabilities. The CGML workforce dedicate time through the annual Global Community Day and the London Charity Partner programme. Our previous partnership with Guide Dogs raised over £415,000, in addition to supporting other Citi charitable initiatives in the UK and overseas. Many of these are also supported financially by the Citi Foundation including Career Ready and Teach First. Engagement with local communities allows CGML to understand better the needs and requirements of society enabling it to innovate for the future and pursue its mission of enabling growth and progress.

Environment

Citi recognises the importance of its environmental responsibilities, monitors its impact on the environment, and seeks to mitigate environmental risks. Initiatives designed to minimise CGML's operational impact on the environment include safe disposal of waste, recycling and reducing energy consumption. The Board has been actively engaged regarding the implementation of the CGML response to the Prudential Regulation Authority's Supervisory Statement on Climate Change SS3/19 on managing the financial risks from climate change. CGML continues to make progress on embedding the entity's approaches to strengthening governance (via the CGML Risk Committee), incorporating climate change into risk management frameworks, conducting scenario analysis, and enhancing disclosures for climate change-related risks.

Government and Policymakers

CGML and Citi takes their responsibilities as a corporate citizen seriously, and pursues constructive engagement with regulators and policymakers to achieve better public policy solutions for issues such as climate change, which impacts our clients, employees and the communities where we operate in. For example in 2022 Citi contributed to the UK House of Commons Environmental Audit Select Committee's report on 'The financial sector and the UK's Net Zero transition' where we highlighted the importance of protecting energy security as energy systems decarbonise. Citi also submitted a comment letter in 2022 on the proposed principles for the risk management of climate-related financial risks issued by the Basel Committee on Banking Supervision (BCBS).

As part of Citi, CGML engages with policymakers both directly and as part of industry efforts, as a member of a number of financial services trade associations. As part of Citi, CGML complies with relevant transparency requirements, at both the European Union and various individual country level. Details of Citi's entry in the EU's Transparency Register can be found at: https://ec.europa.eu/transparencyregister/public/consultation/displaylobbyist.do?id=00353757573-57. Citi provides a summary of certain trade and business associations that it is a member of, and how Citi has engaged with them on climate-related issues on page 34 of its 2022 Taskforce on Climate-Related Financial Disclosures (TCFD) report which is available here: https://www.citigroup.com/rcs/citigpa/storage/public/taskforce-on-climate-related-financial-disclosures-report-2022.pdf.

Citi embraces a culture of openness and inclusivity. We incorporate the interests of a wide array of stakeholders into our business and believe this sharing of knowledge and resources can help us provide the best services and products for our clients and support the long-term resiliency of our business. We consistently hold ourselves accountable to our commitments and are transparent with our stakeholders about the progress we are making.

2. CGML Corporate Governance Report and Principal Risks (continued)

***Principle 6 – Stakeholder** (continued)*

Decision making in action

The Board's approach to stakeholder engagement is illustrated by the transition of the European Government Bond business from CGML to Citibank Europe plc as part of the target operating model planning following the UK's withdrawal from the EU. The Board received regular updates from the UK Executive Committee and working groups set up within the firm to oversee and manage the project. The Board provided challenge and oversight particularly concerning the risk and financial impact on CGML to ensure CGML remains a sustainable and profitable entity whilst enabling it to continue serving clients throughout the EEA with minimal disruption. The Board has continued to be actively engaged in target operating model planning throughout 2021 and into 2022.

3. Mission and Strategy

CGML's mission, in line with that of Citi, is to serve as a trusted partner to its clients by responsibly providing financial services that enable growth and economic progress. CGML's core activities are being a dealer, market maker and underwriter and providing advisory services. Whilst carrying out these activities, it ensures that actions are always in its clients' interests, create economic value and are systemically responsible.

The strategic priorities set out in CGML's 2022 - 2024 Strategic and Financial plan which was approved by the Board during the period are as follows:

- *Deliver client excellence as Citi's international broker-dealer.*

  CGML continues to maintain a strong client franchise and competitive position in the client segments, countries and products by capturing growth opportunities and through innovative electronic and digital offerings, despite volatile markets and geo-political uncertainties. CGML will continue to be one of Citigroup's four major global booking and risk management hubs, serving international clients from its registered headquarters in the UK or its international subsidiaries and branches.

- *Improve infrastructure to drive resilience, efficiency and a great client experience.*

  CGML continues to maintain focus on investment in core platforms and infrastructure to enhance client experience through delivery of electronic and digital execution capabilities, improve stability and operational resilience, improve data quality and data insights, simplification and automation of manual processes, and strengthening of cyber and third party risk management. CGML's priorities remain aligned to Citi's objectives and CGML will continue to benefit from enhancements to operational and technology infrastructure capabilities.

- *Make strong governance and controls a cornerstone of CGML's success.*

  CGML has taken positive steps to strengthen the design, operations and effectiveness of the legal entity governance, both at the Executive and the Board levels. CGML remains committed to demonstrate and embed continuous improvements in the control environment, and strong and decisive governance. Active identification and timely remediation of underlying issues, analysis of root causes, establishment of compensating or preventative controls, and broader application of improvements remain key areas of focus.

- *Attract, retain and develop talent and shape good culture and conduct.*

  CGML's priority is to be an employer of choice and to provide a great place to work. Commitment to Diversity and Inclusion is core to Citi's values. As part of Citi's pledge to the Women in Finance Charter, CGML has set a goal to increase the number of senior management roles held by women. These developments are further supported by wider diversity initiatives including measures to identify and retain high performing employees. CGML continues to focus on embedding a sustainable culture that encourages good conduct and high ethical and performance standards, and monitors positive momentum through the Voice of Employee survey results.

3. Mission and Strategy (continued)

- *Deliver sustained future profitability and efficient management of financial and capital resources.*

  CGML continues to focus on sustainable returns, improved financial resource efficiency, and effective forward-assessment and management of its financial, capital and liquidity resources to support growth opportunities, and to ensure that it maintains adequate capital and liquidity both in business-as-usual activities and managing periods of stress.

In addition to the above key priorities, CGML will continue to ensure that its capital strategy and financial resources provide a strong foundation for meeting its current actual requirements while supporting strategic growth.

Citi's consent order compliance

Citi has embarked on a multiyear transformation, with the target outcome to change its business and operating models such that they simultaneously strengthen risk and controls and improve Citi's value to customers, clients and shareholders. Citi continues to work constructively with the regulators and provides information regarding its plans and progress. Locally, CGML provides regular updates on the transformation to the UK and other regulators for their feedback and expectations on the impacts of the transformation on the firm. CGML will continue to reflect their feedback in its project plans and execution efforts.

4. Financial Highlights

Key Financial Performance Metrics

	2022	2021
Operating Efficiency *(operating expense as a percentage of gross profit)*	91.0%	88.1%
Return on Assets *(Net income as a proportion of total assets)*	0.05%	0.09%
Return on Tangible Common Equity (TCE) *(Net income as a proportion of TCE)*	1.2%	1.5%
Return on Tier 1 Capital *(Net income as a proportion of Tier 1 capital)*	1.0%	1.4%

The decrease in performance compared to 2021 was mainly as a result of an increase in expenses, driven by one off expenses incurred in 2022 in addition to higher compensation and benefits owing to an increase in headcount relating to increased resources in risk management and controls over the course of the year. While revenues grew in 2022, the Investment Banking sector saw a significant decline in the overall market against a backdrop of uncertainty surrounding the conflict in Ukraine, rising inflation, and subsequent monetary policies.

4.1 Income Statement Summary

	2022 $ Million	2021 $ Million
Commission income and fees	894	1,470
Net dealing income	3,253	2,834
Interest receivable	949	280
Interest payable	(1,472)	(1,087)
Gross profit	**3,624**	**3,497**
Operating expenses	(3,298)	(3,082)
Other income and expenses	17	19
Operating profit on ordinary activities before taxation	**343**	**434**
Tax on profits on ordinary activities	(65)	(31)
Profit after taxation for the financial year	**278**	**403**

4. Financial Highlights (continued)

Gross Profit

Gross profit increased by $127 million, a 4% increase on 2021. The increase was largely as a result of increased market activity across the Commodities and Rates businesses owing to increased client activity and mark to market gains across the energy sector, government bonds, and inflation linked securities as a result of the geopolitical situation in Europe and tighter monetary policy owing to rising inflation. This increase was partially offset by a decline in Investment Banking fee revenues owing to an overall decline in the market driven by the reasons outlined above.

Commission income and fees

Commission income and fees result from the BCMA business, from Equity Cash activity and from inter-company fees which are calculated on an arm's length basis. 2022 had a $(576) million decrease in commission income and fees mainly as a result of a decline in Investment Banking activity across the globe. In contrast to a strong performance in the market in 2021, where investors sought to take advantage of record low interest rates, 2022 saw a significant reduction in activity as a result of the rising inflation and tightening monetary policy.

Net Dealing Income

The foremost contributors to net dealing income were the Fixed Income and Equities businesses. Net dealing income rose by $419 million mainly on account of the increased market activity across Commodities and Rates as referenced above.

Interest Receivable and Payable

Interest receivable and payable mainly reflects income and expense from collateralised financing transactions measured at amortised cost. It also includes amounts paid relating to inter-company funding and subordinated debt. Interest receivable and payable increased significantly over the course of 2022 mainly on account of increasing interest rates.

Operating Expenses

Operating expenses were $3,298 million, an increase of $216 million compared to 2021, with the largest costs relating to compensation and benefits of $1,692 million (2021: $1,644 million). The increase in compensation and benefits was largely driven by increased headcount in CGML which increased by 682 over the course of the year. Additional increases in operating expenses included transactional expenses, technology and communication, provisions for liabilities, travel and entertainment, and intercompany service charges.

4.2 Balance Sheet

	31 December 2022 $ Million	31 December 2021 $ Million
Total Assets	521,792	451,281
Total Liabilities	493,072	422,762
Shareholders' funds	28,720	28,519

CGML's assets consist primarily of collateralised financing transactions, derivatives and trading inventory. Collateralised financing transactions include reverse repos and stock borrows; derivatives encompass interest rate, credit, equity and commodity derivatives; whilst bonds and equities form the largest categories of trading inventory. The Company's liabilities predominantly comprise collateralised financing transactions, derivatives and securities sold not yet purchased. The increase in assets and liabilities in 2022 was mainly driven by derivatives and associated collateral owing to significant market movements and increases in activity across the interest rate and commodity markets.

4. Financial Highlights (continued)

4.2 Balance Sheet (continued)

Shareholders' funds were $28,720 million (31 December 2021: $28,519 million) which represented an increase of $201 million. Movements in CGML's Shareholders' funds are mainly generated by total comprehensive income for the year, less coupon payments for Additional Tier 1 (AT1) Notes.

More detailed information about the composition of CGML's balance sheet, including analyses of its derivative and inventory holdings, can be found in the Balance Sheet and the Notes to the Accounts, in particular Note 15 'Financial assets and liabilities accounting classification and fair values', Note 14: 'Financial assets at fair value through profit or loss', and Note 13 'Derivatives'.

4.3 Regulatory Capital

CGML's regulatory capital position is summarised below.

	2022 $ Million	2021 $ Million
Capital resources		
Tier 1 capital	28,314	28,380
Tier 2 capital	2,600	2,600
Deductions	(3,566)	(3,037)
Total	**27,348**	**27,943**
Capital requirements (Pillar 1)		
Market risk	3,558	4,279
Credit risk	5,702	5,853
Operational risk	1,754	1,545
Large Exposures risk	424	336
Credit Valuation Adjustment (CVA) risk	456	379
Total	**11,894**	**12,392**
Excess capital over Pillar 1	**15,454**	**15,551**

Tier 1 capital encompasses tangible shareholders' funds. Tier 2 capital comprises long-term subordinated debt that is eligible for inclusion as capital. Deductions from capital include adjustments for the value of the defined benefit pension scheme, intangible assets and additional valuation adjustments.

Pillar 1 prescribes the minimum capital requirements for banks and investment firms under the Basel Capital Accord and the EU Capital Requirements Directive and Regulation. Following the UK's departure from the EU, the UK has on-shored certain parts of the Capital Requirements Regulation ("CRR II") and CRD V and has published rules to implement elements of CRR II in the UK which came into effect on 1 January 2022. In addition to Pillar 1 requirements, the PRA mandates a set of Pillar 2 regulatory capital standards which CGML is required to meet in its Individual Capital Guidance and certain additional capital buffers.

CGML remained in excess of its minimum regulatory capital requirements throughout the year, with management actively monitoring CGML's capital position on a daily basis.

4. Financial Highlights (continued)

4.4 External Environment

2022 saw a continued rebound in the UK Gross domestic product (GDP) of 4% as the economy continued its recovery from the impact of COVID-19 in 2020 where the UK GDP declined 11%, (+7.6% in 2021). The invasion of Russian forces into Ukraine in early 2022 saw significant strain on the supply of food and gas into Europe driving an increase in the Consumer Price Index (CPI), which was already impacted by the recovery from COVID-19. CPI rose to 10.5% by the end of 2022, up from 5.4% in December 2021, although down from its peak of 11.1% in October. Interest rates rose significantly over the course of 2022 as central banks aimed to combat rising inflation, with Bank of England base rates rising from 0.25% at the start of the year, to 3.5% in December. Furthermore, the third quarter saw significant volatility in UK Gilt prices following UK domestic political uncertainty and highly disruptive policy changes, requiring the Bank of England to intervene to restore market stability.

5. 2023 Future Outlook

The Company continues to monitor and respond to the evolving landscape in relation to COVID-19, elevated levels of inflation, higher interest rates and volatility in financial markets as a result of geo-political developments including continued responses to the invasion of Russian forces into Ukraine.

The Company has a stable business model that has proven its performance and resilience through the period of stress in the last two years and places it in a strong and sustainable position to benefit from opportunities for future growth. The Company plans to continue to grow its businesses offsetting the planned reduction in the European Government bonds portfolio over the coming years.

The external regulatory environment continues to evolve, notably for CGML this includes revisions to the Capital and Liquidity frameworks.

6. LIBOR Transition Risk

LIBOR has historically been used as the interest rate benchmark to price or value a wide range of financial products. The Company recognises that the ongoing transition away from and discontinuance of LIBOR presents various risks and challenges that could significantly impact financial markets and market participants. These include, among others, the pricing, liquidity, value of, return on and market for financial instruments and contracts that reference LIBOR or any other benchmark rate, including any alternative benchmark rate. Accordingly, Citi, and by extension the Company, has continued its efforts to identify and manage its LIBOR transition risks. Citi is also closely monitoring legislative, regulatory and other developments related to LIBOR transition matters and relief.

Citigroup established a LIBOR governance and implementation programme focused on identifying and addressing the LIBOR transition impacts to Citi's legal entities, clients, operational capabilities and legal and financial contracts, among others. The programme operates globally across Citi's businesses and functions. Citi also continued to engage with regulators, financial accounting bodies and others on LIBOR transition matters.

Moreover, the Company has continued to identify its LIBOR transition exposures, including financial instruments that do not contain contract provisions that adequately contemplate the discontinuance of reference rates and that require additional negotiation with counterparties. The Company's LIBOR transition efforts include, among other things, using alternative reference rates in certain newly issued financial instruments and products. Further, the Company has also been investing in its systems and infrastructure, as client activity moves away from LIBOR to alternative reference rates.

The LIBOR administrator ceased publication of non-USD LIBOR and one week and two-month USD LIBOR on a representative basis on 31 December 2021, with plans to cease publication of all other USD LIBOR tenors on 30 June 2023. As a result, Citi ceased entering into new contracts referencing USD LIBOR as of 1 January 2022, other than for limited circumstances where regulators recognized that it may be appropriate for banks to enter into new USD LIBOR contracts, including with respect to market-making, hedging or novations of USD transactions executed before 1 January 2022.

7. Climate Risk

Climate risk is the risk stemming from climate change either through physical risk (which refers to impact of changes in climate and weather) or through transition risk (which refers to risk arising from actions needed to mitigate the impacts of climate change by transitioning to a low-carbon economy). Citi's approach to climate-related risk is in Citi's Climate Risk Management Framework (CRMF). The CRMF details the governance, principles and requirements that promote the identification, measurement, monitoring, controlling, and reporting of climate-related risk. CRMF and CGML Risk Management Framework document define climate risk as a crosscutting risk which can manifest through or amplify existing risks within risk taxonomy.

Climate risk was recently designated as a "top risk" within Citi's Risk Governance Framework. Top risks are risks that have the potential to produce an impact large enough to threaten Citi's ability to maintain any of its core operations to serve its customers, Citi's earnings, liquidity, capital, operating model or risk profile. CGML's inherent climate-related transition risk is lower than a typical bank entity portfolio due to its credit and collateral exposures being short-term and subject to daily margin adjustments from strong credit counterparties.

Citi's Board of Directors has ultimate oversight of Citi's work to identify, assess and integrate climate-related risks and opportunities throughout the organisation. In addition to oversight by the full Board, the Nomination, Governance and Public Affairs Committee (NGPAC) of the Board and the Risk Management Committee (RMC) of the Board are the bodies primarily charged with oversight of our climate change efforts.

Board level oversight of climate risk matters impacting CGML is ensured by the CGML Board of Directors. Climate-related risk is included in the agendas of CGML Board meetings, including Risk and Audit Committees, as part of discussions relating to risk management frameworks, scenario analysis, Internal Capital Adequacy Assessment Process (ICAAP) risk assessment, new product approval trends and assurance activities. At the executive level in the UK, a dedicated UK Climate-Related Risk Working Group is in place with the primary objective to lead climate-related risk requirements for the UK legal entities.

Citi first established its Environmental and Social Risk Management (ESRM) Policy in 2003, as part of Citi's broader credit risk management policy, applicable to all Citi entities globally. The ESRM Policy provides the framework for how Citi identifies, mitigates, and manages the potential environmental and social risks (including climate risks) associated with clients' activities that could lead to credit or reputation risks to the firm. It guides how Citi evaluates lending, underwriting and advisory in environmentally sensitive and/or high-carbon sectors, and presents opportunities for Citi to engage clients on solutions to thematic risks.

In March 2021, Citi committed to net zero greenhouse gas (GHG) emissions by 2050, which includes net zero associated with our financing by 2050 and net zero for its own operations by 2030. As part of this commitment, Citi set 2030 targets to reduce financed emissions for loan portfolios in six key sectors. Targets and progress against them are detailed in the Citi's Taskforce on Climate-Related Financial Disclosure Report 2022. Citi has already taken significant steps to reduce its carbon footprint in the UK, such as installing solar panels on its UK data centre in 2021.

By order of the Board

J D K Bardrick
Director and Chief Executive Officer

25 April 2023

Incorporated in England and Wales
Registered office: Citigroup Centre, Canada Square, Canary Wharf, London E14 5LB
Registered Number: 01763297

CITIGROUP GLOBAL MARKETS LIMITED

DIRECTORS' REPORT

for the year ended 31 December 2022

The Directors present their Report and the audited financial statements of CGML for the year ended 31 December 2022.

Going concern basis

The financial statements are prepared on a going concern basis taking into account CGML's existing capital and liquidity resources. The Directors acknowledge the risk that extreme circumstances might adversely impact CGML's ability to continue trading and are satisfied that CGML has the resources to continue in business for the foreseeable future. In making this assessment, the Directors have considered a wide range of information relating to present and future conditions. As CGML is part of the Citigroup, the risks that apply to the parent also apply to all subsidiaries within the group including CGML. The risk factors impacting Citigroup Inc. are described in its 2022 annual report on form 10-K, which can be found at http://www.citigroup.com/citi/investor/sec.htm.

The Directors have reviewed the capital, liquidity and financial position of the Company including future capital, liquidity and financial plans covering a period of at least 12 months from the date of approval of these financial statements.

To assess any potential impact on the Company, the Directors reassessed the components of capital, liquidity and the financial position of the Company and have concluded that the going concern basis is still appropriate. The assessment was completed with reference to CGML's continued stress testing processes within under its Internal Capital Adequacy Assessment Process (ICAAP) and Internal Liquidity Adequacy Assessment Process (ILAAP).

CGML continues to monitor the key risks for its Liquidity and Capital position including the impact of the recent volatility in financial markets and the Company has shown that it would maintain sufficient Capital and Liquidity under plausible downside stress scenarios. The extent of the future impacts for CGML of events arising from such scenarios remains uncertain, but may include a continuation of higher inflation or interest rates and financial market volatility and the Company continues to consider as part of its ongoing evaluations.

Based on the above assessment, the Directors are confident that the Company will have sufficient funds to continue to meet its liabilities as they fall due for at least 12 months from the date of approval of the financial statements and therefore, have prepared the financial statements on a going concern basis. Further information relevant to this assessment is provided in the following sections of these financial statements:

- the principal activities, strategic direction and challenges and uncertainties are described in the Strategic Report on pages 1 to 16;
- a financial summary, including the income statement and statement of financial position, is provided in the financial results section on pages 27 to 31; and
- objectives, policies and processes for managing market, liquidity, credit and operational risk, and CGML's approach to capital management and allocation, are described in Note 29 'Financial instruments and risk management', starting on page 82.

In addition to the going concern basis, Citigroup Inc. continues to provide confirmation that it will provide sufficient funding to the Company to ensure that it maintains a sound financial situation and is in a position to meet its debt obligations for the foreseeable future.

Dividends

During the year CGML paid no dividends on its ordinary shares (2021: $nil).

CITIGROUP GLOBAL MARKETS LIMITED

DIRECTORS' REPORT

for the year ended 31 December 2022

Information included in the Strategic Report

CGML has elected to include information on financial risk management as per Schedule 7.6(1)(a) & (b) of the "Large and Medium-sized Companies and Groups Regulations 2008" in the Strategic Report as the Directors consider financial risk management to be of strategic importance to CGML. Further details about financial risk management are provided in Note 29 'Financial instruments and risk management.'

For the year ended 31 December 2022, the Company has applied the Wates Corporate Governance Principles for Large Private Companies (the Principles) (as published by the Financial Reporting Council in December 2018 and which are available on its website). Our corporate governance report, describing how CGML has applied the provisions of the Principles over the past year is presented in the Strategic Report in section 2. CGML Corporate Governance Report and Principal Risks, including employee engagement disclosure under the Section 172(1) Statement.

The Strategic Report also incorporates a discussion of likely future business developments, while important events affecting the Company since the end of the financial year are described in Note 34 'Events after the reporting period'. A summary of the Company's overseas branches and subsidiaries can be found in the Introduction to the Strategic Report.

Statement of directors' responsibilities in respect of the Strategic Report, the Directors' Report and the financial statements

The Directors are responsible for preparing the Annual Report, the Strategic Report, the Directors' Report and the financial statements in accordance with applicable law and regulations.

Company law requires the Directors to prepare financial statements for each financial year. Under that law, they have elected to prepare the financial statements in accordance with UK-adopted international accounting standards and applicable law.

Under company law the Directors must not approve the financial statements unless they are satisfied that they give a true and fair view of the state of affairs of the Company and of the profit or loss of the Company for that period. In preparing these financial statements, the Directors are required to:

- select suitable accounting policies and then apply them consistently;
- make judgements and estimates that are reasonable, relevant and reliable;
- state whether they have been prepared in accordance with UK-adopted international accounting standards;
- assess the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern; and
- use the going concern basis of accounting unless they either intend to liquidate the Company or to cease operations, or have no realistic alternative but to do so.

The Directors are responsible for keeping adequate accounting records that are sufficient to show and explain the Company's transactions and disclose with reasonable accuracy at any time the financial position of the Company and enable them to ensure that the financial statements comply with the Companies Act 2006. They are responsible for such internal control as they determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error, and have general responsibility for taking such steps as are reasonably open to them to safeguard the assets of the Company and to prevent and detect fraud and other irregularities.

The Directors are responsible for the maintenance and integrity of the corporate and financial information included on Citi's website. Legislation in the UK governing the preparation and dissemination of financial statements may differ from legislation in other jurisdictions.

CITIGROUP GLOBAL MARKETS LIMITED

DIRECTORS' REPORT

for the year ended 31 December 2022

Directors

The Directors who held office during the year ended 31 December 2022 and since year end were:

Non-Executive
S J Clark
W M N Fall
J P Moulds
D L Taylor (resigned on 26 April 2022)
P Henry (appointed 1 September 2022)
I Plunkett (appointed 4 October 2022)

Executive
L Arduini (resigned on 28 July 2022)
J D K Bardrick
D Jain
F M Mannion (resigned on 31 March 2022)
Z V Wimborne
A-M Tassell (resigned on 3 November 2022)
F Tobias Marin (appointed 3 August 2022)
A Raja (appointed 28 July 2022)
E Ducsai [subject for regulatory approval]

Directors' indemnity

Throughout the year and at the date of this report the Company is party to a group-wide indemnity policy which benefits all of its current Directors and is a qualifying third party indemnity provision for the purpose of section 236 of the Companies Act 2006.

Employment of disabled people

CGML is committed to a policy of recruitment and promotion on the basis of aptitude and ability without discrimination of any kind. Applications for employment by disabled persons are fully and fairly considered having regard to the aptitudes and abilities of each applicant. Efforts are made to enable any employees who become disabled during employment to continue their careers within CGML. Training, career development and promotion of disabled persons are, as far as possible, identical to those applicable to other employees who are not disabled.

Political contributions

The Company made no political contributions or incurred any political expenditure during the year (2021: $nil).

Sustainable Operations at CGML

CGML, as part of Citigroup Inc., has been measuring its environmental footprint for two decades and began reporting on its direct operational impacts in 2002. In 2021, Citi continued its progress to reduce its carbon footprint by continuing to use 100% renewable electricity across its facilities globally. In 2022 we announced to refurbish our EMEA HQ in Canary Wharf, London, by choosing to refurbish rather than move to a new build, will avoid over 100,000 tonnes of carbon being emitted. Updating infrastructure and implementing efficiency measures will also minimise electricity consumption and reduce water consumption by 20%. Other decisions such as reusing materials, a fully electric infrastructure and the installation of solar panels, will mean the building will emit zero carbon in normal operation and make the building consistent with Citi's commitment to reach Net Zero in its own operations by 2030. The project is targeting LEED, BREEAM and WELL certifications. We will continue to work to identify and implement opportunities to reduce our carbon footprint and in 2022 we undertook a detailed Net Zero audit of one of our Belfast offices, identifying opportunities to decarbonise the site.

Sustainable Operations at CGML (continued)

To build on its existing success and reduce its operational footprint further, Citi is committed to the following goals for increasing its energy efficiency and reducing GHG emissions by 2025, from a 2010 baseline:

- a 45% reduction in location-based GHG emissions (CO2e);
- a 40% reduction in energy consumption and maintain 100% renewable electricity sourcing; and
- certifying 40% of floor area to be LEED, WELL or equivalent standard, with a focus on Citi owned building to operate at the highest level of sustainability.

In addition to these 2025 reduction targets, in March 2021 Citi announced its commitment to net zero emissions for its global operations by 2030, which will include Scope 1 and 2 emissions. At this time, we're evaluating our emissions inventory among all Scope 3 categories to determine which are material and which we will have ability to influence. This exercise will determine the areas of our supply chain that will be included in our net zero operations emissions target.

Citi reports Scope 1, Scope 2 and Scope 3 Business Travel GHG emissions in both its Environmental Impact Report and its CDP response. Citi's global energy consumption and GHG emissions can be found in the annual Environmental, Social and Governance Report. Citi's GHG emissions and environmental data are verified and assured by SGS, a leading third-party inspection, verification, testing and certification company.

Streamlined Energy and Carbon Reporting

The following tables present CGML's estimated energy consumption, greenhouse gas emissions and chosen intensity metrics for its UK-based operations for the financial years 2020, 2021 and 2022 :

Energy Consumption	**2020**	**2021**	**2022**
Energy (MWh)	47,034	51,305	71,664

GHG Emissions

Scope	**Source**	**Unit**	**2020**	**2021**	**2022**
1	Direct	tCO2e	3,021	4,463	3,464
2	Indirect – Location-based	tCO2e	6,157	5,735	6,328
	Indirect – Market-based	tCO2e	—	—	—
3	Commercial air & rail travel	tCO2e	1,585	638	5,275
	Employee expensed car mileage	tCO2e	4	—	2
Total	**Scope 1, 2 (location) & Scope 3 Business Travel**	**tCO2e**	**10,768**	**10,837**	**15,069**
	Scope 1, 2 (market) & Scope 3 Business Travel	**tCO2e**	**4,610**	**5,102**	**8,741**

Intensity Ratio*	**2020**	**2021**	**2022**
tCO2e/Sq. Ft**	0.017	0.027	0.021
tCO2e/FTE	2.913	2.816	2.349

* these intensity metrics have been calculated using Scope 1 & 2 (location) emissions

** calculated using Citi's total Scope 1 & 2 carbon footprint from the group's UK portfolio

CGML's emissions are calculated in line with the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard (revised edition). The boundaries of the GHG inventory are defined using the operational control approach and cover the emissions the Company is responsible for across Scope 1, 2 and Scope 3 business travel. The emissions are calculated using the emissions factors for 2020, 2021 and 2022 published by the Department for Business, Energy & Industrial Strategy.

Sustainable Operations at Citigroup Global Markets Limited (continued)

Streamlined Energy and Carbon Reporting (continued)

Citi gathers data from its operations on an ongoing basis, with primary evidence sourced from office managers and technical team. Where Citi pay for occupancy via service charges and the share of consumption is not known, consumption is calculated by benchmarking the energy/square foot against our global portfolio. As multiple Citi-owned subsidiaries occupy the same office spaces and make use of data centres, the figures presented have been calculated using CGML's UK headcount pro-rata to the Citi UK headcount. Citi purchase 100% renewable electricity in the UK through green tariffs for electricity directly purchased. Where electricity is obtained in leased properties from landlords, guarantee of origin certificates are purchased for the equivalent amount used.

In 2022 there has been an increase in electricity consumption with the return-to-work post Covid-19 pandemic. Scope 3 travel has increased substantially also post the pandemic as Citi resumes a new business-as-usual standard.

Energy efficiency in action

The main sources of CGML's operations are from the running of data centres, offices and business travel of employees travelling for work. Whether undertaking new construction or renovating existing buildings, Citi prioritise efficiency and sustainability to minimise the environmental impact of its facilities. The below highlights the energy efficiency actions that were undertaken in 2022.

In the Citigroup Centre (CGC) 1 and Citigroup Centre (CGC) 2 buildings:

- CGC 1 chiller sequencing was recommissioned improving management of the site's current load;
- Reduction in Citi employees and tenants in CGC 2 has led to energy services being isolated; and
- Mothballed empty floors, isolating chilled water, tech rooms, variable air volume boxes and air compartment units.

In the Riverdale Data Centre:

- Computer Room Air Handler (CRAH) units have been upgraded/replaced with new units; and
- Installation of temperature monitoring in data halls which will allow a better control of the CRAH units.

In the Belfast Gateway office;

- Expansion of cycling facilities plus the inclusion of e-scooter charging points to promote zero-emitting alternative modes of transport; and
- Net zero carbon audit to identify a site decarbonisation plan in line with Citi's Net Zero pledge.

Events after the reporting period

The failures of US regional banks Silicon Valley Bank and Signature Bank, together with the government-sponsored acquisition of Credit Suisse by UBS, have resulted in increased financial market volatility and a revision of market expectations around future monetary policy. Some parts of the market have recovered relatively quickly and, in the near-term, the situation has broadly stabilised. Nevertheless, if further stresses or threats to confidence emerge in the banking sector or elsewhere in financial markets as a result of the tightening of monetary policy, market volatility would be expected to increase again.

At the date on which these financial statements were approved, there were no other significant events affecting the Company since the year end.

CITIGROUP GLOBAL MARKETS LIMITED

DIRECTORS' REPORT

for the year ended 31 December 2022

Disclosure of information to auditors

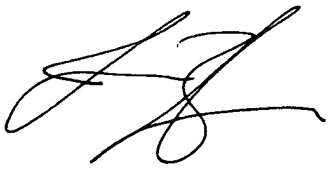
In accordance with section 418 of the Companies Act 2006 and subject to all the provisions of section 418, the Directors who held office at the date of approval of this Directors' Report confirm that:

- so far as each is aware, there is no relevant audit information of which the Company's Auditor is unaware; and
- each Director has taken all the steps that he/ she ought to have taken as a Director to make himself/ herself aware of any relevant audit information and to establish that the Company's Auditor is aware of that information.

Auditors

In accordance with Section 487 of the Companies Act 2006, the auditor will be deemed to be reappointed a KPMG LLP will therefore continue in office.

By order of the Board.



J D K Bardrick
Director and Chief Executive Officer

25 April 2023

Incorporated in England and Wales
Registered office: Citigroup Centre, Canada Square, Canary Wharf, London E14 5LB
Registered Number: 01763297

INDEPENDENT AUDITOR'S REPORT TO THE MEMBERS OF CITIGROUP GLOBAL MARKETS LIMITED

Opinion

We have audited the financial statements of Citigroup Global Markets Limited ("the Company") for the year ended 31 December 2022 which comprise the Income Statement, Statement of Comprehensive Income, Statement of Changes in Equity, Balance sheet, Statement of Cash Flows, and related notes, including the accounting policies in note 1.

In our opinion the financial statements:

- give a true and fair view of the state of the Company's affairs as at 31 December 2022 and of its profit for the year then ended;
- have been properly prepared in accordance with UK-adopted international accounting standards; and
- have been prepared in accordance with the requirements of the Companies Act 2006.

Additional opinion in relation to EU-adopted IFRS

As explained in note 1 to the financial statements, the Company, in addition to complying with its legal obligation to apply UK-adopted international accounting standards, has also applied International Financial Reporting Standards adopted pursuant to Regulation (EC) No 1606/2002 as it applies in the European Union ("EU-adopted IFRS").

In our opinion the financial statements have been properly prepared in accordance with EU-adopted IFRS.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) ("ISAs (UK)") and applicable law. Our responsibilities are described below. We have fulfilled our ethical responsibilities under, and are independent of the Company in accordance with, UK ethical requirements including the FRC Ethical Standard as applied to other entities of public interest. We believe that the audit evidence we have obtained is a sufficient and appropriate basis for our opinion.

Going concern

The Directors have prepared the financial statements on the going concern basis as they do not intend to liquidate the Company or to cease its operations, and as they have concluded that the Company's financial position means that this is realistic. They have also concluded that there are no material uncertainties that could have cast significant doubt over its ability to continue as a going concern for at least a year from the date of approval of the financial statements ("the going concern period").

We used our knowledge of the Company, its industry, and the general economic environment to identify the inherent risks to its business model and analysed how those risks might affect the Company's financial resources or ability to continue operations over the going concern period. The risks that we considered most likely to adversely affect the Company's available financial resources over this period were:

- the availability of funding and liquidity in the event of market wide and idiosyncratic stresses;
- the impact on regulatory capital requirements in the event of an increase in financial instrument price volatility or risk due to market-wide stress; and
- the impact of the geopolitical tensions due to market-wide stress.

We considered whether these risks could plausibly affect the liquidity in the going concern period by assessing the directors' sensitivities over the level of available financial resources indicated by the Company's financial forecasts taking account of severe, but plausible adverse effects that could arise from these risks individually and collectively.

Our procedures also included:

- Critically assessing assumptions in severe, but plausible scenarios relevant to liquidity and capital. We have also assessed whether forecasts of the income statement and balance sheet are internally consistent and are consistent with our knowledge of the entity and the sector in which it operates.

- We evaluated the achievability of the actions the Directors consider they would take to improve the position should the risks materialise, taking into account the extent to which the Directors can control the timing and outcome of these.

We considered whether the going concern disclosure in note 1(a) to the financial statements gives a full and accurate description of the Directors' assessment of going concern, including the identified risks and dependencies.

Our conclusions based on this work:

- we consider that the Directors' use of the going concern basis of accounting in the preparation of the financial statements is appropriate;
- we have not identified, and concur with the Directors' assessment that there is not, a material uncertainty related to events or conditions that, individually or collectively, may cast significant doubt on the Company's ability to continue as a going concern for the going concern period.

However, as we cannot predict all future events or conditions and as subsequent events may result in outcomes that are inconsistent with judgements that were reasonable at the time they were made, the above conclusions are not a guarantee that the Company will continue in operation.

Fraud and breaches of laws and regulations – ability to detect

Identifying and responding to risks of material misstatement due to fraud

To identify risks of material misstatement due to fraud ("fraud risks") we assessed events or conditions that could indicate an incentive or pressure to commit fraud or provide an opportunity to commit fraud. Our risk assessment procedures included:

- Enquiring of Directors, the Audit Committee, Internal Audit and inspection of policy documentation as to the Company's high-level policies and procedures to prevent and detect fraud, including the internal audit function, and the Company's channel for "whistleblowing", as well as whether they have knowledge of any actual, suspected or alleged fraud.
- Reading Board, Audit Committee and Risk Committee minutes.
- Using analytical procedures to identify any unusual or unexpected relationships.
- Using our own forensic specialists to assist us in identifying fraud risks associated with journals.

We communicated identified fraud risks throughout the audit team and remained alert to any indications of fraud throughout the audit.

As required by auditing standards, and taking into account our overall knowledge of the control environment, we perform procedures to address the risk of management override of controls, in particular the risk that the Company's management may be in a position to make inappropriate accounting entries and the risk of bias in accounting estimates and judgements such as hard to price financial instruments. On this audit we do not believe there is a fraud risk related to revenue recognition because income is automatically calculated by IT applications and there is no manual intervention which limits the opportunity for management to commit fraud through the manipulation of revenue.

We also identified a fraud risk related to existence and accuracy of unconfirmed derivatives and valuation of hard to price financial instruments in response to possible pressures to meet profit targets.

In determining the audit procedures we took into account the results of our evaluation and testing of the operating effectiveness of some of the Company-wide fraud risk management controls

We performed procedures including:

- Identifying journal entries and other profit and loss adjustments based on risk criteria and comparing the identified entries to supporting documentation. These included those posted by senior finance management, those posted and approved by the same user and those posted to unusual accounts.
- Assessing significant accounting estimates relating to valuation of hard to price financial instrument for bias.

- Incorporating an element of unpredictability in the selection of the nature, timing and extent of audit procedures to be performed, including:
  - increasing the extent of substantive procedures performed on significant accounts
  - selecting items for testing that have lower amounts or are otherwise outside customary selection parameters

Identifying and responding to risks of material misstatement related to compliance with laws and regulations

We identified areas of laws and regulations that could reasonably be expected to have a material effect on the financial statements from our general commercial and sector experience, through discussion with the directors (as required by auditing standards), inspection of the Company's regulatory and legal correspondence and discussed with the directors the policies and procedures regarding compliance with laws and regulations.

As the Company is regulated, our assessment of risks involved gaining an understanding of the control environment including the entity's procedures for complying with regulatory requirements.

We communicated identified laws and regulations throughout our team and remained alert to any indications of non-compliance throughout the audit.

The potential effect of these laws and regulations on the financial statements varies considerably.

Firstly, the Company is subject to laws and regulations that directly affect the financial statements including financial reporting legislation (including related companies legislation), distributable profits legislation and taxation legislation and we assessed the extent of compliance with these laws and regulations as part of our procedures on the related financial statement items.

Secondly, the Company is subject to many other laws and regulations where the consequences of non-compliance could have a material effect on amounts or disclosures in the financial statements, for instance through the imposition of fines or litigation or the loss of the Company's license to operate. We identified the following areas as those most likely to have such an effect: regulatory capital and liquidity, money laundering, sanctions lists and financial crime, market abuse regulations, conduct issues, certain aspects of company legislation recognising the financial and regulated nature of the Company's activities. Auditing standards limit the required audit procedures to identify non-compliance with these laws and regulations to enquiry of the Directors and other management and inspection of regulatory and legal correspondence, if any. Therefore, if a breach of operational regulations is not disclosed to us or evident from relevant correspondence, an audit will not detect that breach.

Context of the ability of the audit to detect fraud or breaches of law or regulation

Owing to the inherent limitations of an audit, there is an unavoidable risk that we may not have detected some material misstatements in the financial statements, even though we have properly planned and performed our audit in accordance with auditing standards. For example, the further removed non-compliance with laws and regulations is from the events and transactions reflected in the financial statements, the less likely the inherently limited procedures required by auditing standards would identify it.

In addition, as with any audit, there remained a higher risk of non-detection of fraud, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal controls. Our audit procedures are designed to detect material misstatement. We are not responsible for preventing non-compliance or fraud and cannot be expected to detect non-compliance with all laws and regulations.

Strategic report and Directors' report

The Directors are responsible for the Strategic report and the Directors' report. Our opinion on the financial statements does not cover those reports and we do not express an audit opinion thereon.

Our responsibility is to read the Strategic report and the Directors' report and, in doing so, consider whether, based on our financial statements audit work, the information therein is materially misstated or inconsistent with the financial statements or our audit knowledge. Based solely on that work:

- we have not identified material misstatements in the Strategic report and the Directors' report;
- in our opinion the information given in those reports for the financial year is consistent with the financial statements; and
- in our opinion those reports have been prepared in accordance with the Companies Act 2006.

Matters on which we are required to report by exception

Under the Companies Act 2006, we are required to report to you if, in our opinion:

- adequate accounting records have not been kept, or returns adequate for our audit have not been received from branches not visited by us; or
- the financial statements are not in agreement with the accounting records and returns; or
- certain disclosures of Directors' remuneration specified by law are not made; or
- we have not received all the information and explanations we require for our audit.

We have nothing to report in these respects.

Directors' responsibilities

As explained more fully in their statement set out on page 18, the Directors are responsible for: the preparation of the financial statements and for being satisfied that they give a true and fair view; such internal control as they determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error; assessing the Company'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 they either intend to liquidate the Company or to cease operations, or have no realistic alternative but to do so.

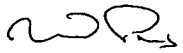
Auditor's responsibilities

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 our opinion in an auditor's report. Reasonable assurance is a high level of assurance, but does not guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

A fuller description of our responsibilities is provided on the FRC's website at www.frc.org.uk/auditorsresponsibilities.

The purpose of our audit work and to whom we owe our responsibilities

This report is made solely to the Company's members, as a body, in accordance with Chapter 3 of Part 16 of the Companies Act 2006 and the terms of our engagement by the Company. Our audit work has been undertaken so that we might state to the Company's members those matters we are required to state to them in an auditor's report, and the further matters we are required to state to them in accordance with the terms agreed with the Company, and for no other purpose. To the fullest extent permitted by law, we do not accept or assume responsibility to anyone other than the Company and the Company's members as a body, for our audit work, for this report, or for the opinions we have formed.



Richard Pinks (Senior Statutory Auditor)
for and on behalf of KPMG LLP, Statutory Auditor
Chartered Accountants
15 Canada Square
London E14 5GL
25 April 2023

CITIGROUP GLOBAL MARKETS LIMITED

INCOME STATEMENT

for the year ended 31 December 2022

	Notes	2022 $ Million	2021 $ Million
Commission income and fees	4	894	1,470
Net dealing income	6	3,253	2,834
Interest receivable	5	949	280
Interest payable	5	(1,472)	(1,087)
Gross profit		3,624	3,497
Operating expenses	7	(3,298)	(3,082)
Impairment of investments in subsidiary	20	—	—
Net finance income on pension	8	10	7
Other income		7	12
Operating profit on ordinary activities before taxation		343	434
Tax on profits on ordinary activities	11	(65)	(31)
Profit after taxation for the financial year		278	403

The accompanying notes on pages 32 to 106 form an integral part of these financial statements.

CITIGROUP GLOBAL MARKETS LIMITED

STATEMENT OF COMPREHENSIVE INCOME

for the year ended 31 December 2022

	Notes	2022 $ Million	2021 $ Million
Profit after taxation for the financial year		278	403
Other Comprehensive Income			
Items that will not be reclassified subsequently to profit or loss:			
Gross (losses)/gains on remeasurement of defined benefit pension asset	8	(195)	99
Deferred tax benefit/(charge) associated with remeasurement of pension asset	8	53	(27)
Deferred tax charge associated with rate change on remeasurement of pension asset	8	29	(31)
Gains on debt valuation adjustment (DVA) attributed to the change in credit risk		342	21
Deferred tax charge associated with loss on DVA		(92)	(6)
Deferred tax (charge)/benefit associated with rate change on DVA		(13)	11
Total other comprehensive income		124	67
Total comprehensive gain for the financial year		402	470

The net movement in the Statement of Comprehensive Income in respect of the pension scheme reflects changes in the actual and expected returns on scheme assets and liabilities and the related tax impact associated with the balance sheet valuation of the defined pension asset.

The accompanying notes on pages 32 to 106 form an integral part of these financial statements.

CITIGROUP GLOBAL MARKETS LIMITED

STATEMENT OF CHANGES IN EQUITY

for the year ended 31 December 2022

	Notes	Share Capital $ Million	Other equity instruments $ Million	Capital reserve $ Million	Equity reserve $ Million	Retained earnings $ Million	Total $ Million
At 1 January 2021		**1,500**	**2,300**	**12,999**	**1,264**	**2,704**	**20,767**
Profit after taxation for the year						403	403
Gross gains on remeasurement of defined benefit pension asset	**8**	—	—	—	—	99	99
Deferred tax loss associated with remeasurement of pension asset		—	—	—	—	(27)	(27)
Deferred tax loss associated with rate change on remeasurement of pension asset		—	—	—	—	(31)	(31)
Gain on debt valuation adjustment (DVA)		—	—	—	—	21	21
Tax loss associated with gains on DVA		—	—	—	—	(6)	(6)
Tax benefit associated with rate change on DVA		—	—	—	—	11	11
Total comprehensive expense		—	—	—	—	67	67
Share based payment transactions	**9**	—	—	—	(3)	—	(3)
Capital contribution	**28**	—	—	5,500	—	—	5,500
Conversion of Capital reserve into Share capital	**28**	18,499	—	(18,499)	—	—	—
Other equity instruments issued	**28**	—	2,000	—	—	—	2,000
Dividend on other equity instruments		—	—	—	—	(195)	(195)
Loss on debt valuation adjustment (DVA) disposal		—	—	—	—	(28)	(28)
Tax benefit associated with loss on DVA disposal		—	—	—	—	8	8
At 31 December 2021		**19,999**	**4,300**	**—**	**1,261**	**2,959**	**28,519**
Profit after taxation for the year		—	—	—	—	278	278
Gross losses on remeasurement of defined benefit pension asset	**8**	—	—	—	—	(195)	(195)
Deferred tax benefit associated with remeasurement of pension asset		—	—	—	—	53	53
Deferred tax loss associated with rate change on remeasurement of pension asset		—	—	—	—	29	29
Gain on debt valuation adjustment (DVA)		—	—	—	—	342	342
Tax loss associated with gains on DVA		—	—	—	—	(92)	(92)
Tax loss associated with rate change on DVA		—	—	—	—	(13)	(13)
Total comprehensive income		—	—	—	—	124	124
Share based payment transactions	**9**	—	—	—	85	—	85
Deferred tax benefit/(loss) associated with share based payment transactions		—	—	—	(23)	—	(23)
Dividend on other equity instruments		—	—	—	—	(263)	(263)
Loss on debt valuation adjustment (DVA) disposal		—	—	—	—	—	—
Tax benefit associated with loss on DVA disposal		—	—	—	—	—	—
At 31 December 2022		**19,999**	**4,300**	**—**	**1,323**	**3,098**	**28,720**

The other equity instruments relate to Additional Tier 1 notes. Further information is included in Note 28 'Capital and reserves'. The capital reserve includes capital contributions from the parent company, which are distributable. The equity reserve includes the fair value movement of the share based incentives issued, and other fair value movements captured in equity.

The accompanying notes on pages 32 to 106 form an integral part of these financial statements.

CITIGROUP GLOBAL MARKETS LIMITED

BALANCE SHEET

for the year ended 31 December 2022

	Notes	31 December 2022 $ Million	31 December 2021 $ Million
Assets			
Financial assets at amortised cost			
– cash at bank	12	7,076	8,463
– collateralised financing transactions	15	91,817	76,862
Financial assets mandatorily at fair value through profit or loss			
– derivatives	13	197,965	157,281
– inventory	14	57,500	64,751
– equity securities held for investment	16	122	106
Financial assets designated at fair value through profit or loss	13	80,372	81,701
Investments in subsidiary and related undertakings	20	4,330	3,830
Pension asset	8	305	547
Other assets	18	82,305	57,740
Total Assets		**521,792**	**451,281**
Liabilities and Equity			
Financial liabilities at amortised cost			
– bank loans and overdrafts	15	10,644	7,201
– collateralised financing transactions	15	62,240	63,067
Financial liabilities mandatorily at fair value through profit or loss			
– derivatives	13	198,725	161,797
– securities sold but not yet purchased	15	52,347	65,997
Financial liabilities designated at fair value through profit or loss	15	78,434	69,388
Other liabilities	23	79,582	46,712
Subordinated loans	27	11,100	8,600
Total Liabilities		**493,072**	**422,762**
Capital and reserves			
Called up share capital	28	19,999	19,999
Other equity instruments	28	4,300	4,300
Capital reserve	28	—	—
Retained earnings and other reserves		4,421	4,220
Shareholders' funds		**28,720**	**28,519**
Total Liabilities and Shareholders' Funds		**521,792**	**451,281**

The accompanying notes on pages 32 to 106 form an integral part of these financial statements.

The financial statements on pages 27 to 106 were approved by the Directors on 25 April 2023 and were signed on their behalf by:

J D K Bardrick
Director and Chief Executive Officer
Registered Number: 01763297

CITIGROUP GLOBAL MARKETS LIMITED

STATEMENT OF CASH FLOWS

for the year ended 31 December 2022

	Notes	2022 $ Million	2021 $ Million
Cash flows from operating activities:			
Profit before taxation		343	434
Adjustments for:			
Depreciation and amortisation	7	56	53
Provision charged and other movements during the year	24	47	(5)
(Income)/expense related to Pension	8	195	(99)
Net impairment charge/(release) on investment securities	20	—	—
Net impairment loss on loans and advances	7	13	6
Net loss/(gain) on other fair value items	16	(16)	(7)
Other non-cash movements including exchange rate movements		(6)	11
Net interest income	5	523	807
		1,155	1,200
Changes in:			
Financial assets at amortised cost		(14,968)	(4)
Financial assets mandatorily at fair value through profit or loss		(33,432)	65,639
Financial assets designated at fair value through profit or loss		1,329	(4,397)
Other assets		(24,013)	(5,809)
Financial liabilities at amortised cost		2,964	(14,416)
Financial liabilities mandatorily at fair value through profit or loss		23,277	(58,293)
Financial liabilities designated at fair value through profit or loss		9,046	5,524
Other liabilities		32,409	5,700
		(2,233)	(4,856)
Interest received		423	4,443
Interest paid		(814)	(1,444)
Income taxes paid		(65)	(125)
Net cash used in operating activities		**(2,689)**	**(1,982)**
Cash flows from investing activities			
Dividends received from investments		13	8
Acquisition of investment securities	20	(500)	(1,705)
Acquisition of intangible assets	19	(99)	(83)
Net cash used in investing activities		**(586)**	**(1,780)**
Cash flows from financing activities			
Issue of Additional Tier 1 capital	28	—	2,000
Capital contribution received from parent	28	—	5,500
Proceeds from issue of subordinated liabilities	27	2,500	(2,000)
Dividends paid on other equity instruments		(263)	(195)
Net cash from financing activities		**2,237**	**5,305**
Net increase in cash and cash equivalents		(1,038)	1,543
Cash at bank including bank overdrafts at 1 January		6,970	5,427
Cash at bank including bank overdrafts at 31 December		**5,932**	**6,970**

Under IAS 7, Bank overdrafts which are repayable on demand and which form an integral part of an entity's cash management are also included as a component of cash and cash equivalents in the Statement of Cash Flows.

CITIGROUP GLOBAL MARKETS LIMITED

NOTES TO THE FINANCIAL STATEMENTS

1. Principal accounting policies

(a) Basis of presentation

The financial statements of the Company have been prepared in accordance with UK-adopted international accounting standards, and International Financial Reporting Standards adopted pursuant to Regulation (EC) No 1606/2002 as it applies in the European Union ("EU-adopted IFRS"). The financial statements have been prepared on a going concern basis and, in accordance with the Companies Act 2006 as applicable to CGML.

The financial statements have been prepared in US Dollars, which is the functional and presentational currency of the Company, and any reference to $ in these financial statements refers to US Dollars. The Company has rounded figures to the nearest million $, unless otherwise stated.

As permitted under section 401 of the Companies Act 2006, consolidated financial statements have not been prepared because the Company is a wholly owned subsidiary of the ultimate parent, Citigroup Inc., which prepares consolidated financial statements under United States Generally Accepted Accounting Principles (US GAAP). The Company meets the criteria for exemption from the obligation to prepare and deliver group accounts that is available to a company included in non-European Economic Area (EEA) group accounts of a larger group. These financial statements therefore present information about the Company as an individual undertaking and not about its group. Citigroup Inc. makes its financial statements available to the public on a quarterly basis.

As was reported in the ultimate parent company's (Citigroup's) Annual Report on SEC Form 10-K for the year ended 31 December 2022, various geopolitical and macroeconomic challenges and uncertainties continue to adversely impact economic conditions in the U.S. and globally. The U.S. and other countries have continued to experience significantly elevated levels of inflation, resulting in central banks implementing a series of interest rates increases, with additional increases expected in the near term. In addition to causing a humanitarian crisis, the war in Ukraine continues to disrupt energy and food markets. An economic rebound in China remains uncertain, due to the ongoing impacts from COVID-19, the amount of leverage in its economy and stress in the property sector. These and other factors have adversely affected financial markets, negatively impacted global economic growth rates, contributed to lower consumer confidence and increased the risk of recession in Europe, the U.S. and other countries. These and other factors could adversely affect Citi's customers, clients, businesses, funding costs, expenses and results during 2023.

To assess any potential impact on the Company, the Directors reassessed the components of capital, liquidity and the financial position of the Company and have concluded that the going concern basis is still appropriate. The reassessment was completed with reference to the stress testing processes within the ICAAP and ILAAP which demonstrated that CGML has sufficient capital and liquidity buffers to withstand the current market conditions. In this reassessment, the Directors considered severe but plausible downside scenarios, including stress tests aligned to the ICAAP for which the Company uses an internal model. The stress scenarios are considered to be at least as severe as the Bank of England's Scenario for banks and building societies not part of concurrent stress testing scenario. This analysis indicated that the Company would maintain capital and liquidity headroom throughout the period covered by the forecasts, even in plausible downside scenarios.

The Directors are confident that the Company will have sufficient funds to continue to meet its liabilities as they fall due for at least 12 months from the date of approval of the financial statements and therefore, have prepared the financial statements on a going concern basis. In addition, Citigroup Inc. continues to provide confirmation that it will provide sufficient funding to the Company to ensure that it maintains a sound financial situation and is in a position to meet its debt obligations for the foreseeable future.

1. Principal accounting policies (continued)

(b) Changes in accounting policy and disclosures

The accounting policies adopted are consistent within the accounts and with those of the previous financial year, except for certain amendments and improvements to the IFRS standards implemented as at 1 January 2022, which did not have a material impact on the Company unless otherwise noted below. There were no other material or amended standards or interpretations that resulted in a change in accounting policy for the year ended 31 December 2022.

Standards and amendments issued and effective from 1 January 2022

There are a number of accounting standards that have been amended by the International Accounting Standards Board ("IASB"), which became effective from 1 January 2022. They include:

- Onerous Contracts – Cost of Fulfilling a Contract (Amendments to IAS 37)
- Annual Improvements to IFRS Standards 2018-2020;
- Property, Plant and Equipment: Proceeds before Intended Use (Amendments to IAS 16);
- Reference to the Conceptual Framework (Amendments to IFRS 3).

The above amendments did not have material impact on the Company's financial statements..

Standards and amendments issued but not yet effective as at 31 December 2022

The accounting standards and amendments set out below have been issued by the IASB, but are not yet effective for the Company. The Company does not plan on early adoption of these standards. These standards either have no impact or not expected to have material impact to the Company upon adoption.

- IFRS 17 Insurance Contracts;
- Initial Application of IFRS 17 and IFRS 9 – Comparative Information (Amendments to IFRS 17) ;
- Classification of Liabilities as Current or Non-current (Amendments to IAS 1) (not yet endorsed by the EU);
- Sale or Contribution of Assets between an Investor and its Associate or Joint Venture (Amendments to IFRS 10 and IAS 28) (not yet endorsed);
- Disclosure of Accounting Policies (Amendments to IAS 1 and IFRS Practice Statement 2);
- Definition of Accounting Estimates (Amendments to IAS 8);
- Deferred Tax related to Assets and Liabilities arising from a Single Transaction (Amendments to IAS 12).

(c) Financial instruments

Classification and measurement

From a classification and measurement perspective, IFRS 9 requires all financial assets, except equity instruments and derivatives, to be assessed based on a combination of the entity's business model for managing the assets and the instruments' contractual cash flow characteristics (whether the contractual cash flows are solely payments of principal and interest (SPPI)). For SPPI, 'principal' is defined as the fair value of the financial asset on initial recognition and 'interest' is defined as consideration for the time value of money and the credit risk associated with the principal amount outstanding during a period of time. Interest can also include consideration for other basic lending risks (for example, liquidity risk) and costs (for example, administrative costs) associated with holding the financial asset for a particular period of time and a profit margin that is consistent with a basic lending arrangement.

1. **Principal accounting policies** (continued)

(c) **Financial instruments** (continued)

Categories under IFRS 9: fair value through profit or loss (FVTPL), fair value through other comprehensive income (FVOCI), and amortised cost. IFRS 9 also allows entities to irrevocably designate financial assets that qualify for amortised cost or FVOCI instruments as FVTPL, if doing so eliminates or significantly reduces a measurement or recognition inconsistency (an accounting mismatch). This election is referred to as the Fair Value Option (FVO). The majority of the financial instruments of the Company are measured at fair value through profit or loss. The Company has no financial instruments categorized as FVOCI.

Financial liabilities which do not meet the definition of trading liabilities can be designated at FVTPL using the FVO, if one of the following criteria are met: (1) the designation eliminates or significantly reduces a measurement or recognition inconsistency (accounting mismatch); (2) a group of financial liabilities is managed and its performance is evaluated on a fair value basis in accordance with a documented risk management or investment strategy; or (3) the instrument contains one or more embedded derivatives which are not bifurcated. Financial liabilities which are designated at FVTPL, under the FVO, include collateralised financing transactions and hybrid financial liabilities.

Further, movements on gains or losses arising from an entity's own credit risk relating to liabilities designated at FVTPL are presented in other comprehensive income (OCI) with no subsequent reclassification to the income statement.

The financial assets held at amortised cost meet the SPPI test and are held to collect contractual cash flows.

FVTPL

Where the asset is not held within a business model whose objective is to hold to collect the contractual cash flows or within a business model whose objective is to both collect the cash flows and to sell the assets, then the asset will be classified as FVTPL. Moreover, any instrument for which the contractual cash flow characteristics do not comprise solely payments of principal and interest (that is, they fail the SPPI test) must be classified in the FVTPL category.

Financial assets and liabilities held for trading

Financial instruments that have been acquired principally for the purpose of selling or repurchasing in the near term, or form part of a portfolio of financial instruments that are managed at fair value together and for which there is evidence of short term profit taking are classified as "held for trading". Financial assets classified as "held for trading" include collateralised financing transactions, government bonds, non-government bonds, equities and derivatives. Financial liabilities classified as "held for trading" include derivatives, hybrid financial liabilities and short sales (securities sold but not yet purchased). A short sale is a sale of securities that the seller does not own at the time of sale. A short sale must be covered through the delivery of the securities sold short or a due bill, which is a promise to deliver specific securities to a customer later.

Trading assets and liabilities are initially recognised at fair value on settlement date and subsequently re-measured at fair value. Any changes in fair value between trade date and settlement date are reported in the income statement. Gains and losses realised on disposal or redemption and unrealised gains and losses from changes in fair value (including any foreign currency retranslation gains and losses) are reported in the income statement. Any initial gain or loss on financial instruments where valuation is dependent on valuation techniques using unobservable parameters are deferred over the life of the contract or until the instrument is redeemed, transferred or sold or the fair value becomes observable.

Derivatives and Hybrid financial instruments

Derivative contracts used in trading activities are recognised at fair value on the date the derivative is entered into and are subsequently re-measured at fair value. All derivatives are carried as assets when fair value is positive and as liabilities when fair value is negative. Gains and losses realised on disposal or redemption and unrealised gains and losses from changes in fair value are reported in the income statement.

1. **Principal accounting policies** (continued)

(c) **Financial instruments** (continued)

Where an embedded derivative exists within a financial liability host contract, the host contract and embedded derivative are measured as a package under the fair value option.

Equity securities held for investment

Strategic investments including investments in exchanges, clearing houses and settlement houses are required to be held at fair value through the profit or loss account.

Other financial liabilities and subordinated loans

Financial liabilities and subordinated loans are measured at amortised cost using the effective interest rate, except those which are "held for trading", which are held at fair value through the profit or loss account.

Amortised Cost

A financial asset debt instrument shall be classified and subsequently measured at amortised cost (unless designated under FVO) only if both of the following conditions are met:

a) Business Model test: the financial asset debt instrument is held under a business model whose objective is to hold assets in order to collect contractual cash flows; and
b) SPPI test.

Loans and receivables

Loans and receivables incorporate trade debtors, including settlement receivables, and are initially recognised at fair value including direct and incremental transaction costs and subsequently measured at amortised cost using the effective interest rate method, and subject to expected credit loss impairment under IFRS 9.

Repurchase and resale agreements and securities lending/borrowing

Repurchase and resale agreements are treated as collateralised financing transactions and measured at amortised cost. Securities which have been sold with an agreement to repurchase continue to be shown on the balance sheet and the sale proceeds are recorded as a collateralised financing transaction within other liabilities. Securities acquired in purchase and resale transactions are not recognised on the balance sheet and the purchase is recorded as a collateralised financing transaction within other assets. The difference between the sale price and the repurchase price is recognised over the life of the transaction and is charged or credited to the income statement as interest payable or receivable.

Similarly, when securities are lent or borrowed in exchange for cash, this is also treated as collateralised financing. Securities lent are not derecognised from the balance sheet and the cash inflow is recognised as a collateralised borrowing. Securities borrowed are not recognised on the balance sheet and the cash inflow is recognised as a collateralised lending. The securities lending fees payable and receivable are charged or credited to the income statement as interest payable or receivable. However, the Company measures a portion of its repurchase and resale agreements at fair value. Financial instruments are measured at fair value through profit or loss when they meet one or more of the criteria set out below:

- the assets or liabilities are managed, evaluated and reported internally on a fair value basis.
- the designation eliminates or significantly reduces an accounting mismatch that would otherwise arise.

That portion of the Company's repurchase and resale agreements which are hedged with instruments measured at fair value and managed as a combined business strategy have been designated as fair value through profit or loss.

1. **Principal accounting policies** (continued)

(c) **Financial instruments** (continued)

Determination of fair value

Where the classification of a financial instrument requires it to be stated at fair value, this is determined by reference to the quoted market value in an active market wherever possible. Where no such active market exists for the particular instrument, the Company uses a valuation technique to arrive at the fair value, including the use of prices obtained in recent arms' length transactions, discounted cash flow analysis, option pricing models and other valuation techniques commonly used by market participants. In case the transaction price in the market in which these transactions are undertaken is different from the fair value in the Company's principal market for those instruments, the fair value of these transactions are also estimated by using valuation techniques. See Note 15 'Financial assets and liabilities accounting classifications and fair values' for further details.

Collateral

The Company receives collateral from customers as part of its business activities. Collateral can take the form of cash, securities or other assets. Where cash collateral is received this is recorded on the balance sheet and, where required by collateral agreements, is reported as restricted cash. The Company does not recognise non-cash collateral received on its balance sheet.

Where cash collateral is posted to a third party, the Company derecognises cash from its balance sheet. Non-cash collateral posted to a third party remains on the Company's balance sheet.

Offsetting financial instruments

Financial assets and liabilities are offset and the net amount reported in the balance sheet only when there is currently a legally enforceable right to offset the recognised amounts and there is an intention to settle on a net basis or realise the asset and settle the liability simultaneously. The legal right to set off the recognised amounts must be enforceable in both the normal course of business, in the event of default, insolvency or bankruptcy of both the Company and its counterparty. In all other situations they are presented gross.

All offsetting applied by the Company relates to derivatives and repurchase and reverse repurchase agreements. A significant portion of offsetting is applied to interest rate derivatives and related cash margin balances, which are cleared through central clearing parties such as the London Clearing House. The Company also offsets repurchase and reverse repurchase agreements for which the Company has the right to set off and has the intent to settle on a net basis or to realise an asset and settle a liability simultaneously.

Derecognition of financial assets and financial liabilities

Financial assets are derecognised when the right to receive cash flows from the assets has expired or when the Company has transferred its contractual right to receive the cash flows of the financial assets and either substantially all the risks and rewards of ownership have been transferred or substantially all the risks and rewards have neither been retained nor transferred but control is not retained.

If the Company enters into a transaction that results in it retaining significantly all of the risks and rewards of a financial asset it will continue to recognise that financial asset and will recognise a financial liability equal to the consideration received under the transaction. Financial liabilities are derecognised when they are extinguished, that is when the obligation is substantially modified, exchanged, discharged, cancelled or expired.

Impairment

The IFRS 9 impairment standard applies to any debt instruments measured at amortised cost or at fair value through other comprehensive income and also to off balance sheet loan commitments and financial guarantees. The standard requires an estimation of an expected credit loss (ECL) that is unbiased and probability weighted, including information about past events, current conditions and reasonable and supportable forecasts of future events and economic conditions at the reporting date. The estimate will also consider the time value of money.

1. **Principal accounting policies** (continued)

(c) **Financial instruments** (continued)

ECL will be measured on each reporting date according to a three-Stage expected credit loss impairment model under which each financial asset is classified in one of the stages below:

- Stage 1 – From initial recognition of a financial asset to the date on which the asset has experienced a significant increase in credit risk relative to its initial recognition, a loss allowance is recognized equal to the credit losses expected to result from defaults expected over the next 12 months. Interest is calculated based on the gross carrying amount of the asset.
- Stage 2 – Following a significant increase in credit risk relative to the risk at initial recognition of the financial asset, a loss allowance is recognized equal to the full credit losses expected over the remaining life of the asset. Interest is calculated based on the gross carrying amount of the asset.

  The credit losses for financial assets in Stage 1 and Stage 2 are measured as the present value of all cash shortfalls (i.e. the difference between the cash flows due to the entity in accordance with the contract and the cash flows that the Company expects to receive).
- Stage 3 – When a financial asset is considered to be credit-impaired, a loss allowance equal to the full lifetime expected credit losses will be recognized. Credit losses are measured as the difference between the gross carrying amount and the present value of estimated future cash flows. Interest revenue is calculated based on the carrying amount of the asset, net of the loss allowance, rather than on its gross carrying amount.

Evidence that a financial asset is impaired includes observable data that comes to the attention of the Company such as:

- Significant financial difficulty of the issuer or obligor;
- A breach of contract, such as a default or delinquency in interest or principal payments;
- It becomes probable that the borrower will enter bankruptcy or other financial reorganisation;
- The disappearance of an active market for that financial asset because of financial difficulties; or
- Observable data indicating that there is a measurable decrease in the estimated future cash flows from a portfolio of financial assets since the initial recognition of those assets, although the decrease cannot yet be identified with the individual financial assets in the portfolio, including:
  - adverse changes in the payment status of borrowers in the portfolio; and
  - national or local economic conditions that correlate with defaults on the assets in the portfolio.

Staging

Financial assets can move in both directions through the stages of the IFRS 9 impairment model depending on the assessment of whether there is a significant increase of credit risk since initial recognition or whether the asset is credit impaired subsequently changes.

In order to determine the ECL reporting stage for an obligation, the Company determines whether the asset is already impaired (Stage 3) or not (Stage 1 and 2). Stage 2 is determined by the existence of a significant credit deterioration (or credit improvement) compared with the credit rating at initial recognition. Stage 1 assets do not have significant credit deterioration compared with that at initial recognition. All newly acquired or originated financial assets that are not purchased or originated credit impaired (POCI) are recognised in Stage 1 initially.

Additional qualitative reviews are also performed to assess the staging results and make adjustments, as necessary, to better reflect the positions which have significantly increased in risk.

Changes in the required credit loss allowance, including the impact of movements between Stage 1 and Stage 2, are recorded in the income statement as an adjustment to the allowance for credit losses.

1. **Principal accounting policies** (continued)

(c) Financial instruments (continued)

Because of the nature of business activities and the financial assets on the Company's balance sheet (high credit quality reverse repo asset loans and short term trade receivables), the recognition of expected credit losses has a minimal impact. For the vast majority of its exposures, the Company has taken advantage of practical expedients allowed by IFRS 9 in which either: (a) lifetime expected credit losses are recognised irrespective of changes in credit risk (applicable to receivables such as trade date or brokerage receivables), or (b) twelve-month expected credit losses are recognised where credit risk is low at the reporting date (applicable to reverse repos and securities borrowed).

(d) Commodities

Commodities are initially recognised under inventory at fair value on settlement date and subsequently re-measured at fair value less costs to sell. Realised gains and losses on sales of commodities inventory are included in net dealing income.

(e) Fee and commission income

The primary components of fee and commission income are investment banking fees and brokerage commissions.

Fee and commission income is recognised when the right to consideration has been obtained in exchange for performance.

Investment banking fees are substantially composed of underwriting and advisory revenues. Such fees are recognised at the point in time when Company's performance under the terms of a contractual arrangement is completed, which is typically at the closing of a transaction. Reimbursed expenses related to these transactions are recorded as revenue and are included within investment banking fees.

Brokerage commissions primarily include commissions and fees from the following: executing transactions for clients on exchanges and over-the-counter markets; sales of mutual funds and other annuity products; and assisting clients in clearing transactions, providing brokerage services and other such activities. Brokerage commissions are recognised at the point in time the associated service is fulfilled, generally on trade-execution date.

The services described above are generally provided by the Company in a principal capacity, whereby it has primary responsibility for fulfilling the contract with the customer.

(f) Interest receivable and payable and the effective interest method

Interest income and expense is recognised in the income statement for all financial assets classified as loans and receivables and non-trading financial liabilities, using the effective interest rate method. The Effective Interest Rate (EIR) is the rate that exactly discounts the estimated future cash payments and receipts through the expected life of the financial asset or financial liability to the carrying amount of the financial asset or financial liability. The calculation of the effective interest rate includes incremental and directly attributable transaction costs and fees paid or received that are an integral part of the effective interest rate. When calculating the EIR, the Company estimates future cash flows considering all contracted terms of the financial instrument, but no future credit losses. For assets which are initially recognized as purchased or credit impaired, interest revenue is calculated through the use of a credit-adjusted effective interest rate which takes into consideration expected credit losses. A credit-adjusted EIR is the interest rate that exactly discounts estimated future cash payments or receipts through the expected life of the financial asset to the amortised cost of a financial asset that is a purchased or originated credit-impaired financial asset.

Interest arising on financial assets or financial liabilities that are "held for trading" or "designated at fair value" is reported within net dealing income.

1. **Principal accounting policies** (continued)

(g) Net dealing income

Net dealing income comprises gains and losses related to trading assets, trading liabilities and financial assets and liabilities designated at fair value and commodities, and includes all realised and unrealised fair value changes, dividends and foreign exchange differences. For derivatives that are not part of hedging programmes, both the interest element and the fair value movements are recognised as part of net dealing income.

(h) Tangible and Intangible assets

Tangible fixed assets are measured at cost, less accumulated depreciation. The cost of developed software includes directly attributable internal costs and the cost of external consultants. Depreciation is provided at rates calculated to write-off the cost, less the estimated residual value of each asset, on a straight line basis over its expected economic useful life, as follows:

Premises improvements	–	lesser of the life of the lease or 10 years
Equipment	–	lesser of the life of the equipment or 10 years
Capitalised software	–	2 to 10 years

At each reporting date the Company assesses whether there is any indication that tangible or intangible fixed assets are impaired.

(i) Investments in subsidiaries

Investments in subsidiary undertakings are stated at cost less impairment. The Company determines whether it is necessary to recognise an impairment loss on its investment in shares in subsidiary undertakings by comparing the carrying value of the investment with the value in use, determined by the net asset value of the subsidiary undertaking at the reporting date.

(j) Taxation

Income tax payable on profits is recognised as an expense based on the applicable tax laws in each jurisdiction in the period in which profits arise.

Deferred tax assets and liabilities are recognised for taxable and deductible temporary differences between the tax bases of assets and liabilities and their carrying amounts in the financial statements. Deferred tax assets are recognised to the extent that it is probable that there will be sufficient profits available against which these differences can be utilised.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply in the period in which the asset will be realised or the liability will be settled based on tax rates that are enacted or substantively enacted at the balance sheet date. Deferred tax balances are not discounted.

1. **Principal accounting policies** (continued)

(k) Pension and other post retirement benefit costs

CGML operates both a defined benefit and a defined contribution pension scheme.

The cost of CGML's defined contribution pension scheme is expensed as the related service is provided and recognised within operating expenses in the income statement. The defined benefit obligation is calculated annually by independent actuaries using the projected unit credit method. The present value of the defined benefit obligation is determined by discounting the estimated future cash outflows using interest rates of high quality corporate bonds that are denominated in the currency in which the benefits will be paid and that have terms to maturity approximating to the term of the related pension liability. Remeasurement gains and losses are recognised immediately in the Statement of Other Comprehensive Income (OCI). The current service cost and any past service costs are included in the income statement within operating expenses. The interest income on pension scheme assets, net of the impact of the interest cost on the pension scheme liabilities, is included within Net finance income on pension.

A surplus is recognised on the balance sheet where an economic benefit is available as a reduction in future contributions or as a refund of monies to Citi.

(l) Foreign currencies

Transactions in foreign currencies are recorded using the rate of exchange at the date of transaction. Monetary assets and liabilities denominated in currencies other than US Dollars are translated into US Dollars using the year end spot exchange rates. Non-monetary assets and liabilities denominated in currencies other than US Dollar that are classified as "held for trading" or "designated at fair value" are translated into US Dollars using the year end spot rate. Non-monetary assets and liabilities denominated in currencies other than US Dollars that are not measured at fair value have been translated at the relevant historical exchange rates. Any gains or losses on exchange are taken to the income statement as incurred.

(m) Share-based incentive plans

The Company participates in a number of Citi equity settled share-based incentive plans under which Citigroup grants shares to its employees in exchange for services from employees. Pursuant to a separate Stock Plans Affiliate Participation Agreement (SPAPA), the Company makes a cash settlement to Citigroup for the fair value of the share-based incentive awards delivered to the employees under these plans.

The Company applies equity-settled accounting for its share based incentive plans, with separate accounting for its associated obligations to make payments to Citigroup Inc as part of a recharge arrangement. The Company recognises the fair value of the awards at grant date with a credit to the intercompany payable (recharge liability) to Citigroup Inc. All amounts paid to Citigroup Inc. and the associated obligations are recognised over the vesting period as compensation expense. Subsequent changes in the fair value of the recharge liability in respect of all unexercised awards are reviewed annually and any changes in value are recognised in the equity reserve, again over the vesting period. The SPAPA is also updated annually. The total expense is recognised over the vesting period, which is the period over which all of the specified vesting conditions are to be satisfied.

1. **Principal accounting policies** (continued)

(m) Share-based incentive plans (continued)

For Citi's share based incentive plans that have a graded vested period each "tranche" of the award is treated as a separate award. Where a plan has a cliff vest, the award only has a single "tranche". The expense is recognised as follows:

Vesting Period of Award	% of expense recognised in Income Statement						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
2 Years (vesting in 2 Tranches)	75%	25%					
3 Years (vesting in 3 Tranches)	61%	28%	11%				
4 Years (vesting in 4 Tranches)	52%	27%	15%	6%			
5 Years (vesting in 5 Tranches)	46%	26%	16%	9%	4%		
7 Years (vesting in 4 Tranches)	19%	19%	19%	19%	13%	8%	4%

However, employees who meet certain age plus years of service requirements (retirement eligible employees) may terminate active employment and continue vesting in their awards provided they comply with specified non-compete provisions. The cost of share based incentive plans are recognised over the requisite service period. For awards granted to retiree eligible employees, the services are provided prior to grant date, and subsequently the costs are accrued in the year prior to the grant date.

EU Short Term awards are a form of Capital Accumulation Programme (CAP) awarded to qualifying staff. The award is accounted for similarly to CAP awards but is delivered in the form of immediately vested restricted shares subject to a six month sale restriction.

(n) Cash at bank

Cash and balances at central banks or other financial institutions comprise balances with original maturity of less than three months and are carried at amortised cost on the Company's balance sheet.

(o) Provisions

Provisions are recognised for present obligations arising as consequences of past events where it is more likely than not that a transfer of economic benefit will be necessary to settle the obligation, which can be reliably estimated. Provisions are measured at the best estimate of the outflow of resources that will be required to settle the obligation.

(p) Modification of financial liabilities

When a financial liability is modified, or there is an exchange of debt instruments between the same lender and borrower, the original financial liability is derecognised—and a new liability recognised—if the two debt instruments have 'substantially different' terms. This determination considers both a quantitative comparison of the debt's cash flows before and after the modification, as well as consideration of qualitative factors such as risk profile, maturity, or existence of embedded derivatives.

Where terms are substantially different, the existing liability is derecognised, and any difference between the carrying value and the value of the replacement debt is recognized in profit or loss at the date of modification.

When the contractual cash flows of a financial liability are renegotiated or otherwise modified and the renegotiation or modification does not result in the derecognition of that financial liability in accordance with IFRS 9, the Company shall recalculate the gross carrying amount of the financial liability, and any difference is also recognized in profit or loss at the date of modification.

2. Use of assumptions, estimates and judgements

The results of the Company are sensitive to the accounting policies, assumptions and estimates that underlie the preparation of its financial statements. The accounting policies used in the preparation of the financial statements are described in detail above.

The preparation of financial statements requires management to make judgements, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimate is revised and in any future periods affected.

Valuation of financial instruments and credit valuation adjustments are sources of estimation uncertainties that require management to make highly complex or subjective judgements, which have (or may have) the most significant effect on the amounts recognized in the financial statements. The Company's accounting policy for valuation of financial instruments is described in Note 1(c) with further information disclosed in Note 15.

During 2022, the Company recorded net CVA gain of $111 million (2021: $52 million gain). There were additionally net FVA gain of $3 million (2021: $32 million losses). The total adjustment recorded in the balance sheet at the year-end was $(97) million (2021: $(57) million).

The valuation of the defined benefit obligation in respect of the CGML PLAS Pension Plan is dependent on key actuarial assumptions, including discount rates, inflation rate - retail price index ('RPI'), pay increase and mortality assumptions. Any change to these assumptions can significantly impact the measurement of the defined benefit pension obligation. Thus, measurement of the defined benefit obligation inherently includes a high degree of estimation uncertainty.

Below is a summary of the main financial and demographic assumptions adopted for the PLAS Pension Plan.

% per annum	2022	2021
Discount rate	5	2
Inflation rate (RPI)	3	4
Inflation rate (CPI)	3	3

The discount rate assumption for 2022 was based on a standard AON GBP Single Agency AA curve. The RPI inflation assumption for 2022 was set by reference to the Bank of England's implied inflation curve. No allowance is made for inflation risk premium. The methodology used to derive the discount rate and inflation assumptions is consistent with that used in the previous year.

The post-retirement mortality or demographic assumptions take into consideration the PLAS Pension Plan post-retirement mortality experience and recent evidence from published mortality surveys. An allowance has been made for future mortality improvements based on the 2021 core projection model published by the Continuous Mortality Investigation Bureau subject to a long-term trend of 1.25% per annum in future improvements (2021: 1.5% per annum). There are no considerations for the long-term impact of COVID-19 on the mortality assumptions as COVID-19 is deemed to have a knock-on effect. The table below shows the assumed life expectancy at 65 for members of the PLAS Pension Plan:

Life expectancy:	2022	2021
Male currently aged 65	24	24
Female currently aged 65	25	25

3. Turnover and results

As permitted by paragraph 4 of Schedule 1 to the Companies Act 2006 The Large and Medium-sized Companies and Groups (Accounts and Reports) Regulations 2008 (SI 2008 No 410), the format of the income statement and the Balance sheet have been adapted to the circumstances of the Company. Instead of turnover, the Directors have reported fee and commission income, net dealing income and interest receivable less interest payable in determining the gross profit of the Company.

4. Fee and commission income

	2022 $ Million	2021 $ Million
Investment Banking		
Advisory Fees	235	357
Underwriting Fees	349	630
Other Investment Banking Fee	(44)	69
	540	1,056
Brokerage commissions and fees	230	294
Other revenue	124	120
Total fee and commission income	894	1,470
Of which, revenue from contracts with customers	*747*	*1,179*

Revenue from contracts with customers

	2022 $ Million	2021 $ Million
Investment Banking		
Advisory Fees	163	238
Underwriting Fees	349	630
Other Investment Banking Fee	(5)	9
	507	877
Brokerage commissions and fees	237	299
Other revenue	3	3
Total revenue from contracts with customers	747	1,179

Included within Other assets are contract assets amounted to $91 million (2021: $47 million) and included within Other liabilities are contract liabilities amounted to $85 million (2021: $109 million).

5. Interest income and interest expense

	2022 $ Million	2021 $ Million
Interest income comprises:		
Interest on collateralised financing transactions, debtors and cash assets measured at amortised cost	949	280
	949	280
Interest expense comprises:		
Interest on collateralised financing transactions and borrowings measured at amortised cost	904	866
Interest on subordinated debt	568	221
	1,472	1,087

Interest income and expense is recognised in the income statement for all financial assets classified as loans and receivables and non-trading financial liabilities, using the effective interest rate method.

Included within interest receivable is interest received on client money. Interest receivable and payable increased significantly in 2022, in line with the market in which the Company operates, thus effecting Citi's cost of funding as well.

6. Net dealing income

	2022 $ Million	2021 $ Million
Net dealing income mandatorily at fair value through profit and loss	3,018	2,742
Net dealing income designated at fair value through profit or loss	235	92
	3,253	2,834

The financial liabilities designated at fair value through profit or loss are fully collateralised (see Note 29 'Financial instruments and risk management') such that there are no changes in the fair value of these liabilities attributable to changes in their credit risk.

7. Operating expenses

	2022 $ Million	2021 $ Million
Compensation and benefits expenses:		
Fixed		
Salaries	756	724
Payroll taxes	195	198
Benefits	32	(8)
Deferred cash	101	117
Share-based incentive expense (Note 9)	152	159
Pension costs		
– defined benefit scheme (Note 8)	7	12
– defined contribution scheme	64	57
Medical expenses	38	36
Severance	22	16
Variable		
Discretionary incentive compensation	234	242
Share-based incentive expense (Note 9)	60	66
Agency & temporary staffing	30	24
Other business specific variable compensation	1	1
Total compensation and benefits expenses	1,692	1,644
Transactional expenses	394	366
Technology/Communications	188	170
Consumption charges	242	253
Tax charges	95	174
Other operating expenses	687	475
Total operating expenses	**3,298**	**3,082**
Other operating expenses include:		
Depreciation (Note 19)	56	53
IFRS 9 reserve	13	6
Fees payable to the company's auditor for the audit of the company's annual accounts:		
In support of the Citigroup Inc global audit	3.31	3.08
Audit of these financial statements	1.66	1.54
Fees payable to the company's auditor and its associates for other services:		
Audit related assurance services	1.80	1.82
Other assurance services	0.05	0.20

Consumption charges include service fees for the provision of realty services, software and technology costs mainly from other Citi affiliates.

The Company employed an average of 4,226 (2021: 3,604) employees during the year.

The following table shows an analysis of the monthly average number of direct employees of the Company:

	2022	2021
Institutional Clients Group	**3,736**	**3,163**
Global Rates	957	127
Global Spread Products	114	123
Equity Markets & Securities Services	471	1,125
Commodities	68	71
Banking, Capital Markets and Advisory	747	641
Business Support	1,379	1,076
Infrastructure Operations and Global Functions	**490**	**441**

8. Pension

Defined benefit and contribution schemes

The Citigroup (UK) Pension Plan was established in September 2000 and provides defined contribution benefits to all new hires. The contributions that Citi is required to make are known, although the pension benefit will vary depending upon the investment returns achieved by investment choices made by the employee.

The Citigroup Global Markets Limited Pension and Life Assurance Scheme ("the Scheme") is a funded pension scheme providing benefits on both a defined benefit and defined contribution basis. The defined benefit arrangements are generally non-contributory and based on accrual of 1/60th of final pensionable salary for each year of pensionable service in the Scheme. The defined contribution arrangement provides age-related employer contributions ranging from 6% to 13% of pensionable salary for those aged 20 and 55 respectively, increasing by 1% for each 5 year age band. Additionally, employee contributions are matched up to a maximum of 3% at a rate of £1:£1 for those over age 45 and 50p:£1 for those under age 45. The Scheme also provides lump sum death benefits to active members, based on a multiple of salary, which the members can select. The Scheme is now closed to new entrants. The Scheme operates under trust law and is managed and administered by CG Pension Trustees Limited (the Trustee) on behalf of the members in accordance with the terms of the Trust Deed and Rules and relevant legislation. The Plan's assets are held by the trust. Employees are not required to contribute to the Scheme, which is contracted out of the State Earnings Related Pension Scheme.

Cash contributions to the Scheme are reviewed every three years as part of an actuarial valuation. Following each actuarial valuation, the Company agrees what contributions are required to fund ongoing benefit accrual and agrees a deficit recovery plan with the Trustee Board if necessary. The most recent actuarial funding valuation of the Scheme at 5 April 2020 revealed a surplus of £47.9 million so no recovery plan was required. The Company agreed that it would pay £7.24 million per annum from 1 June 2018 to 31 July 2021 and £6.3 million per annum from 1 August 2021 onwards to cover the cost of ongoing benefit accrual. Payments to the Scheme will continue in line with the Schedule of Contributions until a new funding agreement is reached with the Trustees as part of the triennial valuation process. From 1 June 2018, it was also agreed that the Scheme's investment management expenses would be met from Scheme assets.

The pension cost in respect of defined benefit obligations is assessed in accordance with the advice of a qualified external actuary using a Projected Unit method with a triennial review. The most recent full actuarial assessment of the liabilities of the scheme was at 5 April 2020.

The Scheme exposes Citi to a number of risks, the most significant being;

- Asset Volatility - the Scheme's obligations are calculated using a discount rate set with reference to corporate bond yields; if assets underperform this yield, this will create a deficit.
- Bond Yields - a decrease in corporate bond yields will increase the value placed on the Scheme's obligations for accounting purposes. Provided that government bond yields decrease by the same margin as corporate bond yields, this will largely be offset by an increase in the value of the Scheme's assets.
- Inflation Risk - a significant proportion of the Scheme's obligations are linked to inflation such that higher inflation will lead to higher liabilities (although in most cases, caps on the level of inflationary increases are in place to protect against extreme inflation).
- Life Expectancy - the majority of the Scheme's obligations are to provide benefits for the life of the member, so increases in life expectancy will result in an increase in the liabilities.

Expected regular employer contributions to be paid into the Scheme during 2022 are $8 million (2021: $10 million).

The Scheme duration is an indicator of the weighted-average time until benefit payments are made. For the Scheme as a whole, the duration is 15 years.

The mortality assumptions are based on standard mortality tables which allow for expected future mortality improvements. The assumptions are that a member currently aged 65 will live on average for a further 23.6 years for males and 25.0 years for females. Members currently aged 45 are expected to live a further 24.7 years and 26.3 years from age 65 for males and females respectively.

8. Pension (continued)

Assumptions that are affected by economic conditions (financial assumptions) are based on market expectations at the balance sheet date, for the period over which the obligations are settled.

The financial assumptions used in calculating the defined benefit scheme liabilities as at 31 December 2022 are as follows:

	2022	2021
Discount rate for scheme liabilities	4.75%	1.95%
Interest income rate on scheme assets	4.75%	1.95%
Inflation - RPI	3.40%	3.50%
Inflation - CPI	2.90%	3.00%
Rate of general long-term increase in salaries	2.90%	1.50%
Rate of increase to pensions in payment		
– Pensions accrued from 1 May 2005	2.40%	2.50%
– Pensions accrued prior to 1 May 2005	3.10%	3.20%

Following a public consultation, in November 2020, the government confirmed that it would accept the UK Statistics Authority's proposal that the Retail Price Index (RPI) should be aligned with the Consumer Price Index (including housing costs) (CPIH) from 2030.

The fair value of Scheme assets, which includes offsetting Liability Driven Investments ("LDIs") at the reporting date are set out as follows:

	Fair value	
	2022 $ Million	2021 $ Million
Listed assets		
Government bonds	1,096	2,070
Other	7	15
Unlisted assets		
Government bonds	(387)	(747)
Corporate bonds	450	734
Insured Pensions	1	1
Total market value of assets	1,167	2,073

Analysis of amounts recognised in the income statement account:

	2022 $ Million	2021 $ Million
Current service cost	5	7
Past service cost	—	3
Administrative Expenses	2	2
Expense recognised in the profit and loss account	7	12

8. **Pension** (continued)

Analysis of other finance income:

	2022 $ Million	2021 $ Million
Interest income on pension scheme assets	37	31
Interest expense on pension scheme liabilities	(27)	(24)
Net finance income on pension	**10**	**7**

Analysis of amount recognised in Statement of Comprehensive Income:

	2022 $ Million	2021 $ Million
Return on scheme assets below of that recognised in net interest income	(681)	(5)
Actuarial gains due to changes in financial assumptions	530	85
Actuarial gains due to changes in demographic assumptions	—	1
Actuarial (losses)/gains due to liability experience	(44)	18
Total remeasurement (losses)/gains recognised in Statement of Comprehensive Income	(195)	99
Deferred tax adjustment on pension in Statement of Comprehensive Income	53	(27)
Deferred tax charge associated with rate change on remeasurement of pension asset	29	(31)
Total (losses)/gains recognised in Statement of Comprehensive Income net of tax	**(113)**	**41**

Changes in the pension scheme liabilities or assets that do not arise from regular pension cost, net interest on net defined benefit liabilities or assets, past service costs, settlements or contributions to the scheme, are remeasurements - such remeasurements are recognised in other comprehensive income. Remeasurements comprise experience adjustments (differences between previous actuarial assumptions and actual occurrence), the effects of changes in actuarial assumptions and actual return on scheme assets (excluding amounts included in the interest on the assets).

Reconciliation to the balance sheet:

	2022 $ Million	2021 $ Million
Total market value of assets	1,167	2,073
Present value of scheme liabilities	(862)	(1,526)
Gross pension asset	**305**	**547**
Related deferred tax liability	(86)	(181)
Net pension asset	219	366

8. **Pension** (continued)

	2022 $ Million	2021 $ Million
Surplus in scheme at beginning of the year	547	449
Current service cost	(5)	(7)
Contributions	8	9
Past service cost	—	(3)
Curtailments	(2)	(2)
Other finance income	10	7
Remeasurement (losses)/gains	(195)	99
Foreign exchange adjustment	(58)	(5)
Surplus in scheme at end of year	**305**	**547**

CGML recognises a surplus in accordance with the requirements of IFRIC 14. The trustees of the Scheme do not have the unilateral right to commence wind-up of the Scheme. Thus, CGML assumes that the Scheme will continue in existence until the last benefit payments are made to members, at which point any residual assets will be returned to the employer in line with the rules of the Scheme.

The changes to the present value of the defined obligation during the year are as follows:

	2022 $ Million	2021 $ Million
Opening defined benefit obligation	1,526	1,685
Current service cost	5	7
Past service cost	—	3
Interest expense	27	24
Remeasurement gains on scheme liabilities	(487)	(104)
Net benefits paid out	(48)	(75)
Curtailments	2	2
Foreign exchange adjustment	(163)	(16)
Closing defined benefit obligation	862	1,526

The changes to the fair value of scheme assets during the year are as follows:

	2022 $ Million	2021 $ Million
Opening fair value of scheme assets	2,073	2,134
Interest income on pension scheme assets	36	31
Remeasurement gains on scheme assets	(682)	(5)
Contributions by the employer	8	9
Net benefits paid out	(48)	(75)
Administrative expenses	(2)	(2)
Foreign exchange adjustment	(218)	(19)
Closing fair value of scheme assets	1,167	2,073

8. Pension (continued)

The actual return on assets is as follows:

	2022 $ Million	2021 $ Million
Interest income on pension scheme assets	36	31
Remeasurement losses on scheme assets	(682)	(5)
Actual return on assets	(646)	26

The interest income on scheme assets is set using the discount rate assumption. In 2022, asset values decreased by $672 million due to a rise in bond yields during the year. In 2021, asset values decreased by $5 million due to a slight rise in bond yields decreased during the year.

The table below sets out the history of experience gains and losses:

	2022 $ Million	2021 $ Million	2020 $ Million	2019 $ Million	2018 $ Million
(Losses)/gains on scheme assets due to experience	(681)	(5)	184	132	(75)
Gains/(losses) on scheme liabilities due to experience	(44)	18	(31)	14	(46)
Gains/(losses) on scheme liabilities due to assumptions	530	86	(185)	(190)	133
Remeasurements recognised in Statement of Comprehensive Income	(195)	99	(32)	(44)	12
Related deferred tax	82	(58)	—	11	(3)
Total gains/(losses) recognised in Statement of Comprehensive Income net of tax	(113)	41	(32)	(33)	9

8. Pension (continued)

The key assumptions used for IAS 19 are the discount rate, inflation and mortality. If different assumptions were used, this could have a material effect on the results disclosed. The sensitivity of the results to these assumptions is set out in the table below.

Sensitivity to key assumptions	2022 Change in defined benefit obligation increase/ (decrease) $ Million	2021 Change in defined benefit obligation increase/ (decrease) $ Million
Effect of increasing the discount rate assumption by 1%	(114)	(260)
Effect of decreasing the discount rate assumption by 1%	141	343
Effect of increasing the salary increase assumption by 1%	5	11
Effect of decreasing the salary increase assumption by 1%	(5)	(10)
Effect of increasing the life expectancy assumption by 1 year	28	56
Effect of increasing the pension increase assumption by 1%	98	230
Effect of decreasing the pension increase assumption by 1%	(81)	(184)
Effect of increasing the inflation assumption by 1%	74	168
Effect of decreasing the inflation assumption by 1%	(67)	(142)

In valuing the liabilities of the pension fund, mortality assumptions have been made as indicated above. If life expectancy had been changed to assume that all members of the fund lived for one year longer, the value of the reported liabilities would have increased by $28 million (2021: increase of $56 million).

The sensitivity information shown above is approximate and has been determined taking into account the duration of the liabilities and the overall profile of the Scheme membership. The methods and assumptions used in preparing the sensitivity analysis above have not changed from the prior year.

9. Share-based incentive plans

As part of the Company's remuneration programme, it participates in a number of Citigroup share-based incentive plans. These plans involve the granting of restricted or deferred share awards and share payments. Such awards are used to attract, retain and motivate officers and employees to provide incentives for their contributions to the long-term performance and growth of the Company, and to align their interests with those of the shareholders. The award programmes are administered by the Personnel and Compensation Committee of the Citigroup Inc. Board of Directors, which is composed entirely of non-employee directors.

In the share award programme Citigroup issues common shares in the form of restricted share awards, deferred share awards and share payments. For all stock award programmes during the applicable vesting period, the shares awarded are not issued to participants (in the case of a deferred stock award) or cannot be sold or transferred by the participants (in the case of a restricted stock award), until after the vesting conditions have been satisfied. Recipients of deferred share awards do not have any shareholder rights until shares are delivered to them, but they generally are entitled to receive dividend-equivalent payments during the vesting period. Recipients of restricted share awards are entitled to a limited voting right and to receive dividend or dividend-equivalent payments during the vesting period. Once a share award vests the shares become freely transferable, but in the case of certain employees, may be subject to transfer restriction by their terms or share ownership commitment.

In prior years, certain stock-based awards were subject to discretionary clawback provisions and as such subject to variable accounting. Under variable accounting the associated value of the award liability moves in line with changes in Citigroup's common stock price until the date that the award vests. Any fluctuation from the grant date value of the award until the award is fully vested is recognised through the income statement.

9. Share-based incentive plans (continued)

In April 2017 Citigroup made amendments to its UK awards prospectus which enabled the adoption of fixed accounting for all remaining, previously awarded, variable accounting unvested awards using a modification price of $59.39 (set at the end of April when the decision was confirmed). The difference between the grant price of all remaining, previously awarded, variable accounting unvested awards and the modification price was recognised through the income statement, any further fluctuations in share price from the modification price to the vesting date would be recognised in equity, in line with other non-variable accounting share based payment award types.

(i) Stock award programme

The Company participates in the Citigroup Capital Accumulation Programme (CAP), under which shares of Citigroup common stock are awarded in the form of restricted or deferred stock to participating employees.

Generally CAP awards of restricted or deferred stock constitute a percentage of annual incentive compensation and vest over a three or four year period beginning on or about the first anniversary of the award date. Except in specific circumstances, continuous employment within Citigroup is required for CAP and other stock award programmes to vest.

The programme provides that employees who meet certain age plus years-of-service requirements (retirement-eligible employees) may terminate active employment and continue vesting in their awards provided they comply with specified non-compete provisions. Awards granted to retirement-eligible employees are accrued in the year prior to the grant date in the same manner as cash incentive compensation is accrued.

For all stock award programmes, during the applicable vesting period, the shares awarded cannot be sold or transferred by the participant, and the award is subject to cancellation if the participant's employment is terminated. After the award vests, the shares become freely transferable (subject to specific sale restrictions). From the date of award, the recipient of a restricted stock award can direct the vote of the shares and receive regular dividends to the extent dividends are paid on Citigroup common stock. Recipients of deferred stock awards receive dividend equivalents to the extent dividends are paid on Citigroup common stock, but cannot vote.

Stock awards granted generally vest 25% per year over four years or 33% per year over 3 years.

As part of remuneration since 2010, the Company entered into an arrangement referred to as an "EU Short Term" award. The award will be delivered in the form of immediately vested restricted shares subject to a six month sale restriction.

	2022	2021	2020	2019	2018
Shares awarded	3,758,010	4,083,428	2,750,205	3,042,789	2,921,491
Weighted average fair market value per share	$62.92	$59.95	$74.41	$59.66	$72.78

(ii) Stock option programme

In prior years, the Company made discretionary grants of options to eligible employees pursuant to the broad-based Citigroup Employee Option Grant (CEOG) Programme under the Citigroup Stock Incentive Plan. The last options granted under the plan were in 2011. There are no options outstanding. Full details on the history of CEOG can be found in the Company's prior year financial statements.

9. Share-based incentive plans (continued)

(iii) Profit and loss statement impact

The table below details the profit and loss impact of the share based incentive plans.

	2022 $ Million	2021 $ Million
Stock Awards		
Granted in 2022	177	
Granted in 2021	32	180
Granted in 2020	9	30
Granted in 2018	2	8
Granted in 2017	—	1
Granted in 2016	—	—
Accrued Expenses	(8)	5
Total Expense (Note 7)	212	224
From which Fixed Share-based incentive expense	152	159
From which Variable Share-based incentive expense	60	66
Fair value adjustment of intercompany recharges in equity reserve	85	(3)
Deferred tax impact of fair value adjustment in equity reserve	(23)	—
Net fair value adjustment of intercompany recharges in equity reserve	62	(3)
Total carrying amount of equity-settled transaction liability	378	446
Total carrying amount of cash-settled transaction liability	10	—

10. Directors' remuneration

Directors' remuneration in respect of services to the Company was as follows:

	2022 $'000	2021 $'000
Aggregate emoluments	4,663	6,393
Contributions to defined contribution pension scheme	46	79
	4,709	6,472

The contributions to the money purchase pension schemes are accruing to eight of the Directors (2021: seven). Five of the Directors (2021: six) of the Company participate in parent company share plans.

The remuneration of the highest paid Director was $1,644,055 (2021: $2,393,088) and accrued pension of $39,749 (2021: $1,979).

The Directors benefit from qualifying third party indemnity provisions in place during the financial year and at the date of this report.

The above remuneration is based on the apportionment of time incurred by the Directors for services to the Company, both in their capacity as a Director and, where applicable, their normal employment.

11. Tax on profit on ordinary activities

(a) Analysis of tax charge in the year

	2022 $ Million	2021 $ Million
Current tax:		
UK corporation tax	48	118
Adjustment in respect of UK corporation tax for previous years	(15)	(10)
Double taxation relief	(50)	(95)
Overseas current tax	67	96
Adjustment in respect of overseas tax for previous years	1	(1)
Total current tax	51	108
Deferred tax:		
Origination and reversal of temporary differences		
– movement on Pension Asset	(13)	2
– movement on other temporary differences (Note 22)	(35)	(46)
– rate change adjustment	31	(52)
Adjustment in respect of deferred tax for earlier years:	31	19
Total deferred tax	14	(77)
Tax charge on ordinary activities	65	31

(b) Factors affecting tax charge for the year

The table below illustrates how the tax chargeable on operating profit for the year is impacted by non-taxable items and available reliefs.

	2022 $ Million	2021 $ Million
Profit on ordinary activities before tax	343	434
Profit on ordinary activities multiplied by the standard rate of corporation tax in the UK of 27% (2021: 27%)	93	117
Effects of:		
Expenses not deductible for tax purposes	25	9
Income not taxable	(42)	(2)
Foreign withholding tax not creditable	17	1
Adjustments in relation to previous years	16	8
Foreign exchange	—	1
Rate change adjustment	31	(50)
Current tax on AT1 coupon	(75)	(53)
Total tax charge for year	65	31

11. Tax on profit on ordinary activities (continued)

(c) Aggregate current and deferred tax relating to items recognised directly in equity

	2022 $ Million	2021 $ Million
Deferred tax on remeasurement of pension in Statement of comprehensive income	(82)	58
Deferred tax associated with loss on DVA in Statement of comprehensive income	105	(5)
Deferred tax associated with Share based payment transactions in equity	23	—
Corporation Tax on IFRS 9 transitional adjustments	2	2
Deferred Tax on IFRS 9 transitional adjustments	(2)	(2)
Corporation tax on DVA adjustment in Retained Earnings	—	(8)
Total current and deferred tax charge/(credit) recognised in equity	46	45

(d) Factors that will affect future tax charges

The UK tax rate in the year was 27%. This includes a surcharge of 8% on the profits of banking companies applicable from 1 January 2016. The main rate of corporation tax in the UK (excluding the surcharge) has been 19% from 1 April 2017. Finance Act 2021, which received Royal. Assent on 10 June 2021, introduced an increase in the UK corporation tax rate to 25% from 1 April 2023. Finance Act 2022, which received. Royal Assent on 24 February 2022, introduced a decrease in the bank surcharge from 8% to 3% from 1 April 2023. The impact of both rate changes have been reflected in the rate used to calculate closing deferred tax, as this is the rate substantively enacted at the Balance Sheet date.

12. Cash at bank

The following amounts are included within cash at bank:

	2022 $ Million	2021 $ Million
Cash at bank held by other financial institutions	5,183	6,090
Cash at bank held by other group undertakings	1,893	2,373
	7,076	8,463

Included within cash held by other financial institutions is $1,735 million (2021: $2,620 million) that is held on behalf of financial institutions and reported as restricted cash. Included within cash held by other group undertakings is $21 million (2021: $245 million) on behalf of financial institutions and reported as restricted cash.

13. Derivatives

	2022 Fair Value		2021 Fair Value	
	Asset $ Million	Liability $ Million	Asset $ Million	Liability $ Million
Interest rate derivatives	134,473	107,356	88,005	91,967
Foreign exchange derivatives	21,515	22,792	14,711	12,861
Credit derivatives	12,083	11,828	16,252	16,610
Equity derivatives	16,512	18,148	19,479	21,835
Commodity derivatives	13,382	38,601	18,834	18,524
	197,965	198,725	157,281	161,797

In the ordinary course of its business, CGML enters into various types of derivative transactions, which include:

- Swap contracts - commitments to settle in cash at a future date or dates ranging from a few days to a number of years, based on differentials between specified instruments or indices, as applied to a notional principal amount;
- Option contracts - the right but not the obligation to buy or sell within a specified time a financial asset at a fixed price over a specified time period; and
- Futures and forward contracts - commitments to buy or sell at a future date a financial asset at a fixed price.

Derivative transactions may be OTC agreements which are bilaterally negotiated with counterparties and either settled with those counterparties or novated and cleared through CCPs. Others are standardised contracts traded on an exchange with the CCP as the counterparty to the trade. Derivatives expose CGML to market, credit or liquidity risks which are described further in Note 29 'Financial instruments and risk management' and which may impact the amount, timing and certainty of future cash flows.

14. Financial assets at fair value through profit or loss

Financial assets measured at fair value through profit or loss form part of the trading portfolio of the Company and comprise marketable securities and other financial assets. The following amounts are included in financial assets held at fair value.

	2022 Total $ Million	2021 Total $ Million
Financial assets mandatorily at fair value through profit and loss		
Derivatives (Note 13)	197,965	157,281
Inventory		
Government bonds	23,964	28,937
Non-government bonds	11,412	11,486
Equities	20,558	20,990
Commodities	1,539	3,248
Commercial Paper	27	90
	57,500	64,751
Equity securities held for investment (Note 16)	122	106
Financial assets designated at fair value through profit or loss		
Collateralised financing transactions	80,372	81,701
	335,959	303,839

Included in Derivatives are listed instruments amounting to $5,904 million (2021: $6,465 million). Included in Inventory are listed instruments amounting to $48,117 million (2021: $60,435 million).

15. Financial assets and liabilities accounting classifications and fair values

The table below sets out the Company's classification of each class of financial assets and liabilities, and their fair values. Those measured at fair value, whether mandatorily or designated as such, are further allocated to levels in the fair value hierarchy in the table on the following page.

31 December 2022	Mandatorily at FVTPL $ Million	Designated at FVTPL $ Million	Amortised cost $ Million	Mandatorily at FVTPL - equity investments $ Million	Total carrying amount $ Million	Fair value $ Million
Cash	—	—	7,076	—	7,076	7,076
Derivatives	197,965	—	—	—	197,965	197,965
Inventory	57,500	—	—	—	57,500	57,500
Equity securities held for investment	—	—	—	122	122	122
Collateralised financing transactions	—	80,372	91,817	—	172,189	172,189
Cash collateral pledged	—	—	65,000	—	65,000	65,000
Trade debtors	—	—	15,881	—	15,881	15,881
Other debtors	—	—	644	—	644	644
	255,465	80,372	180,418	122	516,377	516,377
Bank loans and overdrafts	—	—	10,644	—	10,644	10,035
Derivatives	198,725	—	—	—	198,725	198,725
Securities sold but not yet purchased	52,347	—	—	—	52,347	52,347
Collateralised financing transactions	—	52,123	62,240	—	114,363	114,363
Hybrid financial liabilities	—	26,311	—	—	26,311	26,311
Cash collateral held	—	—	62,682	—	62,682	62,682
Trade creditors	—	—	12,080	—	12,080	12,080
Other creditors and accruals	—	—	2,196	—	2,196	2,196
Subordinated loans	—	—	11,100	—	11,100	11,926
	251,072	78,434	160,942	—	490,448	490,665

15. Financial assets and liabilities accounting classifications and fair values (continued)

31 December 2021	Mandatorily at FVTPL $ Million	Designated at FVTPL $ Million	Amortised cost $ Million	Mandatorily at FVTPL - equity investments $ Million	Total carrying amount $ Million	Fair value $ Million
Cash	—	—	8,463	—	8,463	8,463
Derivatives	157,281	—	—	—	157,281	157,281
Inventory	64,751	—	—	—	64,751	64,751
Equity securities held for investment	—	—	—	106	106	106
Collateralised financing transactions	—	81,701	76,862	—	158,563	158,563
Cash collateral pledged	—	—	35,263	—	35,263	35,263
Trade debtors	—	—	21,160	—	21,160	21,160
Other debtors	—	—	376	—	376	376
	222,032	81,701	142,124	106	445,963	445,963
Bank loans and overdrafts	—	—	7,201	—	7,201	7,302
Derivatives	161,797	—	—	—	161,797	161,797
Securities sold but not yet purchased	65,997	—	—	—	65,997	65,997
Collateralised financing transactions	—	43,245	63,067	—	106,312	106,312
Hybrid financial liabilities	—	26,143	—	—	26,143	26,143
Cash collateral held	—	—	27,948	—	27,948	27,948
Trade creditors	—	—	16,385	—	16,385	16,385
Other creditors and accruals	—	—	2,044	—	2,044	2,044
Subordinated loans	—	—	8,600	—	8,600	9,743
	227,794	69,388	125,245	—	422,427	423,671

15. Financial assets and liabilities accounting classifications and fair values (continued)

The following table shows an analysis of financial assets and liabilities measured at fair value by level in the hierarchy:

31 December 2022	Level 1 $ Million	Level 2 $ Million	Level 3 $ Million	Total $ Million
Financial assets mandatorily at fair value				
Derivatives	22	194,423	3,520	197,965
Government bonds	20,504	3,412	48	23,964
Non-government bonds	987	9,982	443	11,412
Equities	19,383	1,101	74	20,558
Commodities	—	1,539	—	1,539
Commercial Paper	—	27	—	27
	40,896	210,484	4,085	255,465
Financial assets designated at fair value				
Collateralised financing transactions	—	79,987	385	80,372
Other financial assets at fair value through P&L				
Equity securities held for investment	—	—	122	122
	40,896	290,471	4,592	335,959
Financial liabilities mandatorily at fair value				
Derivatives	22	193,716	4,987	198,725
Securities sold but not yet purchased	47,478	4,856	13	52,347
	47,500	198,572	5,000	251,072
Financial liabilities designated at fair value				
Collateralised financing transactions	—	52,123	—	52,123
Hybrid financial liabilities	—	22,316	3,995	26,311
	47,500	273,011	8,995	329,506

15. **Financial assets and liabilities accounting classifications and fair values** (continued)

31 December 2021	Level 1 $ Million	Level 2 $ Million	Level 3 $ Million	Total $ Million
Financial assets mandatorily at fair value				
Derivatives	7	154,310	2,964	157,281
Government bonds	19,950	8,958	29	28,937
Non-government bonds	1,206	9,619	661	11,486
Equities	20,632	316	42	20,990
Commodities	—	3,248	—	3,248
Commercial Paper	—	90	—	90
	41,795	176,541	3,696	222,032
Financial assets designated at fair value				
Collateralised financing transactions	—	81,609	92	81,701
Other financial assets at fair value through P&L				
Equity securities held for investment	—	—	106	106
	41,795	258,150	3,894	303,839
Financial liabilities mandatorily at fair value				
Derivatives	27	158,035	3,735	161,797
Securities sold but not yet purchased	50,399	15,558	40	65,997
	50,426	173,593	3,775	227,794
Financial liabilities designated at fair value				
Collateralised financing transactions	—	43,245	—	43,245
Hybrid financial liabilities	—	21,972	4,171	26,143
	50,426	238,810	7,946	297,182

During the 12 months ended December 31, 2022, above the $100 million threshold, a total balance of $3.2 billion was transferred to Level 2 from Level 1 and $13.7 billion was transferred to Level 1 from Level 2. Transfers between Level 1 and Level 2 were driven by changes in Bloomberg Valuation Service (BVAL) scores, which reflects changes in the amount and consistency of the market inputs used to calculate each price.

The following table shows an analysis of financial assets and liabilities classified as held at amortised cost by level in the hierarchy:

31 December 2022	Level 1 $ Million	Level 2 $ Million	Level 3 $ Million	Total $ Million
Financial assets at amortised cost				
Cash	—	7,076	—	7,076
Collateralised financing transactions	—	91,817	—	91,817
Cash collateral pledged	—	65,000	—	65,000
Trade debtors	—	15,881	—	15,881
Other debtors	—	644	—	644
	—	180,418	—	180,418
Financial liabilities at amortised cost				
Bank loans and overdrafts	—	10,644	—	10,644
Collateralised financing transactions	—	62,240	—	62,240
Cash collateral held	—	62,682	—	62,682
Trade creditors	—	12,080	—	12,080
Other creditors and accruals	—	2,196	—	2,196
Subordinated loans	—	11,100	—	11,100
	—	160,942	—	160,942

15. Financial assets and liabilities accounting classifications and fair values (continued)

31 December 2021	Level 1 $ Million	Level 2 $ Million	Level 3 $ Million	Total $ Million
Financial assets at amortised cost				
Cash	—	8,463	—	8,463
Collateralised financing transactions	—	76,862	—	76,862
Cash collateral pledged	—	35,263	—	35,263
Trade debtors	—	21,160	—	21,160
Other debtors	—	376	—	376
	—	142,124	—	142,124
Financial liabilities at amortised cost				
Bank loans and overdrafts	—	7,201	—	7,201
Collateralised financing transactions	—	63,067	—	63,067
Cash collateral held	—	27,948	—	27,948
Trade creditors	—	16,385	—	16,385
Other creditors	—	2,044	—	2,044
Subordinated loans	—	8,600	—	8,600
	—	125,245	—	125,245

Given the short term nature and characteristics of collateralised financing transactions, trade debtors, other debtors, trade creditors, other creditors and accruals the fair value has been assumed to approximate the carrying value. The fair value of subordinated loans has been calculated using the present value of future estimated cash flows, discounted using a discount rate of USD 3 month Overnight Indexed Swap (OIS) plus the Company's credit spread as at 31 December 2022.

Fair Value Measurement

IFRS 13 – *Fair Value Measurement,* defines fair value, establishes a consistent framework for measuring fair value and requires disclosures about fair value measurements. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date, and therefore represents an exit price. Among other things, the standard requires the Company to maximise the use of observable inputs and minimise the use of unobservable inputs when measuring fair value.

Under IFRS 13, the probability of default of a counterparty is factored into the valuation of derivative positions and, the impact of the Company's own credit risk is also factored into the valuation of derivatives and other liabilities that measured at fair value.

Fair Value Hierarchy

IFRS 13 specifies a hierarchy of inputs based on whether the inputs are observable or unobservable. Observable inputs are developed using market data and reflect market participant assumptions, while unobservable inputs reflect the Company's market assumptions.

The two types of inputs have created the following fair value hierarchy:

- Level 1: Quoted prices for identical instruments in active markets.
- Level 2: Quoted prices for similar instruments in active markets; quoted prices for identical or similar instruments in markets that are not active and model-derived valuations in which all significant inputs and significant value drivers are observable in the market.
- Level 3: Valuations derived from valuation techniques in which one or more significant inputs or significant value drivers are unobservable.

15. Financial assets and liabilities accounting classifications and fair values (continued)

Fair Value Hierarchy (continued)

As required under the fair value hierarchy, the Company considers relevant and observable market inputs in its valuations where possible.

The fair value hierarchy classification approach typically utilizes rules-based and data driven selection criteria to determine whether an instrument is classified as Level 1, Level 2, or Level 3:

- The determination of whether an instrument is quoted in an active market and therefore considered a Level 1 instrument is based upon the frequency of observed transactions and the quality of independent market data available on the measurement date.
- A Level 2 classification is assigned where there is observability of prices / market inputs to models, or where any unobservable inputs are not significant to the valuation. The determination of whether an input is considered observable is based on the availability of independent market data and its corroboration, for example through observed transactions in the market.
- Otherwise, an instrument is classified as Level 3.

Determination of Fair Value

For assets and liabilities carried at fair value, the Company measures fair value using the procedures set out below, irrespective of whether the assets and liabilities are measured at fair value as a result of an election, a non-recurring lower of-cost-or-market (LOCOM) adjustment, or because they are required to be measured at fair value.

When available, the Company uses quoted market prices from active markets to determine fair value and classifies such items as Level 1. In some specific cases where a market price is available, the Company will apply practical expedients (such as matrix pricing) to calculate fair value, in which case the items may be classified as Level 2.

The Company may also apply a price-based methodology that utilizes, where available, quoted prices or other market information obtained from recent trading activity in positions with the same or similar characteristics to the position being valued. If relevant and observable prices are available , those valuations may be classified as Level 2. However, when there are one or more significant unobservable "price" inputs,those valuations will be classified as Level 3. Furthermore, when a quoted price is considered stale, a significant adjustment to the price of a similar security may be necessary to reflect differences in the terms of the actual security or loan being valued, or alternatively, when prices from independent sources maybe insufficient to corroborate the valuation, the "price" inputs are considered unobservable and the fair value measurements are classified as Level 3.

If quoted market prices are not available, fair value is based upon internally developed valuation techniques that use, where possible, current market-based parameters, such as interest rates, currency rates and option volatilities. Items valued using such internally generated valuation techniques are classified according to the lowest level input or value driver that is significant to the valuation. Thus, an item may be classified as Level 3 even though there may be some significant inputs that are readily observable.

Fair value estimates from internal valuation techniques are verified, where possible, to prices obtained from independent vendors or brokers. Vendors' and brokers' valuations may be based on a variety of inputs ranging from observed prices to proprietary valuation models, and the Company assesses the quality and relevance of this information in determining the estimate of the fair value. The following section describes the valuation methodologies used by the Company to measure various financial instruments at fair value. Where appropriate, the description includes details of the valuation models, the key inputs to those models and any significant assumptions.

Market valuation adjustments

Generally, the unit of account for a financial instrument is the individual financial instrument. The Company applies market valuation adjustments that are consistent with the unit of account, which does not include adjustment due to the size of the Company's position, except as follows.

15. Financial assets and liabilities accounting classifications and fair values (continued)

Market valuation adjustments (continued)

IFRS 13 permits an exception, through an accounting policy election, to measure the fair value of a portfolio of financial assets and financial liabilities on the basis of the net open risk position when certain criteria are met. Citi has elected to measure certain portfolios of financial instruments that meet those criteria, such as derivatives, on the basis of the net open risk position. The Company applies market valuation adjustments, including adjustments to account for the size of the net open risk position, consistent with market participant assumptions.

Valuation adjustments are applied to items classified as Level 2 or Level 3 in the fair value hierarchy to ensure that the fair value reflects the price at which the net open risk position could be exited. These valuation adjustments are based on the bid/offer spread for an instrument in the market. When Citi has elected to measure certain portfolios of financial investments, such as derivatives, on the basis of the net open risk position, the valuation adjustment may take into account the size of the position.

Credit valuation adjustments (CVA) and funding valuation adjustments (FVA) are applied to the relevant population of over-the-counter (OTC) derivative instruments where adjustments to reflect counterparty credit risk, own credit risk and term funding risk are required to estimate fair value. This principally includes derivatives with a base valuation (e.g., discounted using overnight indexed swap (OIS)) requiring adjustment for these effects, such as uncollateralized interest rate swaps. The CVA represents a portfolio-level adjustment to reflect the risk premium associated with the counterparty's (assets) or Company's (liabilities) non-performance risk.

The FVA represents a market funding risk premium inherent in the uncollateralized portion of a derivative portfolio and in certain collateralized derivative portfolios that do not include standard credit support annexes (CSAs), such as where the CSA does not permit the reuse of collateral received. Company's FVA methodology leverages the existing CVA methodology to estimate a funding exposure profile. The calculation of this exposure profile considers collateral agreements in which the terms do not permit the Company to reuse the collateral received, including where counterparties post collateral to third-party custodians. Company's CVA and FVA methodologies consist of two steps:

- First, the exposure profile for each counterparty is determined using the terms of all individual derivative positions and a Monte Carlo simulation or other quantitative analysis to generate a series of expected cash flows at future points in time. The calculation of this exposure profile considers the effect of credit risk mitigants and sources of funding, including pledged cash or other collateral and any legal right of offset that exists with a counterparty through arrangements such as netting agreements. Individual derivative contracts that are subject to an enforceable master netting agreement with a counterparty are aggregated as a netting set for this purpose, since it is those aggregate net cash flows that are subject to non performance risk. This process identifies specific, point-in-time future cash flows that are subject to non performance and term funding risk, rather than using the current recognized net asset or liability as a basis to measure the CVA and FVA.
- Second, for CVA, market-based views of default probabilities derived from observed credit spreads in the credit default swap (CDS) market are applied to the expected future cash flows determined in step one. Citi's own credit CVA is determined using Citi-specific CDS spreads for the relevant tenor. Generally, counterparty CVA is determined using CDS spread indices for each credit rating and tenor. For certain identified netting sets where individual analysis is practicable (e.g., exposures to counterparties with liquid CDSs), counterparty-specific CDS spreads are used. For FVA, a term structure of spreads is applied to the expected funding exposures (e.g., the market liquidity spread used to represent the term funding premium associated with certain OTC derivatives).

The CVA and FVA are designed to incorporate a market view of the credit and funding risk, respectively, inherent in the derivative portfolio. However, most unsecured derivative instruments are negotiated bilateral contracts and are not commonly transferred to third parties. Derivative instruments are normally settled contractually or, if terminated early, are terminated at a value negotiated bilaterally between the counterparties. Thus, the CVA and FVA may not be realized upon a settlement or termination in the normal course of business.

15. Financial assets and liabilities accounting classifications and fair values (continued)

Market valuation adjustments (continued)

In addition, all or a portion of these adjustments may be reversed or otherwise adjusted in future periods in the event of changes in the credit or funding risk associated with the derivative instruments.

Securities Purchased Under Agreements to Resell and Securities Sold Under Agreements to Repurchase

No quoted prices exist for these instruments, since fair value is determined using a discounted cash flow technique. Cash flows are estimated based on the terms of the contract, taking into account any embedded derivative or other features. These cash flows are discounted using interest rates appropriate to the maturity of the instrument as well as the nature of the underlying collateral. Generally, when such instruments are recorded at fair value, they are classified within Level 2 of the fair value hierarchy, as the inputs used in the valuation are readily observable. However, certain long-dated positions are classified within Level 3 of the fair value hierarchy

Trading Account Assets and Liabilities—Trading Securities and Trading Loans

When available, the Company uses quoted market prices in active markets to determine the fair value of trading securities; such items are classified as Level 1 of the fair value hierarchy. Examples include government securities and exchange-traded equity securities.

For bonds and secondary market loans traded over the counter, the Company generally determines fair value utilizing various valuation techniques, including discounted cash flows, price-based and internal models. Fair value estimates from these internal valuation techniques are verified, where possible, to prices obtained from independent sources, including third-party vendors.

A price-based methodology utilizes, where available, quoted prices or other market information obtained from recent trading activity of assets with similar characteristics to the bond or loan being valued. The yields used in discounted cash flow models are derived from the same price information. Trading securities and loans priced using such methods are generally classified as Level 2. However, when the primary inputs to the valuation are unobservable, or prices from independent sources are insufficient to corroborate valuation, a loan or security is generally classified as Level 3. Fair value estimates from these internal valuation techniques are verified, where possible, to prices obtained from independent sources, including third-party vendors.

When the Company's principal exit market for a portfolio of loans is through securitization, the Company uses the securitization price as a key input into the fair value of the loan portfolio. The securitization price is determined from the assumed proceeds of a hypothetical securitization within the current market environment. Where such a price verification is possible, loan portfolios are typically classified as Level 2 in the fair value hierarchy.

Trading Account Assets and Liabilities — Derivatives

Exchange-traded derivatives, measured at fair value using quoted (i.e., exchange) prices in active markets, where available, are classified as Level 1 of the fair value hierarchy.

Derivatives without a quoted price in an active market and derivatives executed over the counter are valued using internal valuation techniques. These derivative instruments are classified as either Level 2 or Level 3 depending on the observability of the significant inputs to the model.

The valuation techniques depend on the type of derivative and the nature of the underlying instrument. The principal techniques used to value these instruments are discounted cash flows and internal models, such as derivative pricing models (e.g., Black-Scholes and Monte Carlo simulations).

The key inputs depend upon the type of derivative and the nature of the underlying instrument and include interest rate yield curves, foreign exchange rates, volatilities and correlation.

15. Financial assets and liabilities accounting classifications and fair values (continued)

Investments

The investments category includes available-for-sale debt and marketable equity securities whose fair values are generally determined by utilizing similar procedures described for trading securities above or, in some cases, using vendor pricing as the primary source.

Also included in investments are non-public investments in private equity and real estate entities. Determining the fair value of non-public securities involves a significant degree of management's judgment, as no quoted prices exist and such securities are not generally traded. In addition, there may be transfer restrictions on private equity securities. The Company's process for determining the fair value of such securities utilizes commonly accepted valuation techniques, including guideline public company analysis and comparable transactions. In determining the fair value of non public securities, the Company also considers events such as a proposed sale of the investee company, initial public offerings, equity issuances or other observable transactions. Private equity securities are generally classified as Level 3 of the fair value hierarchy.

In addition, the Company holds investments in certain alternative investment funds that calculate NAV per share, including hedge funds, private equity funds and real estate funds. Investments in funds are generally classified as nonmarketable equity securities carried at fair value. The fair values of these investments are estimated using the NAV per share of the Company's ownership interest in the funds where it is not probable that the investment will be realized at a price other than the NAV.

Short-Term Borrowings and Long-Term Debt

Where fair value accounting has been elected, the fair value of non-structured liabilities is determined by utilizing internal models using the appropriate discount rate for the applicable maturity. Such instruments are classified as Level 2 of the fair value hierarchy when all significant inputs are readily observable.

The Company determines the fair value of hybrid financial instruments, including structured liabilities, using the appropriate derivative valuation methodology (described above in "Trading Account Assets and Liabilities—Derivatives") given the nature of the embedded risk profile. Such instruments are classified as Level 2 or Level 3 depending on the observability of significant inputs to the model.

Collateralised financing transactions

No quoted prices exist for such financial instruments and so fair value is determined using a discounted cash-flow technique. Cash flows are estimated based on the terms of the contract, taking into account any embedded derivative or other features. Expected cash flows are discounted using market rates appropriate to the maturity of the instrument as well as the nature and amount of collateral taken or received. Generally, when such instruments are held at fair value, they are classified within Level 2 of the fair value hierarchy as the inputs used in the valuation are readily observable.

Changes in Level 3 Fair Value Category

The following tables present the changes in the Level 3 fair value category for the years ended 31 December 2022 and 31 December 2021. Gains and losses presented below include changes in the fair value related to both observable and unobservable inputs. CGML often hedges positions with offsetting positions that are classified in a different level.

15. Financial assets and liabilities accounting classifications and fair values (continued)

Changes in Level 3 Fair Value Category (continued)

2022	At 1 January 2022	Gain/(loss) recorded in the profit and loss statement		Purchases	Sales	Issuances	Settlements	Transfers into Level 3	Transfers out of Level 3	At 31 December 2022
		Realised	Unrealised							
	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million
Financial assets mandatorily at fair value										
Derivatives	2,964	(1,341)	2,108	274	(27)	85	—	2,376	(2,919)	3,520
Government bonds	29	(21)	(29)	148	(81)	—	—	49	(47)	48
Non-government bonds	661	72	(118)	1,117	(1,308)	—	—	408	(389)	443
Equities	42	80	(34)	123	(169)	—	—	81	(49)	74
Financial assets designated at fair value										
Collateralised financing transactions	92	(13)	181	169	—	—	(211)	174	(7)	385
Other assets at fair value through P&L										
Equity securities held for investment	106	—	(7)	23	—	—	—	—	—	122
	3,894	(1,223)	2,101	1,854	(1,585)	85	(211)	3,088	(3,411)	4,592

	At 1 January 2022	(Gain)/loss recorded in the profit and loss statement		Purchases	Sales	Issuances	Settlements	Transfers into Level 3	Transfers out of Level 3	At 31 December 2022
		Realised	Unrealised							
Financial liabilities held for trading	$ Million	$ Million		$ Million	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million
Derivatives	3,735	(1,327)	2,841	264	71	353	—	2,327	(3,278)	4,987
Securities sold but not yet purchased	40	(3)	7	19	7	(10)	(64)	38	(20)	13
Financial liabilities designated at fair value										
Hybrid financial liabilities	4,180	138	(1,163)	—	—	3,249	(2,814)	539	(134)	3,995
	7,955	(1,192)	1,685	283	78	3,592	(2,878)	2,904	(3,432)	8,995

15. Financial assets and liabilities accounting classifications and fair values (continued)

Changes in Level 3 Fair Value Category (continued)

2021	At 1 January 2021	Gain/(loss) recorded in the profit and loss statement		Purchases	Sales	Issuances	Settlements	Transfers into Level 3	Transfers out of Level 3	At 31 December 2021
		Realised	Unrealised							
	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million
Financial assets mandatorily at fair value										
Derivatives	3,008	289	(129)	199	(34)	—	(751)	2,848	(2,466)	2,964
Government bonds	24	23	3	30	(90)	—	—	138	(99)	29
Non-government bonds	485	76	(122)	1,567	(1,197)	—	—	200	(348)	661
Equities	21	23	5	39	(141)	—	—	106	(11)	42
Financial assets designated at fair value										
Collateralised financing transactions	93	(11)	14	217	—	—	(224)	64	(61)	92
Other assets at fair value through P&L										
Equity securities held for investment	99	—	7	—	—	—	—	—	—	106
	3,730	400	(222)	2,052	(1,462)	—	(975)	3,356	(2,985)	3,894

Financial liabilities held for trading	At 1 January 2021	(Gain)/loss recorded in the profit and loss statement		Purchases	Sales	Issuances	Settlements	Transfers into Level 3	Transfers out of Level 3	At 31 December 2021
		Realised	Unrealised							
	$ Million	$ Million		$ Million	$ Million	$ Million	$ Million	$ Million	$ Million	$ Million
Derivatives	2,918	191	1,020	157	(2)	—	(374)	2,858	(3,033)	3,735
Securities sold but not yet purchased	123	18	(81)	10	(10)	30	(41)	24	(33)	40
Financial liabilities designated at fair value										
Collateralised financing transactions	4,492	(104)	(177)	—	—	2,371	(1,900)	266	(777)	4,171
	7,533	105	762	167	(12)	2,401	(2,315)	3,148	(3,843)	7,946

2022 opening balances have been adjusted for collaterised financial transactions to reflect instruments in their original classes, that were previously classified as "unsettled", being issued after the financial period close.

Level 3 Fair Value Transfers

The following were the significant Level 3 transfers for the period December 31, 2021 to December 31, 2022:

- During the 12 months ended December 31, 2022, transfers of Equity Derivative contracts were $2.7 billion ($0.5 billion asset, $2.2 billion liability) from Level 3 to Level 2. This was due to unobservable inputs such as forward, volatility, correlation becoming insignificant relative to their overall valuation, and market changes have resulted in some inputs becoming more observable. In other instances, market changes have resulted in some inputs becoming less observable, and some unobservable inputs becoming more significant to the overall valuation of the instruments (e.g., when an option becomes deep-in or deep-out of the money). This has resulted in $1.9 billion ($0.6 billion asset, $1.3 billion liability) of Equity Derivative contracts being transferred from Level 2 to Level 3.
- During the 12 months ended December 31, 2022, transfers of Commodity derivative contracts were $1.7 billion ($1.1 billion asset, $0.6 billion liability) from Level 3 to Level 2. This was due to increased observability on forwards and swap contracts based on trade data, and unobservable inputs on option contracts becoming insignificant to their overall valuation.
- During the 12 months ended December 31, 2022, transfers of Interest Rate Derivative contracts were $1.5 billion ($0.7 billion asset, $0.7 billion liability) from Level 3 to Level 2. This was due to unobservable inputs becoming insignificant relative to their overall valuation, and market changes have resulted in some inputs becoming more observable.

15. Financial assets and liabilities accounting classifications and fair values (continued)

Level 3 transfer-ins on assets and liabilities were driven by significance testing, Level 3 transfer-outs on assets and liabilities were driven by significance testing, methodology changes and increased trading activity observability.

Fair Value Hierarchy Classification

Unobservable inputs

During the year, total changes in fair value, representing a gain of $385 million (2021: $688 million loss) was recognised in the income statement relating to items where fair value was estimated using a valuation technique that incorporated one or more significant inputs based on unobservable market data. As these valuation techniques were based upon assumptions, changing the assumptions would change the estimate of fair value. The potential impact of using reasonably possible assumptions in line with those used for the Company's Regulatory Prudential Adjustment for the valuation techniques for both observable and unobservable market data has been quantified as approximately $731 million downside and $847 million upside (2021: $647 million downside and $659 million upside). The main contributors to this impact were Equity Markets, Credit Trading and Interest Rates Trading businesses.

Uncertainty of Fair Value Measurements Relating to Unobservable Inputs

Valuation uncertainty arises when there is insufficient or disperse market data to allow a precise determination of the exit value of a fair-valued position or portfolio in today's market. This is especially prevalent in Level 3 fair value instruments, where uncertainty exists in valuation inputs that may be both unobservable and significant to the instrument's (or portfolio's) overall fair value measurement.

The uncertainties associated with key unobservable inputs on the Level 3 fair value measurements may not be independent of one another. In addition, the amount and direction of the uncertainty on a fair value measurement for a given change in an unobservable input depends on the nature of the instrument as well as whether the Company holds the instrument as an asset or a liability. For certain instruments, the pricing, hedging and risk management are sensitive to the correlation between various inputs rather than on the analysis and aggregation of the individual inputs.

The following section describes some of the most significant unobservable inputs used by the Company in Level 3 fair value measurements.

Correlation

Correlation is a measure of the extent to which two or more variables change in relation to each other. A variety of correlation-related assumptions are required for a wide range of instruments, including equity and credit baskets, foreign exchange options, Credit Index Tranches and many other instruments. For almost all of these instruments, correlations are not directly observable in the market and must be calculated using alternative sources, including historical information. Estimating correlation can be especially difficult where it may vary over time, and calculating correlation information from market data requires significant assumptions regarding the informational efficiency of the market (e.g., swaption markets). Uncertainty therefore exists when an estimate of the appropriate level of correlation as an input into some fair value measurements is required.

Changes in correlation levels can have a substantial impact, favorable or unfavorable, on the value of an instrument, depending on its nature. A change in the default correlation of the fair value of the underlying bonds comprising a CDO structure would affect the fair value of the senior tranche. For example, an increase in the default correlation of the underlying bonds would reduce the fair value of the senior tranche, because highly correlated instruments produce greater losses in the event of default and a portion of these losses would become attributable to the senior tranche. That same change in default correlation would have a different impact on junior tranches of the same structure.

15. Financial assets and liabilities accounting classifications and fair values (continued)

Volatility

Volatility represents the speed and severity of market price changes and is a key factor in pricing options. Volatility generally depends on the tenor of the underlying instrument and the strike price or level defined in the contract. Volatilities for certain combinations of tenor and strike are not observable and need to be estimated using alternative methods, such as comparable instruments, historical analysis or other sources of market information. This leads to uncertainty around the final fair value measurement of instruments with unobservable volatilities.

The general relationship between changes in the value of an instrument (or a portfolio) to changes in volatility also depends on changes in interest rates and the level of the underlying index. Generally, long option positions (assets) benefit from increases in volatility, whereas short option positions (liabilities) will suffer losses. Some instruments are more sensitive to changes in volatility than others. For example, an at-the-money option would experience a greater percentage change in its fair value than a deep-in-the-money option. In addition, the fair value of an option with more than one underlying security (e.g., an option on a basket of equities) depends on the volatility of the individual underlying securities as well as their correlations.

Yield

In some circumstances, the yield of an instrument is not observable in the market and must be estimated from historical data or from yields of similar securities. This estimated yield may need to be adjusted to capture the characteristics of the security being valued. Whenever the amount of the adjustment is significant to the value of the security, the fair value measurement is classified as Level 3. Adjusted yield is generally used to discount the projected future principal and interest cash flows on instruments, such as asset-backed securities. Adjusted yield is impacted by changes in the interest rate environment and relevant credit spreads.

Prepayment

Voluntary unscheduled payments (prepayments) change the future cash flows for the investor and thereby change the fair value of the security. The effect of prepayments is more pronounced for residential mortgage-backed securities. Prepayment is generally negatively correlated with delinquency and interest rate. A combination of low prepayments and high delinquencies amplifies each input's negative impact on a mortgage securities' valuation. As prepayment speeds change, the weighted average life of the security changes, which impacts the valuation either positively or negatively, depending upon the nature of the security and the direction of the change in the weighted average life.

Recovery

Recovery is the proportion of the total outstanding balance of a bond or loan that is expected to be collected in a liquidation scenario. For many credit securities (e.g., commercial mortgage backed securities), the expected recovery amount of a defaulted property is typically unknown until a liquidation of the property is imminent. The assumed recovery of a security may differ from its actual recovery that will be observable in the future. Generally, an increase in the recovery rate assumption increases the fair value of the security. An increase in loss severity, the inverse of the recovery rate, reduces the amount of principal available for distribution and, as a result, decreases the fair value of the security.

Credit Spread

Credit spread is a component of the security representing its credit quality. Credit spread reflects the market perception of changes in prepayment, delinquency and recovery rates, therefore capturing the impact of other variables on the fair value. Changes in credit spread affect the fair value of securities differently depending on the characteristics and maturity profile of the security. For example, credit spread is a more significant driver of the fair value measurement

15. Financial assets and liabilities accounting classifications and fair values (continued)

Valuation Techniques and Inputs for Level 3 Fair Value Measurements

The following tables present the valuation techniques covering the majority of Level 3 inventory and the most significant unobservable inputs used in Level 3 fair value measurements as of 31 December 2022 and 31 December 2021. Note that these tables represent key drivers by disclosures line and may not agree back to the Changes in Level 3 Fair Value Category table.

	Fair Value			Range of Inputs		
2022	**$ Million**	**Methodology**	**Input**	**Min**	**Max**	**Unit**
Assets						
Derivative assets	3,520					
Equity Derivatives		Model-based	Equity Volatility	—	300.7	%
		Model-based	Equity-FX Correlation	-95.0	50.0	%
		Model-based	Equity Forward	68.3	271.6	%
		Model-based	Equity-Equity Correlation	-4.0	98.7	%
		Model-based	Commodity-FX Correlation	-40.0	40.0	%
Commodity Derivatives		Model-based	Forward Price	14.3	385.5	%
		Model-based	Commodity Volatility	10.4	151.5	%
		Model-based	Commodity Correlation	-32.0	91.9	%
Credit Derivatives		Model-based	Credit Spread	2.5	955.1	bps
Foreign Exchange Derivatives		Model-based	IR Basis	-4.2	9.7	%
Interest Rate Derivatives		Model-based	Inflation Volatility	0.4	2.7	%
Inventory	565					
Other Bonds Notes & Debentures		Model-based	Equity Volatility	0.0	300.7	%
		Model-based	Equity-FX Correlation	-95.0	50.0	%
Equity Securities		Price-based	Price	0.0	9,087.8	$
Liabilities						
Derivative liabilities	4,987					
Commodity Derivatives		Model-based	Forward Price	14.3	385.5	%
		Model-based	Commodity Volatility	10.4	151.5	%
		Model-based	Commodity Correlation	-32.0	91.9	%
		Model-based	Commodity-FX Correlation	-40.0	40.0	%
Equity Derivatives		Model-based	Equity Volatility	—	300.7	%
		Model-based	Equity-Equity Correlation	-4.0	98.7	%
		Model-based	Commodity-FX Correlation	-40.0	40.0	%
		Model-based	Equity-FX Correlation	-95.0	50.0	%
		Model-based	Equity Forward	68.3	271.6	%
		Model-based	Dividend amount	0.1	279.5	$
		Model-based	FX Volatility	0.1	97.7	%
		Model-based	Equity-IR Correlation	-18.8	60.0	%
		Price-based	Price	—	4,917.6	$
Credit Derivatives		Model-based	Credit Spread	2.5	955.1	bps
Foreign Exchange Derivatives		Model-based	IR Normal Volatility	0.3	1.8	%
		Model-based	IR Basis	-4.2	9.7	%
Interest Rate Derivatives		Model-based	IR Normal Volatility	0.3	1.5	%
		Model-based	Inflation Volatility	0.4	2.7	%
Securities sold but not yet purchased	13	Price-based	Price	0.0	9,087.8	$
		Model-based	Equity Volatility	—	300.7	%
		Model-based	Equity Forward	68.3	271.6	%

15. Financial assets and liabilities accounting classifications and fair values (continued)

Hybrid financial liabilities	3,995	Model-based	Equity Volatility	—	300.7	%
		Model-based	FX Volatility	0.1	97.7	%
		Model-based	Equity-IR Correlation	-18.8	60.0	%
		Model-based	Equity-FX Correlation	-95.0	50.0	%
		Model-based	Equity Forward	68.3	271.6	%
		Model-based	IR Normal Volatility	0.3	1.8	%

2021	Fair Value $ Million	Methodology	Input	Range of Inputs Min	Max	Unit
Assets						
Equity Derivatives	2,964					
Derivative assets						
		Model-based	Equity Volatility	0.1	290.6	%
		Model-based	Equity-FX Correlation	-95.0	80.0	%
		Model-based	Equity Forward	58.0	165.8	%
Commodity Derivatives		Model-based	Forward Price	8.0	599.4	%
		Model-based	Commodity Volatility	10.9	188.3	%
		Model-based	Commodity Correlation	-50.5	89.8	%
Credit Derivatives		Model-based	Credit Spread	1.0	874.7	bps
Foreign Exchange Derivatives		Model-based	Yield	-0.7	0.6	%
Inventory	732					
Non-government bonds		Model-based	Equity Volatility	0.1	290.6	%
		Model-based	Equity-FX Correlation	-95.0	80.0	%
		Model-based	Equity Forward	58.0	165.8	%
Equity		Price-based	Price	0.0	12,874.6	$
Liabilities						
Derivative liabilities	3,735					
Commodity Derivatives		Model-based	Forward Price	8.0	599.4	%
		Model-based	Commodity Volatility	10.9	188.3	%
		Model-based	Commodity Correlation	-50.5	89.8	%
Equity Derivatives		Model-based	Equity Volatility	0.1	290.6	%
		Model-based	FX Volatility	0.1	41.8	%
		Model-based	Equity-IR Correlation	-3.5	60.0	%
		Model-based	Equity-Equity Correlation	-6.5	99.0	%
		Model-based	Commodity Correlation	-50.5	89.8	%
		Model-based	Equity-FX Correlation	-95.0	80.0	%
		Model-based	Equity Forward	58.0	165.8	%
		Model-based	Dividend amount	0.1	264.5	$
Credit Derivatives		Model-based	Credit Spread	1.0	874.7	bps
Foreign Exchange Derivatives		Model-based	Yield	-0.7	0.6	%
Interest Rate Derivatives		Model-based	IR-FX Correlation	-31.9	51.6	%
Securities sold but not yet purchased	40	Price-based	Price	—	12,874.6	$
Hybrid financial liabilities	4,171	Model-based	Equity Volatility	0.1	290.6	%
		Model-based	FX Volatility	0.1	41.8	%
		Model-based	Equity-IR Correlation	-3.5	60.0	%
		Model-based	Commodity Correlation	-50.5	89.8	%
		Model-based	Equity-FX Correlation	-95.0	80.0	%
		Model-based	Equity Forward	58.0	165.8	%
		Model-based	IR Normal Volatility	0.2	0.9	%

16. Equity securities held for investment

	Unlisted Investments 2022 $ Million	Unlisted Investments 2021 $ Million
Fair value		
At 1 January	106	99
Additions	—	—
Disposals	—	—
Gains recognised in income statement	16	7
At 31 December	122	106

17. Involvement with unconsolidated structured entities

The table below describes the types of Variable Interest Entities (VIEs) that are not controlled by CGML but in which it holds an interest.

		2022		2021	
Type of structured entity	**Nature and purpose**	**Total VIE assets $ Million**	**CGML exposure $ Million**	**Total VIE assets $ Million**	**CGML exposure $ Million**
Investment Funds	Fund/Limited Partnership Structure	148	—	200	1
Client Intermediation	Credit Derivative Repack Vehicle/Credit Derivatives	—	—	213	211
Collateralized Loan Obligations	Synthetic CDO	2	1	2	1
		150	1	415	213

Investment funds

The objective of these funds is to seek income and capital gains from investing in US government securities. Funding is provided by investors in the fund, who are professional or institutional investors. CGML is the derivative swap counterparty to the fund which is the source of its exposure. The derivative transactions are FX options and swaps.

Client Intermediation

Client intermediation transactions represent a range of transactions designed to provide investors with specified returns based on the returns of an underlying security, referenced asset or index. The Company's involvement in these transactions includes being the counterparty to the entity's derivative instruments. The derivative transactions are FX options and swaps.

Collateralised Loan Obligations (CLOs)

A collateralised loan obligation (CLO) is a VIE that purchases a portfolio of assets consisting primarily of non-investment grade corporate loans. CLOs issue multiple tranches of debt and equity to investors to fund the asset purchases and pay upfront expenses associated with forming the CLO. Citi serves as a structuring and placement agent with respect to the CLOs. Typically, the debt and equity of the CLOs are sold to third-party investors.

17. Involvement with unconsolidated structured entities (continued)

The Company generally does not have the power to direct the activities that most significantly impact the economic performance of the CLOs, as this power is generally held by a third-party asset manager of the CLO.

18. Other Assets

The following amounts are included in Other Assets:

	2022 $ Million	2021 $ Million
Cash collateral pledged	65,000	35,263
Trade debtors	15,843	21,155
Other debtors	834	603
Prepayments and accrued income	30	23
Corporation tax receivable	126	113
Deferred tax asset (Note 22)	183	337
Intangible fixed assets (Note 19)	289	244
Tangible fixed assets - equipment (Note 19)	—	1
Tangible fixed assets - premises improvement (Note 19)	—	1
	82,305	57,740

Included within Trade Debtors are receivables from central clearing counterparties, securities trading receivables outside standard settlement, and other brokerage receivables.

Other Assets includes the following balances due from other Citi affiliates:

	2022 $ Million	2021 $ Million
Trade debtors	6,587	5,159
Cash collateral pledged	4,813	4,488
Other debtors	397	206
	11,797	9,853

19. Intangible and Tangible fixed assets

The movement in Intangible and Tangible fixed assets for 2022 was as follows:

2022	Intangible	Tangible Fixed Assets	
	Software	Equipment	Premises improvements
	$ Million	$ Million	$ Million
Cost			
At 1 January 2022	753	6	13
Additions	99	—	—
At 31 December 2022	852	6	13
Accumulated amortisation/depreciation			
At 1 January 2022	509	5	12
Charges for the year (Note 7)	54	1	1
At 31 December 2022	563	6	13
Net book value			
At 31 December 2022	289	—	—

The movement in Intangible and Tangible fixed assets for 2021 was as follows:

2021	Intangible	Tangible Fixed Assets	
	Software	Equipment	Premises improvements
	$ Million	$ Million	$ Million
Cost			
At 1 January 2021	670	6	13
Additions	83	—	—
At 31 December 2021	753	6	13
Accumulated amortisation/depreciation			
At 1 January 2021	457	5	11
Charges for the year (Note7)	52	—	1
At 31 December 2021	509	5	12
Net book value			
At 31 December 2021	244	1	1

20. Investments in subsidiary and related undertakings

	2022 $ Million	2021 $ Million
Cost		
At 1st January	3,830	2,125
Additions	500	1,705
At 31st December	4,330	3,830
Impairment		
At 1st January	—	—
At 31st December	—	—
Net book value		
At 31st December	4,330	3,830

Details of all related undertakings held at 31 December 2022 as required by CA2006 SI 2008 No 410 Sch 4 Para 1 are set out below. All undertakings have a year end of 31 December and all of the Company's holdings are of ordinary shares.

On 2 August 2022, CGML made a capital contribution of $500 million to its subsidiary, CGME.

During 2021 CGML made a total of $1,703 million of capital contribution to CGME.

Citigroup Global Markets Luxembourg S.a.R.L was liquidated on 7 December 2021.

Directly held subsidiary undertakings (all 100% owned)

Name	Registered address
Citigroup Global Markets Europe AG	16 Reuterweg, Frankfurt am Main 30323, Germany
Citigroup Global Markets Funding Luxembourg SCA	31, Z.A. Bourmicht, L-8070 Bertrange, Luxembourg
Citigroup Global Markets Funding Luxembourg GP S.a.R.L.	31, Z.A. Bourmicht, L-8070 Bertrange, Luxembourg
Citi Global Wealth Management S.A.M.	Monte Carlo Palace, 7-9 Boulevard des Moulins, MC98000 Monaco

21. Pledged assets

Collateral accepted as security for assets

The fair value of financial assets including government bonds, Eurobonds and other corporate bonds, equities, and cash accepted that were permitted to be sold or re-pledged in the absence of default was $302 billion (2021: $342 billion). The fair value of the collateral accepted that had been re-pledged at 31 December 2022, was $237 billion (2021: $292 billion). The Company was obliged to return equivalent securities. Where the collateral was used in secured financing transactions, these transactions were conducted under terms that are usual and customary to standard lending and securities borrowing and lending activities.

Where the collateral was used for derivative transactions, this was conducted under industry-standard ISDA (International Swaps and Derivatives Association and CSA (Credit Support Annex) agreements.

Financial assets pledged to secure liabilities

The total value of purchased financial assets including government bonds, Eurobonds and other corporate bonds, equities and cash that were pledged as collateral for liabilities at 31 December 2022, was $65 billion (2021: $80 billion). These transactions were conducted under terms that are usual and customary to standard lending and securities borrowing and lending activities.

The table below sets out an analysis of balance sheet encumbered (pledged) and unencumbered (not pledged) assets.

The asset encumbrance analyses below is unaudited.

An asset shall be treated as encumbered if it has been pledged or if it is subject to any form of arrangement to secure, collateralise or credit enhance any transaction from which it cannot be freely withdrawn. Correspondingly an asset shall be deemed to be unencumbered where CGML is not subject to any legal, contractual, regulatory, or other restriction preventing it from liquidating, selling, transferring, assigning or, generally, disposing of such asset via active outright sale or repurchase agreement.

21. Pledged assets (continued)

2022	Encumbered $ Million	Non-encumbered $ Million	Total $ Million
Assets			
Cash at bank and in hand	—	7,076	7,076
Equity instruments	18,146	2,412	20,558
Debt securities	27,133	9,809	36,942
Collateralised financing transactions	—	172,189	172,189
Other assets	19,634	265,393	285,027
Total	64,913	456,879	521,792
Collateral Received			
Equity instruments	42,978	2,094	45,072
Debt securities	194,405	49,096	243,501
Other collateral received	—	13,088	13,088
Total	237,383	64,278	301,661

2021	Encumbered $ Million	Non-encumbered $ Million	Total $ Million
Assets			
Cash at bank and in hand	—	8,463	8,463
Equity instruments	18,535	2,455	20,990
Debt securities	39,918	3,843	43,761
Collateralised financing transactions	—	158,563	158,563
Other assets	21,560	197,944	219,504
Total	80,013	371,268	451,281
Collateral Received			
Equity instruments	45,819	1,430	47,249
Debt securities	245,692	34,585	280,277
Other collateral received	—	14,983	14,983
Total	291,511	50,998	342,509

22. Deferred tax asset

The movement in deferred tax in the year is as follows:

	2022 $ Million	2021 $ Million
At 1 January	337	251
Deferred tax movement related to IFRS 9 adjustments	—	—
Income statement movement relating to deferred tax	(28)	79
Deferred tax movement in equity	(126)	7
At 31 December	183	337

Deferred tax is recognised on the Company's temporary differences as it is considered probable that taxable profits will arise against which these can be utilised. The deferred tax asset is recognised at the tax rates at which the temporary differences are expected to reverse.

There is also a deferred tax liability of $86 million on the pension asset which is reflected in Note 8 Pension.

22. Deferred tax asset (continued)

The deferred tax asset in the balance sheet comprises:

	2022 $ Million	2021 $ Million
Accelerated tax depreciation	20	5
Deferred compensation	211	277
DVA in OCI	(44)	61
Provisions and other temporary differences	(4)	(6)
	183	337

The deferred tax movement in the income statement comprises:

	2022 $ Million	2021 $ Million
Accelerated tax depreciation	(15)	11
Deferred compensation	18	(84)
Provisions and other temporary differences	25	(6)
	28	(79)

The deferred tax movement in equity comprises:

	2022 $ Million	2021 $ Million
DVA in Statement of comprehensive income	103	(7)
Share based payment transactions in Equity reserve	23	—
	126	(7)

23. Other Liabilities

The following amounts are included within Other Liabilities. Included within 'Other creditors and accruals' is the accrual in respect of the bank levy.

	2022 $ Million	2021 $ Million
Cash collateral held	62,682	27,948
Trade creditors	12,087	16,392
Other creditors and accruals	4,569	2,079
Payroll taxes	74	72
Corporation tax payable	—	—
Deferred tax liability on pensions (Note 8)	86	181
Provisions for liabilities and charges (Note 24)	84	40
	79,582	46,712

Trade Creditors includes customer margin trading payables, securities trading payables outside standard settlement and other brokerage payables.

23. Other Liabilities (continued)

Included within Other Liabilities are the following balances due to other Citi affiliates:

	2022 $ Million	2021 $ Million
Cash collateral held	3,365	2,015
Trade creditors	3,287	5,053
Other creditors and accruals	2,636	212
	9,288	7,280

24. Provisions for liabilities

	Restructuring provision $ Million	Litigation provisions $ Million	Other provisions $ Million	Total $ Million
At 1 January 2022	7	28	5	40
Charge to profits	23	53	—	76
Provisions utilised	(15)	(9)	(5)	(29)
Exchange adjustments	(1)	(2)	—	(3)
At 31 December 2022	14	70	—	84

For reasons of privilege and confidentiality, no further information is disclosed in respect of the litigation provision. Notwithstanding, Citigroup Inc. files periodic reports with the U.S. Securities and Exchange Commission ("SEC") as required by the Securities Exchange Act 1934 which include details of any material regulatory proceedings, investigations and litigations concerning Citigroup and its subsidiaries. Copies of Citigroup's reports are on file with the SEC and are available at http://www.citigroup.com/citi/investor/sec.htm. Other provisions are held in respect of accounting reconciliation and control procedures as part of the balance sheet substantiation process.

25. Derecognition of financial assets and financial liabilities

Transferred financial assets that are not derecognised in their entirety

There are certain instances where the Company continues to recognise financial assets that it has transferred.

CGML enters into collateralised financing transactions where it sells or lends debt or equity securities with a concurrent agreement to repurchase them. As significantly all of the risks and rewards of the underlying securities are retained, a collateralised financing liability is recognised and the securities remain on balance sheet. As at 31 December 2022, the Company recognised $18 billion of assets (2021: $35 billion), with an associated $26 billion of collateralised financing liabilities (2021: $33 billion).

CGML also enters into collateralised financing transactions where it sells debt or equity securities and simultaneously undertakes a swap transaction for the same underlying instrument. As significantly all of the risks and rewards of the underlying securities are retained, a collateralised financing liability is recognised and the securities remain on balance sheet. As at 31 December 2022 the Company recognised $1,114 million of inventory (2021: $335 million) with associated collateralised financing liabilities of $1,114 million (2021: $341 million) for transactions of this nature.

26. Trading financial assets and liabilities

Any initial gain or loss on financial instruments where valuation is dependent on techniques using unobservable parameters is deferred over the life of the contract or until the instrument is redeemed, transferred, or sold or the fair value becomes observable. In case the transaction price in the market in which these transactions are undertaken is different from the fair value in the Company's principal market for those instruments, the fair value of these transactions are also estimated by using valuation techniques.

The table below sets out the aggregate difference yet to be recognised in profit or loss at the beginning and end of the year with a reconciliation of the changes of the balance during the year for those financial assets and liabilities classified as trading.

	2022 $ Million	2021 $ Million
Unamortised balance at 1 January	159	41
Deferral on new transactions	341	160
Recognised in the income statement during the period:		
– amortisation	(218)	(42)
Unamortised balance at 31 December	282	159

27. Subordinated loans

The subordinated loans form part of the Company's regulatory capital resources held to meet its capital and minimum eligible liability requirements. The loans, on which interest is payable at market rates on quarterly basis, are due to other group undertakings. The following amounts were included within subordinated loans:

Subordinated Loans	Currency	$ Million	Weighted Average Interest Rate	Weighted Average Maturity (Years)
31 December 2022	USD	11,100	6.49%	8.35
31 December 2021	USD	8,600	2.14%	7.40

As at 31 December 2022, subordinated loans consists of a) $8,500 million (2021: $6,000) of Minimum Requirements for Own Funds and Eligible Liabilities (MREL) eligible subordinated loans (MREL loans) from Citicorp LLC and b) $2,600 million of Tier 2 subordinated loans (Tier 2 loans) from Citicorp LLC.

On 4 March and 9 September 2022 CGML issued $1,000 and $1,500 million of MREL loans to Citicorp LLC (2021: $2,000).

The MREL loans rank as senior subordinated claims, which are subordinate to the claims of senior creditors, but rank ahead of Own Funds Instruments, which comprise Common Equity Tier 1 instruments, Additional Tier 1 instruments (see Note 28) and Tier 2 instruments.

The Tier 2 loans rank as subordinated claims, which are subordinated to senior creditors and MREL loans but rank ahead of Common Equity Tier 1 instruments and Additional Tier 1 instruments.

In the event that the Company's Own Funds Instruments have been written down, or if the Company or certain of its direct or indirect parent entities are subject to Resolution Proceedings in the UK or elsewhere, then all or a portion of the subordinated loans and/or interest on them shall be reduced or cancelled as instructed by the UK Resolution Authority (Bank of England).

There are no other circumstances under which early repayment may be demanded by the lender.

28. Capital and reserves

(a) Called up share capital

CGML's share capital comprises:

	2022	2021
Allotted, called-up and fully paid:	**$ Million**	**$ Million**
19,998,975,176 ordinary shares of a par value of $1 each	19,999	19,999
	19,999	19,999

The shares have attached to them full voting, dividend and capital distribution (including on winding up) rights. They do not confer any rights of redemption.

(b) Other equity instruments

On 16 September 2021, the Company issued $2,000 million of Additional Tier 1 Notes to Citicorp LLC, another Citi entity. There were no new issuances in 2022. As at 31 December 2022 and 2021, the other equity instruments of CGML consist of a) $2,000 million of Additional Tier 1 Notes to Citicorp LLC b) $2,300 million of Additional Tier 1 Notes to Pipestone LLC, another Citi entity.

The notes are perpetual with no fixed redemption date, and are redeemable at the issuer's option subject to approval from the PRA. Interest is fixed every 5 years, interest payments are not cumulative and the issuer may cancel any interest payment at its sole discretion. The notes do not confer any voting rights.

In the event that CGML's Common Equity Tier 1 (CET1) ratio falls below 7.0%, the notes will be written down to zero. If a winding up occurs under these circumstances, no payment will be made to the noteholders. If a winding up takes place under any other circumstances, the noteholders will rank *pari passu* with the holders of the most senior class(es) of preference shares (if any) and ahead of all other classes of issued shares, but junior to the claims of senior creditors, for the amount of the principal and any accrued but unpaid interest on the notes.

(c) Capital reserve

There were no changes in the structure of the Company's capital reserves in 2022. During 2021, CGML received $5.5 billion from its parent, Citigroup Global Markets Holdings Bahamas Limited (CGMHBL).

29. Financial instruments and risk management

Risk Management Overview and Culture

For Citi, effective risk management is of primary importance to its overall operations. Accordingly, the Company's risk management process has been designed to monitor, evaluate and manage the principal risks it assumes in conducting its activities. Specifically, the activities that the Company engages in, and the risks those activities generate, must be consistent with Citi's mission and value proposition, the key principles that guide it and the Company's risk appetite.

Citi's Culture and Values drive a strong risk and control environment and are at the heart of our risk frameworks , underpinning the way Citi conducts business. It consists of the shared attitudes, values and expected behaviours that promote open discussions and decisions in line with Citi's Strategy, Mission, Value Proposition, Leadership Principles and Risk Appetite. Citi's Company-wide risk governance framework consists of the key policies, standards and processes through which Citi identifies, assesses, measures, monitors and controls risks across the Company. CGML adopted and follows Citi's globally set policies, tailored as appropriate for the Company. It also emphasises Citi's risk culture and lays out standards, procedures and programmes that are designed to set, reinforce and enhance the Company's risk culture, integrate its values and conduct expectations into the organisation, providing employees with tools to assist them with making prudent and ethical risk decisions and to escalate issues appropriately.

Citi selectively takes risks in support of its underlying customer-centric strategy. Citi's objective is to ensure that those risks are consistent with its mission and value proposition and principle of responsible finance; that they are identified, assessed, measured, monitored, and controlled; and that they are captured in Citi's risk/reward assessment.

While the management of risk is the collective responsibility of all employees, Citi and the Company assign accountability into three lines of defence:

- first line of defence: the business owns all of its risks and is responsible for the management of those risks;
- second line of defence: the Company's independent Risk and Compliance functions establish standards for the management of risks and effectiveness of controls; and
- third line of defence: Citi's Internal Audit function independently provides assurance, based on a risk-based audit plan, that processes are reliable and governance and controls are effective.

The Company applies Citi's global risk management framework, tailored as appropriate for the Company, based on the following principles established by the Chief Risk Officer:

- a defined risk appetite, aligned with business strategy;
- accountability through a common framework to manage risks;
- risk decisions based on transparent, accurate and rigorous analytics;
- a common risk capital model to evaluate risks;
- expertise, stature, authority and independence of risk managers; and
- risk managers empowered to make decisions and escalate issues.

29. Financial instruments and risk management (continued)

Risk Appetite Framework

The Company's risk capacity and risk appetite framework includes principle-based qualitative boundaries to guide behaviour and quantitative boundaries within which the Company will operate, focusing on ensuring it has sufficient capital resources for the risks to which the Company could be exposed. The Company's Board of Directors sets the Company's risk capacity and risk appetite, and incorporates management judgement regarding prudent risk taking and growth in light of the business environment within which the Company operates.

Risk Appetite Framework (continued)

The Company's Board of Directors, with input from senior Citi and Company management, sets overarching expectations and holds management accountable for ensuring the risk profile remains within this appetite.

CGML Risk Committee

The CGML Risk Committee assists the Board in fulfilling its responsibility for oversight of the risks the Company faces including, but not limited to, market, liquidity, credit, and operational risks; their alignment with the Company's strategy, capital adequacy and the macroeconomic environment; and the development of a strategy to manage these risks. The CGML Risk Committee meets at a minimum quarterly.

Managing Risk across Businesses, Regions, Products and Legal entities

Citi manages risk across four dimensions: businesses, regions, products and legal entities. The Company's risk management framework aims to recognise the range of the Company's global business activities by combining corporate oversight with independent risk management functions within each business.

CGML utilises Citi's overarching risk management model and organisation, with its multi-dimensional risk oversight, people, processes and systems in order to ensure robust oversight of entity risks. In addition, CGML has developed entity specific risk management and controls detailed in CGML's Risk Management Framework, to ensure that there is local challenge to risk taking and that Citi's approach is appropriate for CGML. The EMEA Chief Risk Officer (CRO) is the UK Senior Manager for Risk and together with the UK CRO and other Risk senior management delegates are responsible for the independent review and challenge of the risks facing CGML, including market risk, counterparty credit risk, credit risk, operational risk and liquidity risk. With respect to Compliance Risk, CGML has a dedicated Compliance Officer with direct access to the Board and Board Risk and Audit Committee members. The CGML Compliance Officer also has a matrix reporting line to the EMEA Chief Compliance Officer who is the UK Senior Manager for Compliance.

CGML has through its Risk Management Framework and escalation guidelines developed protocols and processes for prompt and consistent escalation of matters or issues across both financial and non-financial risk types. The early recognition, escalation and resolution of issues or concerns is key to mitigate risks and is critical to CGML's business model. Timely escalation enables the UK Senior Managers to make informed assessment on the legal entity impact, underlying root causes and required corrective actions. In addition to the timely escalation protocols and process, CGML also has an integrated series of committees across the risk types, that comprises both first line business and second line expertise in their memberships in order to provide oversight of the management and escalation of risks to both the CGML Risk Committee and the CGML Board.

Risk Aggregation and Stress Testing

The Citi Chief Risk Officer is responsible for monitoring and controlling major risk exposures and concentrations across the organisation. This means aggregating risks, within and across businesses, as well as subjecting those risks to alternative stress scenarios in order to assess the potential economic impact they may have on Citi. This aggregation is also performed at a Company level under the accountability of the Company's CRO.

29. Financial instruments and risk management (continued)

Risk Aggregation and Stress Testing (continued)

Stress tests are undertaken across Citi and the Company and cover mark-to-market, available-for-sale, and amortised cost portfolios. These firm-wide stress reports seek to measure the potential impact to Citi, the Company and its component businesses, of stresses such as the risk of very large movements in a number of key risk factors (e.g. interest rates, credit spreads, equities, commodities prices), as well as the potential impact of a range of historical and hypothetical forward-looking systemic stress scenarios.

Supplementing the stress testing described above, risk management works with input from the businesses and finance to provide periodic updates to senior management and the Company's Board of Directors on significant potential exposures across the Company arising from risk concentrations, financial market participants and other systemic issues. These risk assessments are forward-looking exercises, intended to inform senior management and the Board of Directors about the potential economic impacts to the Company that may occur, directly or indirectly, as a result of hypothetical scenarios, based on judgmental analysis from independent risk managers.

Market Risk

Market risk is the risk of loss arising from changes in the value of Citi's assets and liabilities resulting from changes in market variables, such as interest rates, exchange rates, equity and commodity prices or credit spreads.

Price risk equates to Market Risk (Trading), as defined above, plus the Financial Statement Reporting Risks associated with independent price verification and profit attribution analysis.

The Company's derivative transactions are principally carried out in equity, interest rate, credit, FX and commodity markets.

Market risk is assessed and quantified through a complementary set of tools, including factor sensitivities, Value at Risk (VaR), Stressed VaR (SVaR) and stress testing.

The Stress Testing process for Market Risk (Trading) is classified into 2 key categories:

- Global Systemic Stress Testing (GSST) – top-down systemic stresses; and
- Business Specific Stress Testing (BSST) – bottom-up business specific stresses.

Both categories of stress testing can be based upon either a range of historical periods of market stress or purely hypothetical future market events.

GSSTs are designed to quantify the potential impact of extreme market movements on a firm-wide basis and are constructed using both historical periods of market stress and hypothetical projections of adverse economic scenarios.

BSSTs are developed in response to Business tailored or market specific concerns and are performed periodically. Such stress scenarios are usually idiosyncratic in nature and are designed to probe the risks of each specific portfolio, particularly risks that are not fully captured by other measures like VaR or GSST.

Stress testing is performed regularly to help identify and quantify the impact of extreme market movements. Stress testing is performed on both individual portfolios, as well as on aggregations of portfolios and businesses, as appropriate. It is the responsibility of independent market risk management, in conjunction with the business, to develop stress scenarios, review the output of periodic stress testing exercises, and use the information to make judgments concerning the on-going suitability of exposure levels and limits.

In addition, the Company has a defined risk appetite framework which is supplemented by regular stress testing and daily monitoring against predefined limits with daily reporting to the UK CRO and senior management and quarterly reporting to the Board of Directors.

29. Financial instruments and risk management (continued)

Market Risk (continued)

Each business that uses the Company in client-facing transactions is required to establish, with approval from the independent market risk management function, a market risk limit framework for identified risk factors. This framework must clearly define approved risk profiles, include permitted product lists, and must remain within the parameters of the overall market risk appetite. The established limits are monitored by market risk management. Exposure that approaches or exceeds limit or trigger levels is escalated within market risk management and to the Company's Market Risk Manager and UK CRO, with necessary actions taken.

In all cases, the businesses are responsible for the market risks taken and for remaining within their approved market risk limit framework. Management of this process begins with the employees who work most closely with the Group's customers, products and markets and extends up to the senior executives who manage these businesses with a complementary aggregation up to the country level.

The following types of transactions are also subject to pre-trade market risk approvals where they meet the criteria in the associated policies and procedures below:

- Equity and Debt capital market transactions in conformance with the ICG Global Commitment Committee Policy and Procedures.
- Non-recourse collateralised financings in conformance with the ICG Convergence Risk Guidelines and Procedures for Collateralised Financing Transactions.
- Transactions considered as large, complex and illiquid in conformance with the Citi Standard for Pre-Trade Approval of Large, Complex and Illiquid Trades.

Transactions with estimated stress losses above defined levels require escalation to UK Chief Risk Officer, EMEA Chief Risk Officer, the Company's Chief Executive Officer and to the Company's board.

Company's VaR reports are circulated daily for monitoring of the VaR usage against the overall VaR limit. As well as an overall VaR limit, the Company has factor sensitivity limits and trigger levels in place for each market risk factor that are monitored daily. Factor sensitivities are defined as the change in the value of a position for a defined change in a market risk factor (e.g. the change in the value of a Treasury bill for a one basis point change in interest rates). It is the responsibility of each business to seek to ensure that factor sensitivities are calculated and reported for all relevant risks taken within a trading portfolio.

VaR Methodology

VaR is the estimate of the potential decline in the value of a position or a portfolio under normal market conditions, within a defined confidence level, and over a specific time period. Citi uses a three year look back period for correlations between risk factors and the greater of three-year or, in most instances, effectively 30-day volatility. These market risk factors include material first and second-order risk sensitivities of various asset classes/risk types (such as interest rate, credit spread, foreign exchange, equity, and commodity risks). Citi uses a single, independently approved Monte Carlo simulation VaR model. The Monte Carlo simulation involves approximately 450,000 market factors, making use of approximately 350,000 time series, with sensitivities updated daily, volatility parameters updated intra-month and correlation parameters updated monthly. Citi's confidence interval is 99% and uses a 1-day time horizon in its management reporting.

VaR Limitations

Although extensive back-testing of VaR hypothetical portfolios is performed, with varying concentrations by industry, risk rating and other factors, the VaR measure cannot necessarily provide an indication of the potential size of loss when it occurs. Hence a varied set of factor sensitivity limits and stress tests are used, in addition to VaR limits.

A VaR limit is in place for the Company, to ensure that any excesses are discussed and resolved between risk officers, the business and entity management. This limit is complemented by the factor sensitivity limits or triggers referred to above.

29. Financial instruments and risk management (continued)

Stressed VaR (continued)

Although it provides a valuable guide to risk, VaR should also be viewed in the context of its limitations:

- the use of historical data as a proxy for estimating future events may not encompass all potential events, particularly those of an extreme nature;
- the use of a one day holding period assumes that all positions can be liquidated or their risks offset in one day. This may not fully reflect the market risk arising at times of severe illiquidity, when a one day holding period may be insufficient to fully liquidate or hedge positions;
- the use of a 99% confidence level, by definition, does not take into account losses that might occur beyond this confidence level;
- VaR is calculated on the basis of exposures outstanding at close of business and therefore does not necessarily reflect intra-day exposures; and
- VaR is unlikely to reflect loss potential on exposures that only arise under significant market movements.

Stressed VaR

Stressed Value-at-Risk is a VaR-based risk measure subject to the same confidence level and holding period applicable to the VaR-based measure, but with model inputs calibrated to historical data from a continuous 12-month period that reflects a period of significant financial stress appropriate to the firm's current portfolio. SVaR, like VaR, is produced daily with the selection of stress period for SVaR being evaluated at least quarterly.

Market Risk Analytics, Risk Data Governance and Management, and the Market Risk Managers are jointly responsible for overseeing the production of the SVaR calculations and are ultimately responsible for ensuring their integrity.

The following table summarises market risk by disclosing the Company's average Economic VaR during the reporting period on a month-end basis, together with the VaR as at 31 December, broken down into component Value at Risk (CVaR). CVaR represents the correlation or diversification adjusted standalone VaR contribution from a particular sub-portfolio.

	2022 $ Million					
	Equity risk	**Interest rate risk**	**Foreign exchange risk**	**Commodity risk**	**Credit risk**	**Overall VaR**
Average	14.4	10.4	1.2	5.8	7.4	39.2
As at 31 December	19.1	6.9	1.1	3.7	9.9	40.7
Peak	28.0	21.2	5.1	17.2	15.7	54.6

	2021 $ Million					
	Equity risk	**Interest rate risk**	**Foreign exchange risk**	**Commodity risk**	**Credit risk**	**Overall VaR**
Average	19.3	9.9	0.7	2.8	6.7	39.4
As at 31 December	22.5	7.8	2.4	2.7	7.8	43.2
Peak	36.3	22.4	3.2	13.6	13.5	54.6

29. Financial instruments and risk management (continued)

Liquidity risk

Liquidity risk is defined as the risk that the firm will not be able to efficiently meet both expected and unexpected current and future cash flow and collateral needs without adversely affecting either daily operations or the financial condition of the firm.

Citi operates a centralised treasury model, whereby the overall balance sheet is managed by Corporate Treasury through its Global Franchise and Regional and Country Treasurers. The EMEA Regional Treasurer is supported by the UK Treasurer who is responsible for the UK legal vehicles balance sheets and liquidity profile as well as those of CGML's subsidiaries.

The UK Treasurer heads the UK Legal Entity Treasury and Markets Business Treasury group, which is responsible for managing CGML's liquidity on a day-to-day basis.

The UK Legal Entity Treasury team is specifically responsible for the CGML's daily funding, liquidity risk management including intraday liquidity, liquidity stress testing, and providing oversight to the Fixed Income and Equity Finance desks including setting and monitoring limits.

The Legal Entity Treasury team in London is also responsible for managing the relationship with internal and external stakeholders. Internal stakeholders consist of Citi's senior management and Governance committees, the Finance desks, and New York Treasury. External stakeholders comprise of auditors, credit rating agencies and regulatory authorities. This team also provides oversight and governance to the teams in Budapest and Mumbai, to ensure adherence to the overall liquidity risk management framework.

CGML follows the Global standard liquidity operating framework or the liquidity stress continuum for managing liquidity integrating exit from business-as-usual to Stress and Recovery and Resolution as part of one holistic management framework.

A combination of metric monitoring, limits, triggers, and stress testing are utilised to identify, measure, monitor and manage liquidity risk arising from various sources. Limits and triggers are used to control risks and stress assumptions are used to calibrate the level of adequate liquidity buffer under different stress scenarios. To provide for resilience under stress, CGML holds a buffer of high-quality liquid assets, which is comprised predominantly of US, European and UK government bonds.

Global Liquidity Management ('GLM') provides first line of defence oversight of Citi's liquidity management framework in order to ensure compliance to Liquidity Risk Management Policy. The individual business lines and Corporate Treasury are first line of defence for liquidity risk within CGML, while second line oversight is provided by Finance CRO. The UK Asset and Liability Committee ('ALCO') is the primary governance committee for liquidity management. Oversight is provided by the UK Executive Committee, CGML Risk Committee and the Board.

Funding and Liquidity Objectives

Adequate liquidity and sources of funding are essential to Citi's businesses. Funding and liquidity risks arise from multiple factors, many of which are beyond Citi's direct control, such as disruptions in the financial markets, changes in key funding sources, credit spreads, alterations to Citi's credit ratings and political and economic conditions across the globe.

Citi's funding and liquidity objectives are to maintain adequate liquidity to:

(i) fund its existing asset base;

(ii) grow its core businesses;

(iii) maintain sufficient excess liquidity, structured appropriately, to enable operation under a wide variety of market conditions, including both short and long-term market disruptions; and

(iv) satisfy regulatory requirements.

29. Financial instruments and risk management (continued)

Liquidity risk (continued)

These Citi-wide primary liquidity objectives have been adopted by CGML and approved as part of the Liquidity Risk Management Policy.

CGML funds itself through a combination of equity, long-term subordinated debt, long-term and short- term unsecured intercompany borrowings, short-term unsecured third-party borrowings ('BVU'), structured notes through CGMFL and secured financing. Long-term structural liquidity is formed of subordinated debt, stockholder's equity, and greater than 1 year to maturity intercompany loans. Day-to-day funding fluctuations are managed through short-term intercompany loans from Citicorp LLC.

Citigroup employs a 'single face to the market' approach for long-term benchmark unsecured borrowing. The long-term funding is down streamed to CGML from several funding sources. Long-term group borrowings and capital are considered stable given the nature of these sources. Senior unsecured and Subordinated debt is drawn from Citicorp LLC and subject to approved intercompany extension of credit agreements.

In order to meet its internal liquidity-related stress testing requirements and ratios, the Company holds a pool of liquid assets including highly liquid government bonds. This asset pool is reviewed on a daily basis and adjusted as necessary to maintain CGML's key liquidity ratios and metrics within the Board approved risk appetite. Increases to the asset pool are typically funded through increased intercompany unsecured long-term borrowing.

Liquidity Risk Management Framework

The Company's liquidity risk management framework is defined by Citi's Global Liquidity Risk Management Policy (the Policy), which is owned by the Citi Treasury Chief Risk Officer and is applicable to Citigroup Inc. and its consolidated subsidiaries. Key aspects of the global framework include liquidity risk appetite, measurement, limit and trigger setting, planning and monitoring. The Policy and any material amendments to it must be approved by the Citigroup Board of Directors.

The UK ALCO is the primary governance committee for CGML's balance sheet management and reviews the current and prospective funding requirements for the Company, as well as the capital position and statement of financial position. Among its key responsibilities are:

- Drive efficient and prudential Balance Sheet trends and mix;
- Oversee and influence liquidity levels, structure, and metrics;
- Influence investment allocation of the liquidity pool in High Quality Liquid Assets;
- Review and approve the summary Annual Funding and Liquidity Plan, CFP and frequency of intraday liquidity monitoring;
- Set and monitor liquidity and non-trading market risk limits and triggers;
- Formulate recommendations regarding dividends, capital infusions and other capital management;
- Oversee prudent interest rate and foreign exchange risk positions of the non-trading book; and
- Review and approve transfer pricing processes including approvals of deposit Beta and transfer pricing vectors.

29. Financial instruments and risk management (continued)

Liquidity risk (continued)

Citi's UK management team and the UK ALCO monitor changes in the economic environment and any corresponding impact on the asset quality of Citi's local and consolidated balance sheets, including CGML. The UK ALCO also functions as a forum for senior management to ensure adherence to corporate wide policies and procedures, regulatory requirements, and rating agency commitments.

The membership of the UK ALCO includes the UK Citi Country Officer (CCO) and CGML Chief Executive Officer (CEO) (chair), UK Country Finance Officer (CFO), UK Treasurer, UK Chief Risk Officer, Independent Liquidity Risk Manager, Finance Desk Heads and other key business and functional heads.

The UK ALCO meets on a monthly basis. Items of critical importance are escalated from ALCO to UK ExCo at the discretion of the chair and from ExCo to the Board.

The ultimate responsibility for liquidity rests with the Board. CGML's Board reviews Citi's Liquidity Risk Management Policy and the Company's Internal Liquidity Adequacy Assessment Process (ILAAP) document and approves the Liquidity Risk Appetite Framework, the Funding and Liquidity Plan, the Contingency Funding Plan, and any relevant CGML-specific liquidity policies.

Liquidity Risk Measurement

Liquidity risk metrics allow the Company to measure and monitor the key drivers of liquidity risk on a current and forward looking basis. Stress metrics are a key tool for measurement of liquidity risk. The Company's use of stress testing and scenario analysis is intended to quantify the potential impact of a liquidity stress event on the Company's balance sheet and liquidity position, and to identify viable funding alternatives that can be utilised. These scenarios include:

- potential significant changes in key funding sources;
- market triggers (such as credit rating downgrades);
- changes to uses of funding; and
- political and economic conditions, including stressed market conditions as well as Company-specific events.

Some tests span liquidity events over a full year, while others may cover a more intense shock over a shorter period such as 30 days. These tests incorporate all material risks and can identify potential mismatches between liquidity sources and uses over a variety of time horizons, allowing Treasury to manage liquidity risk within the stress horizons. The stress tests and potential mismatches may be calculated with varying frequencies, with several important tests performed daily. They are also performed for the material currencies that constitute CGML's balance sheet.

The company conducts both PRA required stress tests (Liquidity Coverage Ratio ("LCR") and Net Stable Funding Ratio ("NSFR")) and Citi's enterprise-wide internal stress tests (Resolution Liquidity Adequacy and Positioning ("RLAP") and Term Liquidity Stress Test ("TLST")) to appropriately reflect Citi's business model and internal liquidity risk management. The two main internal scenario-based liquidity risk metrics are:

- RLAP: Internal stress test metric used to measure the short-term (30-days) survival horizon under a Severe Market Disruption Stress Scenario. The Policy requires CGML to maintain self-sufficiency or a minimum of $0 surplus in each day within the 30-day horizon. Monitoring must be performed daily.
- TLST: Citi's longer-term (1-year) and comparatively less severe (as against RLAP) Internal Liquidity Stress Tests (ILST) where the firm's long and short-term ratings are assumed to be downgraded by two notches and one notch, respectively, from current levels and the firm is expected to continue to operate as a going concern. The Policy requires CGML to maintain self-sufficiency or a minimum of $nil surplus under TLST in each tenor bucket within the 12-month horizon. Monitoring must be performed daily.

Stress metrics are supplemented by internally developed concentration metrics that allow for comprehensive management of funding risks beyond stress horizons.

29. Financial instruments and risk management (continued)

Liquidity risk (continued)

Maturity analysis of financial instruments

The following table assigns the Company's assets and liabilities to a combination of the relevant contractual and/or behavioural maturity groupings based on the remaining period from the balance sheet date. It should be noted that in managing liquidity risk, management uses certain assumptions based on a combination of contractual and behavioural maturity profiles, as shown below. The majority of the financial instruments disclosed below are presented on a contractual basis, with the exception of derivatives, inventory and securities sold but not yet purchased. Due to the nature of the business, behavioural maturity is considered the best reflection of the liquidity of these financial instruments.

31 December 2022	Total $ Million	On demand $ Million	3 months & less $ Million	3 - 12 months $ Million	1 – 5 years $ Million	More than 5 years $ Million
Cash	7,076	7,076	—	—	—	—
Collateralised financing transactions at amortised cost	91,817	72,607	4,864	14,346	—	—
Derivatives	197,965	—	197,965	—	—	—
Inventory	57,500	57,500	—	—	—	—
Collateralised financing transactions at fair value	80,372	33,891	41,637	3,952	892	
Equity securities held for investment	122	—	—	—	—	122
Cash collateral pledged	65,000	—	65,000	—	—	—
Trade debtors	15,881	—	15,881	—	—	—
Other debtors	644	—	644	—	—	—
Total financial assets	516,377	171,074	325,991	18,298	892	122

	Total $ Million	On demand $ Million	3 months & less $ Million	3 - 12 months $ Million	1 – 5 years $ Million	More than 5 years $ Million
Bank loans and overdrafts	10,644	1,144	1,000	5,000	1,500	2,000
Collateralised financing transactions at amortised cost	62,240	37,963	6,359	17,513	405	—
Derivatives	198,725	—	198,725	—	—	—
Securities sold but not yet purchased	52,347	—	52,347	—	—	—
Collateralised financing transactions at fair value	52,123	15,861	30,008	5,286	968	—
Hybrid financial liabilities	26,311	—	1,738	3,812	10,541	10,220
Cash collateral held	62,682	—	62,682	—	—	—
Trade creditors	12,080	—	12,080	—	—	—
Other creditors and accruals	2,196	—	2,196	—	—	—
Subordinated loans	11,100	—	—	—	1,000	10,100
Total financial liabilities	490,448	54,968	367,135	31,611	14,414	22,320
Net liquidity gap	25,929	116,106	(41,144)	(13,313)	(13,522)	(22,198)
Cumulative liquidity gap		116,106	74,962	61,649	48,127	25,929

29. Financial instruments and risk management (continued)

31 December 2021	Total $ Million	On demand $ Million	3 months & less $ Million	3 - 12 months $ Million	1 – 5 years $ Million	More than 5 years $ Million
Cash	8,463	8,463	—	—	—	—
Collateralised financing transactions at amortised cost	76,862	47,764	5,589	23,509	—	—
Derivatives	157,281	—	157,281	—	—	—
Inventory	64,751	64,751	—	—	—	—
Collateralised financing transactions at fair value	81,701	40,677	34,973	5,203	848	
Equity securities held for investment	106	—	—	—	—	106
Cash collateral pledged	35,263	—	35,263	—	—	—
Trade debtors	21,160	—	21,160	—	—	—
Other debtors	376	—	376	—	—	—
Total financial assets	445,963	161,655	254,642	28,712	848	106

	Total $ Million	On demand $ Million	3 months & less $ Million	3 - 12 months $ Million	1 – 5 years $ Million	More than 5 years $ Million
Bank loans and overdrafts	7,201	1,671	1,025	1,505	500	2,500
Collateralised financing transactions at amortised cost	63,067	28,490	6,619	25,363	2,595	—
Derivatives	161,797	—	161,797	—	—	—
Securities sold but not yet purchased	65,997	—	65,997	—	—	—
Collateralised financing transactions at fair value	43,245	16,636	20,473	4,994	1,142	—
Hybrid financial liabilities	26,143	—	4,334	4,674	8,280	8,855
Cash collateral held	27,948	—	27,948	—	—	—
Trade creditors	16,385	—	16,385	—	—	—
Other creditors and accruals	2,044	—	2,044	—	—	—
Subordinated loans	8,600	—	—	—	1,500	7,100
Total financial liabilities	422,427	46,797	306,622	36,536	14,017	18,455
Net liquidity gap	23,536	114,858	(51,980)	(7,824)	(13,169)	(18,349)
Cumulative liquidity gap		114,858	62,878	55,054	41,885	23,536

29. Financial instruments and risk management (continued)

The table below assigns the Company's liabilities to relevant maturity groupings based on the remaining contractual future undiscounted cash flows up to maturity. The amounts disclosed in the table are the contractual undiscounted cash flows, whereas the Company manages liquidity risk based on a combination of contractual and behavioural maturity profiles. Derivatives are excluded from the table as these are held for trading purposes. As such, the intention is not to hold these positions to settlement over the period of contractual maturity. Cash collateral held, securities sold not yet purchased, trade creditors, and other creditors and accruals are excluded because they are deemed to be three months or less and are thus very short term.

31 December 2022	Contractual value $ Million	On demand $ Million	3 months & less $ Million	3 - 12 months $ Million	1 – 5 years $ Million	More than 5 years $ Million
Bank loans and overdrafts	12,235	1,145	1,127	5,285	2,230	2,448
Collateralised financing transactions at amortised cost	62,356	37,964	6,371	17,604	417	—
Collateralised financing transactions at fair value	52,488	15,863	30,107	5,442	1,076	—
Hybrid financial liabilities	31,115	—	1,745	3,898	11,385	14,087
Subordinated loans	17,181	—	180	540	3,869	12,592
Total financial liabilities	175,375	54,972	39,530	32,769	18,977	29,127

31 December 2021	Contractual value $ Million	On demand $ Million	3 months & less $ Million	3 - 12 months $ Million	1 – 5 years $ Million	More than 5 years $ Million
Bank loans and overdrafts	7,427	1,671	1,037	1,530	616	2,573
Collateralised financing transactions at amortised cost	63,074	28,489	6,619	25,364	2,602	—
Collateralised financing transactions at fair value	43,255	16,635	20,454	5,017	1,149	—
Hybrid financial liabilities	31,398	—	4,343	4,791	9,023	13,241
Subordinated loans	9,853	—	46	138	2,156	7,513
Total financial liabilities	155,007	46,795	32,499	36,840	15,546	23,327

Credit risk

Credit risk is the potential for financial loss resulting from the failure of a borrower or counterparty to honour its financial or contractual obligations.

Credit risk arises in many of the Company's business activities, including:

- sales and trading in securities and derivatives;
- settlement;
- when Citi acts as an intermediary on behalf of its clients and other third parties; and
- when acting as underwriter or within a capital raising capacity.

Credit risk arises from the Company's activities in OTC derivatives and repurchase and reverse repurchase agreements, as well as securities lending and margin lending transactions. The Company's credit exposure is primarily to professional counterparties in the global financial sector, including banks, investment banks, hedge funds, insurance companies and asset management companies, and the public sector and corporates.

29. Financial instruments and risk management (continued)

Credit risk (continued)

The Company enters into derivative transactions principally to enable customers to transfer, modify or reduce their credit, equity, interest rate and other market risks. In addition, the Company uses derivatives, and other instruments, as an end user to manage the risks to which the Company is exposed. Credit risk also arises from settlement and clearing activities when the Company transfers an asset in advance of receiving its counter-value or advances funds to settle a transaction on behalf of a client. Concentration risk, within credit risk, is the risk associated with having credit exposure concentrated on a specific client, industry, region, or other category.

Credit risk is one of the most significant risks the Company faces as an institution. As a result, Citi has a well-established framework in place for managing credit risk across all businesses. This includes a defined risk appetite, credit limits and credit policies, both at the business level as well as at the firm-wide level. Citi's credit risk management also includes processes and policies with respect to problem recognition, including "watch lists," portfolio review, updated risk ratings and classification triggers. The framework is supplemented by regular stress testing and monitoring of exposures, with monthly and quarterly reporting to senior management and the Board of Directors respectively.

The Company has in place a concentration risk management framework which includes risk limits by relationship, country, and industry.

The credit process is based on a series of fundamental policies, including:

- joint business and independent risk management responsibility for managing credit risks;
- a single centre of control for each credit relationship to coordinate credit activities with that client;
- a requirement for a minimum of two authorised credit officer signatures on extensions of credit, one of which must be from a sponsoring credit officer in the business and the other from a credit officer in independent credit risk management;
- consistent risk rating standards, applicable to every Citi obligor and facility;
- consistent standards for credit origination documentation and remedial management; and
- portfolio limits to ensure diversification and maintain risk/capital alignment.

Large exposure limit reports are circulated daily that show the Company's exposure to various counterparty groupings as a proportion of its own funds. Regulations also require that the Company does not exceed specified limits for its non-trading book exposures. Independent credit risk management works with the Regulatory Reporting Group within Finance to identify, monitor, and escalate any growing concentrations of credit exposure to groups of connected counterparties.

Wrong-way risk occurs when the exposure to a particular counterparty is positively correlated with the probability of default of the counterparty itself. Specific wrong-way risk arises when the exposure to a particular counterparty is positively correlated with the probability of default of the counterparty itself because of the nature of the transaction(s) with the counterparty. General wrong-way risk arises when the probability of default of counterparties is positively correlated with general market risk factors. This is monitored at a Company level, and includes circulation of a monthly report that identifies CDS based, OTC or securities financing transactions (SFTs) that generate specific wrong-way risk. Wrong-way risk is mitigated through the use of enforceable netting agreements and margining.

The Company seeks to restrict its exposure to credit losses by entering into master netting arrangements with most counterparties with which it undertakes a significant volume of transactions. Master netting arrangements do not generally result in an offset of balance sheet assets and liabilities, as transactions are usually settled on a gross basis. However, the credit risk associated with favourable contracts is reduced by a master netting arrangement to the extent that if an event of default occurs, all amounts with the counterparty are terminated and settled on a net basis. Many of these arrangements also provide for the calling and posting of variation margin or collateral, further reducing the Company's exposures. The internal measurement of exposure on each credit facility considers legally enforceable netting and margining arrangements – both in terms of current exposure and in terms of the simulated calculation of potential future exposure.

29. Financial instruments and risk management (continued)

Credit risk (continued)

The following table presents the maximum exposure to credit risk, before taking account of any collateral held or other credit enhancements. It also illustrates the impact on the balance sheet of offsetting, master netting agreements and cash and non-cash collateral.

	2022 $ Million						
Assets	**Gross exposure**	**Amounts set off on the balance sheet**	**Net exposure**	**Impact of master netting agreements**	**Cash collateral**	**Securities collateral**	**Net exposure**
Derivatives	197,965	—	197,965	(130,979)	(62,682)	(10,013)	(5,709)
Collateralised financing transactions	226,666	(54,477)	172,189	—	—	(172,189)	—
	424,631	(54,477)	370,154	(130,979)	(62,682)	(182,202)	(5,709)
Liabilities							
Derivatives	198,725	—	198,725	(130,979)	(65,000)	(5,712)	(2,966)
Collateralised financing transactions	168,840	(54,477)	114,363	—	—	(114,363)	—
	367,565	(54,477)	313,088	(130,979)	(65,000)	(120,075)	(2,966)

	2021 $ Million						
Assets	**Gross exposure**	**Amounts set off on the balance sheet**	**Net exposure**	**Impact of master netting agreements**	**Cash collateral**	**Securities collateral**	**Net exposure**
Derivatives	157,281	—	157,281	(125,536)	(27,948)	(3,797)	—
Collateralised financing transactions	233,583	(75,020)	158,563	—	—	(158,563)	—
	390,864	(75,020)	315,844	(125,536)	(27,948)	(162,360)	—
Liabilities							
Derivatives	161,797	—	161,797	(125,536)	(35,263)	(6,793)	(5,795)
Collateralised financing transactions	181,332	(75,020)	106,312	—	—	(106,312)	—
	343,129	(75,020)	268,109	(125,536)	(35,263)	(113,105)	(5,795)

The offset amounts for the impact of master netting agreements for derivatives in the above tables relate to exposures where the counterparty has an offsetting derivative exposure with the Company and a master netting agreement is in place. These amounts do not qualify for net presentation for accounting purposes as settlement may not actually be made on a net basis.

29. Financial instruments and risk management (continued)

Credit risk (continued)

The collateralised financing transactions offset adjustment relates to balances arising from repurchase and reverse repurchase transactions. The offsets relate to balances where there is a legally enforceable right of offset in the event of counterparty default and consequently a net exposure for credit risk management purposes. Credit risk exposure is monitored on an asset basis except for positions which are specifically collateralised, normally in the form of cash.

As at 31 December the Company's third-party credit exposure (mark to market plus potential future exposure as determined by the Company's internal measure) in relation to collateralised financing transactions and derivatives was distributed as shown in the table below (these exposures do not include derivative and collateralised financing transactions with other group undertakings). The following table shows CGML's exposures categorised by industry.

Industry	2022 %	2021 %
Commercial and universal banks	20.2	24.1
Insurance and fund management (pension funds and mutual funds)	32.9	28.0
Brokers and investment banks	3.4	3.3
Corporates	24.2	19.2
Public Sector	15.8	22.5
Other (including SPVs and Hedge Funds)	3.4	2.9
	100	100

The credit quality of the Company's financial assets is maintained by adherence to relevant Citi policies. The Company monitors the credit ratings of its counterparties with the table below presenting an analysis of the Company's trading inventory and derivative transactions by rating agency designation based on Standard & Poor's, Moody's and Fitch ratings as at 31 December:

	Government bonds		Non-government bonds		Derivatives	
	2022 %	2021 %	2022 %	2021 %	2022 %	2021 %
AAA / AA / A	79.0	71.9	72.5	81.4	39.4	37.2
BBB	14.4	20.4	13.3	9.1	3.2	2.8
BB / B	2.2	2.3	4.5	4.5	0.7	0.8
CCC or below	0.5	1.2	1.3	1.4	—	—
Central counterparty (unrated)	—	—	—	—	31.6	33.3
Unrated	3.9	4.2	8.4	3.6	25.1	25.9
	100.0	100.0	100.0	100.0	100.0	100.0

As discussed above the credit risk is mitigated through the use of collateral, netting arrangements and the application of credit limits.

29. Financial instruments and risk management (continued)

Operational risk (unaudited)

Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people, and systems or from external events. This definition of operational risk includes legal risk which is the risk of loss (including litigation costs, settlements, and regulatory fines) resulting from the failure of Citi to comply with laws, regulations, prudent ethical standards, and contractual obligations in any aspect of the Citi business but excludes strategic and reputation risks. Citi also recognises the impact of Operational Risk on the reputation risk associated with Citi's business activities.

The objective is to keep operational risk at appropriate levels relative to the characteristics of Citi's businesses, the markets in which it operates, its capital and liquidity, and the competitive, economic and regulatory environment.

Citi maintains an Operational Risk Management (ORM) framework with a Governance Structure to ensure effective management of Operational Risk across Citi.

To anticipate, mitigate and control operational risk, Citi maintains a system of policies and has established a consistent framework for monitoring, assessing, and communicating operational risks and the overall effectiveness of the internal control environment across Citi. As part of this framework, Citi has defined its operational risk appetite and has established a Manager's Control Assessment (MCA) programme which helps managers to self-assess key operational risks and controls and to identify and address weaknesses in the design and effectiveness of internal controls that mitigate significant operational risks.

The ORM Framework establishes a foundation on which the activities of businesses, regions and functions, the resulting operational risks and the associated controls are identified, periodically assessed, subject to corrective action, appropriately documented and communicated. Specifically, the ORM Framework establishes minimum standards for consistent identification, measurement, monitoring, reporting, and management of operational risk across Citi.

The process established by the ORM Framework is expected to lead to effective anticipation and mitigation of operational risk and improved operational risk loss experience and includes the following steps:

- establish and monitor Operational Risk Appetite;
- identify and assess Key Operational Risks (KORs);
- design controls to mitigate identified risks;
- establish Key Risk Indicators (KRIs);
- implement a process for early problem recognition and timely escalation;
- produce comprehensive operational risk reporting; and
- ensure that sufficient resources are available to actively improve the operational risk environment and mitigate emerging risks.

As new products and business activities are developed, processes are designed, modified or sourced through alternative means and operational risks are considered.

In addition, ORM proactively assists the businesses, operations and technology and the other independent control groups in enhancing the effectiveness of controls and managing operational risks across products, business lines and regions, and facilitates the management of operational risk at a Citi and Company level.

29. Financial instruments and risk management (continued)

Operational risk (unaudited) (continued)

Measurement

To support advanced capital modelling and management, each business is required to capture relevant operational risk event information. A localised version of the Citi risk capital model for operational risk has been developed and applied against CGML. The PRA has approved this model, for use within the Company as an "Advanced Measurement Approach". It uses a combination of internal and external loss data to support statistical modelling of capital requirement estimates, which are then adjusted to incorporate qualitative aspects of the operational risk and control environment.

To enhance its operational risk management, CGML has implemented a forward-looking scenario analysis programme to identify and quantify emerging operational risks, through a systematic process of obtaining opinions from business managers and risk management experts to derive reasoned assessments of the likelihood and loss impact of plausible, high severity operational risk losses. Scenario results are used to create a management overlay to CGML's operational risk capital model estimates. An AMA model change request is currently pending with the PRA, if approved this will allow scenario analysis impact to be included in the capital model outputs removing the overlay mentioned above.

In addition, there are various governance forums for escalation and reporting of internal control, compliance, regulatory and risk issues, including operational risk loss events.

Key Operational Risks (KOR) are derived from an evaluation of operational risk exposure on a residual risk basis considering its current business strategy, substantial emerging risks and other relevant factors which include assessment of the four Basel operational risk data elements (i.e. internal losses, external losses, scenario analysis, output from Internal Audit Assessments) and from self-assessment results from the Manager's Control Assessment (MCA). The identified KORs for CGML include those set out below. These Risks are aligned to the updated Citi-wide global risk taxonomy that has been developed for operational and compliance risks.

ORM liaises with Subject Matter Experts (SMEs) aligned to each KOR in order to define CGML's risk and to identify appropriate metrics i.e., Key Indicators (KIs) to monitor the profile of each KOR. Given that CGML's business is almost entirely wholesale in nature (falling within the ICG), segment metrics are leveraged as far as possible.

CGML KORs as of 31 December 2022:

- Processing Risk
- Cyber Risk
- Internal Fraud Risk
- Model Risk
- Reporting Risk
- eTrading Risk (Conduct Risk, Processing Risk and Technology Risk)
- Data Management Risk
- Conduct Risk (Market Practices Risk)
- Financial Crime Risk (Anti-Money Laundering ("AML") & Sanctions Risk)
- Third Party Management including Affiliates Risk
- Geopolitical Risk (Processing Risk, Prudential & Regulatory Risk, and Damage to Physical Assets Risk)
- Human Capital Risk

CGML's KORs have been incorporated with the Citi-level global operational risk appetite framework in order to derive CGML's Risk Appetite against risk types in the standardised GRC operational risk taxonomy. These risk types are supported by related metrics and appropriately set thresholds. The Risk Appetite is regularly monitored and reported to CGML's senior governance forums.

29. Financial instruments and risk management (continued)

Reputation and Franchise Risk and New Products or Services

A Citi-wide (including an EMEA-based) Reputational Risk Committee reviews practices involving reputational or franchise issues. These committees review whether Citi's business practices have been designed and implemented in a way that meets the highest standards of professionalism, integrity, and ethical behaviour.

Additional committees ensure that product risks are identified, evaluated, and determined to be appropriate for Citi and its customers, and safeguard the existence of necessary approvals, controls, and accountabilities.

The New Activity Committee (NAC) is designed to ensure that significant risks, including reputational and franchise risks, for all new ICG products, services, or complex transactions, are identified and evaluated, determined to be appropriate, properly recorded for risk aggregation purposes, effectively controlled, and have accountabilities in place.

Country Risk

Country risk is the risk that an event in a country (precipitated by developments within or external to that country) will impair the value of Citi's franchise or will adversely affect the ability of obligors within that country to honour their obligations to Citi. Country risk events may include sovereign defaults, banking defaults or crises, currency crises and/or political events.

The country designation in Citi's risk management systems is based on the country to which the client relationship, taken as a whole, is most directly exposed with regard to economic, financial, socio-political or legal risks. This includes exposure to subsidiaries within the client relationship that are domiciled outside of the country.

Citi assesses the risk of loss associated with certain of the country exposures on a regular basis, with the country concentration limits reviewed as and when economic performance is viewed as deteriorating. These analyses take into consideration alternative scenarios that may unfold, as well as specific characteristics of the Company's portfolio, such as transaction structure and collateral and the Company's exposure in these countries may vary over time, based upon its franchise, client needs and transaction structures.

Pension Risk

The Company's defined benefit schemes are measured on an actuarial basis, with the key assumptions being inflation, discount rate, mortality, and investment returns. Return on assets is an average of expected returns weighted by asset class.

Mortality assumptions are based upon the relevant standard industry and national mortality tables. Discount rates are based on specific corporate bond indices which reflect the underlying yield curve of each scheme. Management judgement is required in estimating the rate of future salary growth. All assumptions are unbiased, mutually compatible and based upon market expectations at the reporting date.

Further information about the Company's Pension schemes is contained in Note 8 'Pension'.

Managing interest rate benchmark reform and associated risks

LIBOR and other rates or indices deemed to be benchmarks have been subject of ongoing regulatory scrutiny and reform. The LIBOR administrator ceased publication of non-USD LIBOR and one week and two-month USD LIBOR on a representative basis on 31 December 2021, with plans to cease publication of all other USD LIBOR tenors on 30 June 2023. As a result, Citi ceased entering into new contracts referencing USD LIBOR as of 1 January 2022, other than for limited circumstances where regulators recognized that it may be appropriate for banks to enter into new USD LIBOR contracts, including with respect to market-making, hedging or novations of USD transactions executed before 1 January 2022.

29. Financial instruments and risk management (continued)

Managing interest rate benchmark reform and associated risks (continued)

LIBOR and other benchmarks have been used in a substantial number of the company's outstanding securities and products, including, among others, derivatives, loans, collateralised financing transactions, securities sold not yet purchased and bonds. Citi recognizes that a transition away from and discontinuance of LIBOR, also the replacement of some interbank offered rates (IBORs) presents various risks and challenges that could significantly impact financial markets and market participants, including Citi. Accordingly, Citi has continued its efforts to identify and manage its interest rate benchmark reform risks. Citi has established a LIBOR governance and implementation program focused on identifying and addressing the impact of LIBOR transition on Citi's clients, operational capabilities and financial contracts. The program operates globally across Citi's businesses and functions and includes active involvement of senior management. As part of the program, Citi has continued to implement its LIBOR transition action plans and associated roadmaps under the following key workstreams: program management; transition strategy and risk management; customer management, including internal communications and training, legal/contract management and product management; financial exposures and risk management; regulatory and industry engagement; operations and technology; and finance, risk, tax and treasury

During 2022, the Company continued its efforts to manage its interest rate benchmark reform risks. The Company has been focused on further reducing its LIBOR exposure and remediating its remaining outstanding LIBOR-linked contracts. In addition, the Company has continued to monitor and engage on legislative, regulatory and other initiatives and developments related to interest rate benchmark reform matters.

The Company has also continued to use alternative reference rates in certain newly issued financial instruments. The Company has issued floating rate benchmark and customer-related debt linked to SOFR and originated and arranged loans linked to SOFR. The Company's derivatives contracts are generally linked to SOFR and other global alternative reference rates. The Company also provides term SOFR-linked products to clients in accordance with industry best practices and recommendations.

	USD Libor	ICESWAP USD	Others*****	Total
	$ Million	$ Million	$ Million	$ Million
IBOR Exposures by Benchmarks*				
Financial Assets**	362	20	64	446
Financial Liabilities***	5,603	8	11	5,622
Derivates Notional****	684,883	37,437	17,912	740,232

*by 31 December 2022, the Company has exposure indexed to a benchmark that is still subject to IBOR reform.
**Financial assets include bonds, collateralised financing transactions etc.
***Financial liabilities include loans, securities sold not yet purchased, collateralised financing transactions etc.
****Derivatives presented are notional values.

***** Others include GBP Libor, CDOR CAD, ICESWAP GBP, SOR and THBFIX.

30. Capital management (unaudited)

As a UK regulated entity, CGML is required to hold sufficient regulatory capital to meet its Individual Capital Guidance, CRDIV buffers and any applicable buffers mandated by the PRA. The Company monitors its CET1, Tier 1, total capital ratios and overall capital adequacy daily. The externally mandated regulatory requirements also form part of the Company's internal capital management toolkit, with capital management constituting a key focus for a number of internal committees, in particular the UK ALCO. CGML's capital management framework encompasses a set of internal limits and escalations, defined using a red-amber-green structure. In accordance with these escalations, specified actions are taken and the responsible people are notified at each stage. In addition, the UK ALCO is kept informed of any trigger breaches. CGML also has in place a risk appetite framework to manage the risks to which it is exposed through its business activities: these are both quantitative and qualitative.

30. Capital management (unaudited) (continued)

During 2022, CGML remained in compliance with all externally imposed capital requirements. Quantitative details of CGML's regulatory capital position are included in Section 4 of the Strategic Report.

The capital management of CGML is further explained in its Basel Pillar III disclosures document, which can be found at http://www.citigroup.com/citi/investor/reg.htm. Further details of CGML's Regulatory Capital are also included in section 4.3 on page 14 of this report.

31. Registered charges

The Company has granted to various banks and other entities a number of fixed and floating charges over certain holdings in securities, properties, collateral and monies held by or on behalf of such banks or other entities.

32. Other commitments

a) Financial guarantees

As at 31 December 2022, the Company had $34 million (2021: $28 million) of unsecured letters of credit and financial guarantees outstanding from banks to satisfy various collateral requirements.

b) Capital commitments

As at 31 December 2022, the Company had no capital commitments (2021: $nil).

33. Related party transactions

The Company is a wholly owned subsidiary undertaking of CGMHBL, which is incorporated in the Bahamas. The largest group in which the results of the Company are consolidated is that headed by Citigroup Inc., which is incorporated in the United States of America. The Company defines related parties as the Board of Directors, senior management, their close family members, parent and fellow subsidiaries and associated companies.

A number of arm's length transactions are entered into with related parties. Various services are provided between related parties and these are also provided at arm's length.

Key management personnel compensation comprised of the following:

	2022 $ Million	2021 $ Million
Remuneration		
Short-term employee benefits	19	18
Post-employment benefits	—	—
Other long-term benefits	—	5
Share-based payment	11	7
	30	30

At 31 December 2022, the number of the key personnel was 42 (2021: 50). The remuneration of the key personnel included in the above figures are for CGML Directors, Leadership team and Senior Managers.

Short-term employee benefits comprise salary, role based allowance, incentive compensation in the form of cash payable within twelve months, and other non-monetary benefits such as medical care, housing and cars.

Post-employment benefits include employer paid to pension funds and life insurance. Other long-term benefits include deferred cash incentive compensation which would be payable after twelve months. Share-based payments comprise of share based incentive compensation which would be payable at any period.

33. Related party transactions (continued)

The table below summarises balances and transactions with related parties:

2022	Immediate parent company $ Million	Subsidiaries $ Million	Other related parties $ Million
Assets			
Financial assets at amortised cost			
– cash at bank	—	—	1,896
– collateralised financing transactions	—	4,921	64,146
Financial assets mandatorily at fair value through profit or loss			
– derivatives	—	4,034	85,742
– inventory	—	—	—
– equity securities held for investment	—	—	—
Financial assets designated at fair value through profit or loss	—	—	1,590
Investments in subsidiary and related undertakings	—	4,330	—
Pension asset	—	—	—
Other assets	—	1,215	10,582
Liabilities			
Financial liabilities at amortised cost			
– bank loans and overdrafts	—	—	10,028
– collateralised financing transactions	—	5,502	36,569
Financial liabilities mandatorily at fair value through profit or loss			
– derivatives	—	3,588	88,452
– securities sold but not yet purchased	—	289	—
Financial liabilities designated at fair value through profit or loss	—	26,311	409
Other liabilities	—	935	8,353
Subordinated loans	—	—	11,100
Guarantees and commitments	—	—	—
Income statement			
Fee and commission income	—	12	135
Net dealing income /(expense)	—	10,050	(549)
Interest receivable	—	(83)	1,002
Interest payable	—	(51)	(1,253)
Operating expenses	—	(89)	(556)
Net finance income on pension	—	—	—
Other income	—	—	—

33. Related party transactions (continued)

2021	Immediate parent company $ Million	Subsidiaries $ Million	Other related parties $ Million
Assets			
Financial assets at amortised cost			
– cash at bank	—	—	2,372
– collateralised financing transactions	—	4,927	52,957
Financial assets mandatorily at fair value through profit or loss			
– derivatives	—	3,645	78,335
– inventory	—	—	—
– equity securities held for investment	—	—	—
Financial assets designated at fair value through profit or loss	—	—	—
Investments in subsidiary and related undertakings	—	3,831	—
Pension asset	—	—	—
Other assets	—	1,198	8,655
Liabilities			
Financial liabilities at amortised cost			
– bank loans and overdrafts	—	—	5,678
– collateralised financing transactions	—	6,399	35,255
Financial liabilities mandatorily at fair value through profit or loss			
– derivatives	—	3,684	80,263
– securities sold but not yet purchased	—	2,925	—
Financial liabilities designated at fair value through profit or loss	—	23,677	—
Other liabilities	—	252	7,029
Subordinated loans	—	—	8,600
Guarantees and commitments	—	—	—
Income statement			
Fee and commission (expense)/ income		19	271
Net dealing expense	—	4,653	(2,527)
Interest receivable	—	(86)	129
Interest payable	—	—	(352)
Operating expenses	—	(16)	(506)
Net finance income on pension	—	—	—
Other income	—	—	—

No provisions have been recognised (2021: $nil) in respect of doubtful debts related to the amount of outstanding balances and no expense has been recognised during the year (2021: $nil) in respect of bad or doubtful debts due from related parties.

During 2022, the Company made a total of $500 million (2021: $1,703 million) capital contribution to its subsidiary CGME. As at 31 December 2022, the other equity instruments of CGML consist of a) $2,000 million of Additional Tier 1 Notes to Citicorp LLC b) $2,300 million of Additional Tier 1 Notes to Pipestone LLC, another Citi entity.

34. Events after the reporting period

The failures of US regionals Silicon Valley Bank and Signature Bank, together with the government-sponsored acquisition of Credit Suisse by UBS, have resulted in increased financial market volatility and a revision of market expectations around future monetary policy. However, some parts of the market have recovered relatively quickly and in the near-term the situation has broadly stabilised. Nevertheless, if further stresses emerge in the banking sector or elsewhere in financial markets as a result of the tightening of monetary policy, market volatility would be expected to increase again.

At the date on which these financial statements were approved, there were no other significant events affecting the Company since the year end.

35. Group structure

The Company's immediate parent undertaking is Citigroup Global Markets Holdings Bahamas Limited (CGMHBL), a company registered at Ocean Centre, Montagu Foreshore, East Bay Street, and P.O. Box N3247, Nassau, Bahamas. The Company's ultimate parent company and ultimate controlling party is Citigroup Inc., registered at 1209 Orange Street, Wilmington, DE 19801 United States of America.

The audited consolidated financial statements of Citigroup Inc. are made available to the public annually in accordance with Securities and Exchange Commission regulations and may be obtained from https://www.citigroup.com/citi/investor/sec.htm

36. Revenue analysis

As outlined in the Strategic Report, the Company is Citi's international broker dealer and management reviews its performance by geography in the same way as Citigroup Inc. reports its performance.

Citi is organised into four regions, Asia Pacific, EMEA, Latin America and North America.

	Asia Pacific	EMEA	Latin America	North America	Total Regional	Other / Corp	Total
Revenue by Region	**$ Million**	**$ Million**	**$ Million**	**$ Million**	**$ Million**	**$ Million**	**$ Million**
2022 Revenues	599	2,762	71	(211)	3,221	403	3,624
2021 Revenues	579	2,636	27	(276)	2,966	531	3,497
Increase/(decrease) compared to prior year	20	126	44	65	255	(128)	127

37. Country by country reporting

Nature of activities

CGML is headquartered in London and operates globally, generating the majority of its business from the EMEA region, with the remainder coming from business executed with clients in Asia and the Americas.

As at 31 December 2022, the Company had four branch offices and four subsidiaries. The Company's branches in the European Union (EU) were established under the 1993 Investment Services Directive, which has been superseded by the 2005 Markets in Financial Instruments Directive (MiFID). The passported branch is located in the Italy. During 2022, the Czech Republic branch of CGML was liquidated. The Company has made notifications to the PRA to conduct cross-border MiFID services into all European Economic Area (EEA) states. Additionally, the Company has non-EU branches in Dubai, Israel and Switzerland as well as subsidiaries in Luxembourg, Monaco and Germany.

EU Branches	Non-EU Branches	Subsidiaries
• Italy (in liquidation)	• Switzerland	• Citigroup Global Markets Luxembourg S.a.R.L (Luxembourg) (liquidated on 7 December 2021)
• Czech Republic (liquidated)	• Dubai	• Citigroup Global Markets Funding Luxembourg SCA (Luxembourg)
	• Israel	• Citigroup Global Markets Funding Luxembourg GP S.a.R.L (Luxembourg)
		• Citi Global Wealth Management S.A.M (Monaco)
		• Citigroup Global Markets Europe AG (Germany)

The Company is a dealer, market maker and underwriter in equities, fixed income securities and commodities, and provides investment banking and advisory services to a wide range of corporate, institutional and government clients. The Company's trading activities, which are part of Citi's ICG business, encompass cash, exchange-traded and OTC derivative markets. The Company's major counterparties are banks, other investment firms, investment managers, insurers, and hedge funds. The Company does not originate securitisations or engage in leveraged finance transactions as principal. The Company employs a number of specific individuals who hold key roles or have overall responsibility for whole areas of business on UK entities and branches.

As Citi's primary investment firm in EMEA, the Company is the main employer of front office staff in Western Europe. The Company also provides some operational and technology services to other Citi entities, in line with the global technology model used by these businesses. The Company also relies on shared services provided centrally, or by local Citi entities, for which there are various intercompany service agreements.

The Company has in place a dedicated management team and governance structure to establish a cohesive strategy for all relevant businesses and functions. Critical risk and control functions such as finance, risk management, legal and compliance are all managed centrally to ensure compliance with established policies and standards across the Company, irrespective of business location.

37. Country by country reporting (continued)

For the purposes of CBCR, the appropriate disclosures required are summarised below:

	2022 ($ Million)				2022
Country	**Turnover**	**Profit before Tax**	**Corporation Tax Paid (on cash basis)**	**Public Subsidies Received**	**Average Number of Employees**
Dubai	4	1	—	—	6
Israel	71	6	2	—	274
Italy	—	(1)	—	—	—
Switzerland	11	1	—	—	18
United Kingdom	3,538	336	—	—	3,913
Sub - Total	**3,624**	**343**	**2**	**—**	**4,211**
Withholding Tax	—	—	66	—	—
Total	**3,624**	**343**	**68**	**—**	**4,211**

	2021 ($ Million)				2021
Country	**Turnover**	**Profit before Tax**	**Corporation Tax Paid (on cash basis)**	**Public Subsidies Received**	**Average Number of Employees**
Dubai	7	—	—	—	6
Israel	57	5	1	—	209
Italy	—	1	—	—	—
Switzerland	9	(1)	—	—	16
United Kingdom	3,431	429	28	—	3,355
Sub - Total	**3,497**	**434**	**29**	**—**	**3,586**
Withholding Tax	—	—	96	—	—
Total	**3,497**	**434**	**125**	**—**	**3,586**

37. Country by country reporting (continued)

Basis of preparation

The basis of specific items of disclosure are as follows:

Turnover

Turnover comprises the following lines of the Profit & Loss Account of the Company's audited Financial Statements:

- Commission income and fees;
- Net dealing income;
- Interest receivable; and
- Interest payable.

Profit or (loss) before income tax

Profit and loss before tax is reported in line with the profit and loss before tax as presented in the Income statement on page 27.

Corporation tax paid / (received) (on cash basis)

Represents the total amount of income tax actually paid during the relevant fiscal year by CGML, including its branches in the relevant tax jurisdiction, as well as withholding tax which is an income tax paid by the payer of the income and treated as a payment on account of the recipient's tax liability. The withholding tax has been disclosed separately and where creditable has been offset against the UK corporation tax liability to prevent the same income being taxed twice.

This is distinct from the tax liability on the profit before income tax for the fiscal year, which in some cases is paid in instalments across the current and following year, such that in any year, cash tax paid is made up of part of the current and part of the prior year tax liabilities. These liabilities will depend on a number of factors including the existence of prior year losses which may be available for offset as well as items which may be booked outside of the income statement.

Public subsidies received

The CBCR Regulations do not include a definition of public subsidies received. The Company has determined that this will only include direct support by the Government and that it does not consider central bank interventions or tax incentives such as Research & Development tax credits as public subsidies.

Number of employees

Represents the average number of employees on a full-time equivalent (FTE) basis determined by taking an annual average of monthly total FTE, excluding any agency and contracting staff, under employment contracts in each country.

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

WASHINGTON, D.C. 20549

FORM 10-K

(Mark One)

☒ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2022

OR

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the transition period from to

Commission file number 1-9924

Citigroup Inc.

(Exact name of registrant as specified in its charter)

Delaware	**52-1568099**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification No.)
388 Greenwich Street, New York NY	**10013**
(Address of principal executive offices)	(Zip code)

(212) 559-1000

(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Securities Exchange Act of 1934 formatted in Inline XBRL: See Exhibit 99.01

Securities registered pursuant to Section 12(g) of the Act: none

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer ☒	**Accelerated filer ☐**	**Non-accelerated filer ☐**	**Smaller reporting company ☐**
			Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. Yes ☐

Indicate by check mark whether the Registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

If securities are registered pursuant to Section 12(b) of the Act, indicate by check mark whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements. ☐

Indicate by check mark whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b). ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☒

The aggregate market value of Citigroup Inc. common stock held by non-affiliates of Citigroup Inc. on June 30, 2022 was approximately $88.9 billion.

Number of shares of Citigroup Inc. common stock outstanding on January 31, 2023: 1,943,712,436

Documents Incorporated by Reference: Portions of the registrant's proxy statement for the annual meeting of stockholders scheduled to be held on April 25, 2023 are incorporated by reference in this Form 10-K in response to Items 10, 11, 12, 13 and 14 of Part III.

Available on the web at www.citigroup.com

FORM 10-K CROSS-REFERENCE INDEX

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* For additional information regarding Citigroup's Directors, see "Corporate Governance" and "Proposal 1: Election of Directors" in the definitive Proxy Statement for Citigroup's Annual Meeting of Stockholders scheduled to be held on April 25, 2023, to be filed with the SEC (the Proxy Statement), incorporated herein by reference.

** See "Compensation Discussion and Analysis," "The Personnel and Compensation Committee Report," and "2022 Summary Compensation Table and Compensation Information" and "CEO Pay Ratio" in the Proxy Statement, incorporated herein by reference, other than disclosure under the heading "Pay versus Performance" information responsive to Item 402(v) of Regulation S-K of SEC rules.

*** See "About the Annual Meeting," "Stock Ownership," and "Equity Compensation Plan Information" in the Proxy Statement, incorporated herein by reference.

**** See "Corporate Governance—Director Independence," "—Certain Transactions and Relationships, Compensation Committee Interlocks and Insider Participation" and "—Indebtedness" in the Proxy Statement, incorporated herein by reference.

***** See "Proposal 2: Ratification of Selection of Independent Registered Public Accountants" in the Proxy Statement, incorporated herein by reference.

CITIGROUP'S 2022 ANNUAL REPORT ON FORM 10-K

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OVERVIEW

Citigroup's history dates back to the founding of the City Bank of New York in 1812.

Citigroup is a global diversified financial services holding company whose businesses provide consumers, corporations, governments and institutions with a broad, yet focused, range of financial products and services, including consumer banking and credit, corporate and investment banking, securities brokerage, trade and securities services and wealth management. Citi has approximately 200 million customer accounts and does business in nearly 160 countries and jurisdictions.

At December 31, 2022, Citi had approximately 240,000 full-time employees, compared to approximately 223,400 full-time employees at December 31, 2021. For additional information, see "Human Capital Resources and Management" below.

Throughout this report, "Citigroup," "Citi" and "the Company" refer to Citigroup Inc. and its consolidated subsidiaries. For a list of certain terms and acronyms used herein, see "Glossary of Terms and Acronyms" at the end of this report. All "Note" references correspond to the Notes to the Consolidated Financial Statements.

Additional Information

Additional information about Citigroup is available on Citi's website at www.citigroup.com. Citigroup's recent annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and proxy statements, as well as other filings with the U.S. Securities and Exchange Commission (SEC) are available free of charge through Citi's website by clicking on the "Investors" tab and selecting "SEC Filings." The SEC's website also contains these filings and other information regarding Citi at www.sec.gov.

For a discussion of 2021 versus 2020 results of operations of *Institutional Clients Group (ICG)*, *Personal Banking and Wealth Management (PBWM)*, *Legacy Franchises* and *Corporate/Other*, see each respective business's results of operations in Citigroup's Annual Report on Form 10-K for the year ended December 31, 2021 and its Current Report on Form 8-K dated May 10, 2022 (as amended by a Current Report on Form 8-K/A dated May 10, 2022) (collectively referred to as Citigroup's 2021 Annual Report on Form 10-K).

Certain reclassifications have been made to the prior periods' financial statements and disclosures to conform to the current period's presentation.

Please see "Risk Factors" below for a discussion of material risks and uncertainties that could impact Citi's businesses, results of operations and financial condition.

Non-GAAP Financial Measures

Citi prepares its financial statements in accordance with U.S. GAAP and also presents certain non-GAAP financial measures (non-GAAP measures) that exclude certain items or otherwise include components that differ from the most directly comparable measures calculated in accordance with U.S. GAAP. Non-GAAP measures are provided as additional useful information to assess Citi's financial condition and results of operations (including period-to-period operating performance). These non-GAAP measures are not intended as a substitute for GAAP financial measures and may not be defined or calculated the same way as non-GAAP measures with similar names used by other companies. For more information, including the reconciliation of these non-GAAP financial measures to their corresponding GAAP financial measures, see the respective sections where the measures are presented and described and the "Glossary of Terms and Acronyms" below.

Citigroup is managed pursuant to three operating segments: *Institutional Clients Group, Personal Banking and Wealth Management* and *Legacy Franchises*. Activities not assigned to the operating segments are included in *Corporate/Other*.

Citigroup Operating Segments

Institutional Clients Group (ICG)

- **Services**
  - Treasury and trade solutions (TTS)
  - Securities services
- **Markets**
  - Equity markets
  - Fixed income markets
- **Banking**
  - Investment banking
  - Corporate lending

Personal Banking and Wealth Management (PBWM)

- **U.S. Personal Banking**
  - Cards
    - Branded cards
    - Retail services
  - Retail banking
- **Global Wealth Management (Global Wealth)**
  - Private bank
  - Wealth at Work
  - Citigold

Legacy Franchises

- **Asia Consumer Banking (Asia Consumer)**
  - Retail banking and cards for the remaining 8 exit markets (China, India, Indonesia, Korea, Poland, Russia, Taiwan and Vietnam)
- **Mexico Consumer Banking (Mexico Consumer)** and **Mexico Small Business and Middle-Market Banking (Mexico SBMM)**
  - Retail banking and cards
- **Legacy Holdings Assets**
  - Certain North America consumer mortgage loans
  - Other legacy assets

Corporate/Other

- **Corporate Treasury managed portfolios**
- **Operations and technology**
- **Global staff functions and other corporate expenses**
- **Discontinued operations**

The following are the four regions in which Citigroup operates. The regional results are fully reflected in the operating segments and *Corporate/Other* above.

Citigroup Regions[1]

- North America
- Europe, Middle East and Africa (EMEA)
- Latin America
- Asia

(1) North America includes the U.S., Canada and Puerto Rico, Latin America includes Mexico and Asia includes Japan.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

EXECUTIVE SUMMARY

As described further throughout this Executive Summary, Citi demonstrated continued progress across the franchise during 2022:

- Citi's revenues increased 5% versus the prior year, including net gains on sales of Citi's Philippines and Thailand consumer banking businesses versus a loss on sale of Citi's Australia consumer banking business in the prior year. Excluding these divestiture-related impacts (see "2022 Results Summary" below), revenues increased 3%, driven by higher net interest income, partially offset by lower non-interest revenues.
- Citi's expenses increased 6% versus the prior year, including divestiture-related impacts in both the current and prior years. Excluding these divestiture-related impacts (see "2022 Results Summary" below), expenses increased 8%, driven by continued investments in Citi's transformation, business-led investments and volume-related expenses, as well as other risk and control investments and inflation, all partially offset by productivity savings, the impact of foreign exchange translation and the expense reduction from the closure of five exit markets (see also "Expenses" below).
- Citi's cost of credit was $5.2 billion, versus $(3.8) billion in the prior year, largely reflecting a net build of $1.2 billion in the allowance for credit losses (ACL) for loans and unfunded commitments, primarily due to consumer loan growth and a deterioration in macroeconomic assumptions, compared to a net ACL release of $8.8 billion in the prior year.
- Citi returned $7.3 billion to common shareholders in the form of dividends and share repurchases.
- Citi's Common Equity Tier 1 (CET1) Capital ratio increased to 13.0% as of December 31, 2022, compared to 12.2% as of December 31, 2021 (for additional information, see "Capital Resources" below). Citi's required regulatory CET1 Capital ratio was 12.0% as of January 1, 2023, under the Basel III Standardized Approach.
- Citi made substantial progress on its consumer banking business divestitures in 2022, closing sales in five exit markets and working toward closing four additional sale transactions, as well as progressing with the ongoing wind-downs of the Korea consumer banking business and Russia consumer, local commercial and institutional businesses.

2022 Results Summary

Citigroup

Citigroup reported net income of $14.8 billion, or $7.00 per share, compared to net income of $22.0 billion, or $10.14 per share in the prior year. The decrease in net income was primarily driven by the higher cost of credit, resulting from loan growth in *Personal Banking and Wealth Management (PBWM)* and a deterioration in macroeconomic assumptions, and the higher operating expenses, partially offset by the higher revenues. Citigroup's effective tax rate was 19.4% in the current year versus 19.8% in the prior year. Earnings per share (EPS) decreased 31%, reflecting the decrease in net income, partially offset by a 4% decline in average diluted shares outstanding.

As discussed above, results for 2022 included divestiture-related impacts of approximately $(184) million in after-tax earnings, substantially all of which were recorded in *Legacy Franchises* (for additional information, see discussion below). Collectively, divestiture-related impacts had a $0.09 negative impact on EPS. This compares to divestiture-related negative impacts on EPS of $0.80 in 2021. (As used throughout this Form 10-K, Citi's results of operations and financial condition excluding the divestiture-related impacts are non-GAAP financial measures. Citi believes the presentation of its results of operations and financial condition excluding the divestiture-related impacts described above provides a meaningful depiction of the underlying fundamentals of its broader results and *Legacy Franchises'* results for investors, industry analysts and others.)

Results for 2022 included pretax divestiture-related impacts of approximately $82 million (approximately $(184) million after-tax), substantially all of which were recorded in *Legacy Franchises*, primarily consisting of the following:

- Approximately $618 million Philippines gain on sale recorded in revenues
- Approximately $209 million Thailand gain on sale recorded in revenues
- Approximately $(64) million incremental Australia consumer business loss on sale recorded in revenues
- Approximately $535 million goodwill impairment recorded in expenses due to re-segmentation and timing of divestitures
- Approximately $161 million of aggregate divestiture-related costs

Results for 2021 included pretax divestiture-related impacts of $(1.9) billion (approximately $(1.6) billion after-tax) in *Legacy Franchises*, which primarily consisted of the following:

- Approximately $(694) million Australia loss on sale recorded in revenues
- Approximately $1.1 billion related to charges incurred from the voluntary early retirement program (VERP) in connection with the wind-down of the Korea consumer banking business recorded in expenses
- Contract modification costs related to the Asia divestitures of $119 million

Citigroup revenues of $75.3 billion increased 5% versus the prior year. Excluding the divestiture-related impacts, revenues were up 3%, as the impact of higher interest rates across businesses and strong loan growth in *PBWM* were partially offset by declines in Banking in *Institutional Clients*

Group (ICG) and Asia investment product revenue in Global Wealth Management (Global Wealth), as well as the reduction in revenues from the closure of five exit markets and ongoing wind-downs.

Citigroup's end-of-period loans were $657 billion, down 2% versus the prior year, largely driven by *Legacy Franchises* and the impact of foreign exchange translation. The decline in *Legacy Franchises* primarily reflected the reclassification of loans to *Other assets* to reflect held-for-sale (HFS) accounting, as a result of the signing of sale agreements for consumer banking businesses in Asia Consumer Banking (Asia Consumer), as well as the impact of the ongoing Korea and Russia wind-downs.

Citigroup's end-of-period deposits were $1.4 trillion, up 4% versus the prior year, largely driven by Treasury and trade solutions in *ICG*, partially offset by the impact of foreign exchange translation.

Expenses

Citigroup's operating expenses of $51.3 billion increased 6% in 2022. Reported expenses included divestiture-related impacts of approximately $696 million in the current year and approximately $1.2 billion in the prior year, substantially all of which were recorded in *Legacy Franchises*. Excluding these divestiture-related impacts, expenses increased 8% versus the prior year, largely driven by the following:

- Approximately 2% by transformation investments, with about two-thirds related to the risk, controls, data and finance programs (approximately 25% of the program investments were related to technology).
- Approximately 1% by business-led investments, as Citi continues to hire commercial and investment bankers, as well as client advisors in Global Wealth, and continues to invest in client experience, front-office platforms and onboarding.
- Approximately 1% by higher volume-related expenses across both *PBWM* and *ICG*.
- Approximately 3% by other risk and control investments and inflation, partially offset by a Revlon-related wire transfer recovery, productivity savings, the impact of foreign exchange translation and the expense reduction from the exit markets.

Citi expects to incur higher expenses in 2023, primarily driven by transformation-related investments, volume-related expenses and inflation-related impacts.

Cost of Credit

Citi's total provisions for credit losses and for benefits and claims was a cost of $5.2 billion, compared to a benefit of $3.8 billion in the prior year. Results in 2022 included net credit losses of $3.8 billion versus $4.9 billion in the prior year. The higher cost of credit was driven by the net build of $1.2 billion in the ACL for loans and unfunded commitments, compared to a net ACL release of $8.8 billion in the prior year, partially offset by the lower net credit losses. The net ACL build was primarily due to cards loan growth in *PBWM* and a deterioration in macroeconomic assumptions. For additional information on Citi's ACL, see "Significant Accounting Policies and Significant Estimates—Citi's Allowance for Credit Losses (ACL)" below.

Net credit losses of $3.8 billion decreased 23% from the prior year, largely driven by lower consumer net credit losses. Consumer net credit losses decreased 20% to $3.6 billion, reflecting low loss rates in the first half of 2022, followed by the ongoing normalization of losses toward pre-pandemic levels, particularly in Retail services cards business in *PBWM*. Corporate net credit losses decreased 54% to $178 million, largely driven by improvements in portfolio credit quality.

Citi expects to incur higher net credit losses in 2023, primarily driven by continued normalization toward pre-pandemic levels, particularly in the cards business in *PBWM*.

For additional information on Citi's consumer and corporate credit costs, see each respective business's results of operations and "Credit Risk" below.

Capital

Citigroup's CET1 Capital ratio was 13.0% as of December 31, 2022, compared to 12.2% as of December 31, 2021, based on the Basel III Standardized Approach for determining risk-weighted assets (RWA). The increase was primarily driven by net income, impacts from the closing of the Australia, Philippines and other Asia consumer banking business sales and business actions to reduce RWA, partially offset by the return of capital to common shareholders and interest rate impacts on Citigroup's investment portfolio. The increase in Citi's CET1 Capital ratio was also partially offset by the impact of adopting the Standardized Approach for Counterparty Credit Risk (SA-CCR) on January 1, 2022.

Citigroup's Supplementary Leverage ratio as of December 31, 2022 was 5.8%, compared to 5.7% as of December 31, 2021. The increase was driven by a decrease in Total Leverage Exposure, partly offset by lower Tier 1 Capital. For additional information on Citi's capital ratios and related components, see "Capital Resources" below.

Citi has continued to pause common share repurchases in order to absorb any temporary capital impacts related to any potential signing of a sale agreement for its Mexico Consumer and Small Business and Middle-Market Banking (Mexico Consumer/SBMM) business (for additional information, see "Macroeconomic and Other Risks and Uncertainties" and the capital return risk factor in "Risk Factors" below) and to continue to have ample capital to serve its clients.

Institutional Clients Group

ICG net income of $10.7 billion decreased 25%, driven by a net ACL release in the prior year, versus a net ACL build in the current year, and higher expenses, partially offset by higher revenues. *ICG* operating expenses of $26.3 billion increased 10%, primarily driven by continued investment in Citi's transformation, business-led investments and volume-related expenses, partially offset by a Revlon-related wire transfer recovery, the impact of foreign exchange translation and productivity savings.

ICG revenues of $41.2 billion increased 3% (including losses on loan hedges), as revenue growth in Services and Markets was partially offset by lower revenues in Banking. Results included a gain on loan hedges of $307 million,

compared with a loss on loan hedges of $140 million in the prior year.

Services revenues of $16.0 billion increased 27%. Treasury and trade solutions (TTS) revenues of $12.2 billion increased 32%, driven by 46% growth in net interest income and 10% growth in non-interest revenue. The strong performance in TTS was driven by the benefit of higher interest rates, as well as business actions, including balance sheet optimization and managing deposit pricing, deepening of relationships with existing clients and an increase in new clients across segments. Securities services revenues of $3.9 billion increased 15%, as net interest income increased 59%, driven by higher interest rates across currencies, as well as the impact of foreign exchange translation, partially offset by a 1% decrease in non-interest revenue due to the impact of lower global financial markets.

Markets revenues of $19.1 billion increased 7% versus the prior year, largely driven by Fixed income markets, partially offset by lower client activity levels in Equity markets, as well as business actions to reduce RWA. Fixed income markets revenues of $14.6 billion increased 13%, driven by strength in rates and currencies. Equity markets revenues of $4.6 billion were down 9%, largely reflecting reduced client activity in equity derivatives versus the prior year.

Banking revenues of $6.1 billion decreased 35%, including the gain on loan hedges in the current year and loss on loan hedges in the prior year. Excluding the gain and loss on loan hedges, Banking revenues of $5.8 billion decreased 39%, driven by lower revenues in Investment banking and Corporate lending. Investment banking revenues of $3.1 billion decreased 53%, as heightened macroeconomic uncertainty and volatility continued to impact client activity. Excluding the gain and loss on loan hedges, Corporate lending revenues decreased 8% versus the prior year, driven by the impact of foreign currency translation, higher cost of funds and higher hedging costs.

For additional information on the results of operations of *ICG* in 2022, see "*Institutional Clients Group*" below.

Personal Banking and Wealth Management

PBWM net income of $3.3 billion decreased 57% versus the prior year, largely driven by a net ACL release in the prior year versus a net ACL build in the current year, as well as higher expenses. *PBWM* operating expenses of $16.3 billion increased 11%, primarily driven by continued investments in Citi's transformation, other risk and control initiatives, volume-related expenses and business-led investments, partially offset by productivity savings.

PBWM revenues of $24.2 billion increased 4% versus the prior year, as net interest income growth, driven by strong loan growth across Branded cards and Retail services and higher interest rates, was partially offset by a decline in non-interest revenue, driven by lower investment product revenue in Global Wealth and higher partner payments in Retail services.

U.S. Personal Banking revenues of $16.8 billion increased 7% versus the prior year. Branded cards revenues of $8.9 billion increased 9%, driven by higher net interest income. In Branded cards, new account acquisitions increased 11%, card spend volumes increased 16% and average loans increased 11%. Retail services revenues of $5.5 billion increased 7%, driven by higher net interest income, partially offset by higher partner payments. Retail banking revenues of $2.5 billion were largely unchanged versus the prior year, as higher interest income and modest deposit growth were offset by lower mortgage revenues due to fewer mortgage originations.

Global Wealth revenues of $7.4 billion decreased 2% versus the prior year, as investment product revenue headwinds, particularly in Asia, more than offset net interest income growth from higher interest rates and higher loan and deposit volumes.

For additional information on the results of operations of *PBWM* in 2022, see "*Personal Banking and Wealth Management*" below.

Legacy Franchises

Legacy Franchises net loss of $12 million compared to net income of $1 million in the prior year, primarily driven by higher cost of credit, partially offset by lower expenses and higher revenues, primarily reflecting the Philippines and Thailand gains on sales in the current year and the Australia loss on sale in the prior year. *Legacy Franchises* expenses of $7.8 billion decreased 6%, largely driven by the absence of the Korea VERP charge in the prior year and the benefit from closing the five exit markets, partially offset by the $535 million goodwill impairment, an approximate $70 million impairment of long-lived assets related to the Russia consumer banking business and $156 million of other aggregate divestiture-related costs.

Legacy Franchises revenues of $8.5 billion increased 3% versus the prior year, primarily driven by the Philippines and Thailand gains on sale versus the Australia loss on sale in the prior year. Excluding these divestiture-related impacts, revenues decreased 15%, primarily driven by the reduction in revenues from the closings of the five exit markets, as well as the impact of the ongoing Korea and Russia wind-downs.

For additional information on the results of operations of *Legacy Franchises* in 2022, see "*Legacy Franchises*" below.

Corporate/Other

Corporate/Other net income was $879 million, compared to a net loss of $8 million in the prior year, reflecting higher revenue and lower expenses, partially offset by lower income tax benefits, as well as the second quarter of 2022 release of a CTA (cumulative translation adjustment) loss (net of hedges) from *Accumulated other comprehensive income (loss) (AOCI)* related to the substantial liquidation of a legacy U.K. consumer operation, recorded in discontinued operations. *Corporate/Other* operating expenses of $953 million decreased 31%, primarily driven by lower consulting expenses and the impact of certain legal settlements.

Corporate/Other revenues of $1.4 billion increased from $0.5 billion in the prior year, driven by higher net interest income, primarily from the investment portfolio, partially offset by lower non-interest revenue, primarily due to the absence of mark-to-market gains in the prior year as well as higher hedging costs.

For additional information on the results of operations of *Corporate/Other* in 2022, see "*Corporate/Other*" below.

Macroeconomic and Other Risks and Uncertainties

Various geopolitical and macroeconomic challenges and uncertainties continue to adversely impact economic conditions in the U.S. and globally. The U.S. and other countries have continued to experience significantly elevated levels of inflation, resulting in central banks implementing a series of interest rates increases, with additional increases expected in the near term. In addition to causing a humanitarian crisis, the war in Ukraine continues to disrupt energy and food markets. An economic rebound in China remains uncertain, due to the ongoing impacts from COVID-19, the amount of leverage in its economy and stress in the property sector. These and other factors have adversely affected financial markets, negatively impacted global economic growth rates, contributed to lower consumer confidence and increased the risk of recession in Europe, the U.S. and other countries. These and other factors could adversely affect Citi's customers, clients, businesses, funding costs, expenses and results during 2023.

In addition, Citi could incur a significant loss on sale in 2023, due to CTA losses (net of hedges) in *AOCI*, goodwill write-offs and other *AOCI* loss components, related to the potential signing of a sale agreement for any of its remaining consumer banking divestitures. The majority of these losses would be regulatory capital neutral at closing.

For a further discussion of trends, uncertainties and risks that will or could impact Citi's businesses, results of operations, capital and other financial condition during 2023, see "2022 Results Summary" above and "Risk Factors," each respective business's results of operations and "Managing Global Risk," including "Managing Global Risk—Other Risks —Country Risk—Russia," below.

CITI'S CONSENT ORDER COMPLIANCE

Citi has embarked on a multiyear transformation, with the target outcome to change Citi's business and operating models such that they simultaneously strengthen risk and controls and improve Citi's value to customers, clients and shareholders.

This includes efforts to effectively implement the October 2020 Federal Reserve Board (FRB) and Office of the Comptroller of the Currency (OCC) consent orders issued to Citigroup and Citibank, respectively. In the second quarter of 2021, Citi made an initial submission to the OCC, and submitted its plans to address the consent orders to both regulators during the third quarter of 2021. Citi continues to work constructively with the regulators and provides to both regulators on an ongoing basis additional information regarding its plans and progress. Citi will continue to reflect their feedback in its project plans and execution efforts.

As discussed above, Citi's efforts include continued investments in its transformation, including the remediation of its consent orders. Citi's CEO has made the strengthening of Citi's risk and control environment a strategic priority and has established a Chief Administrative Officer organization to centralize program management. In addition, the Citigroup and Citibank Boards of Directors each formed a Transformation Oversight Committee, an ad hoc committee of each Board, to provide oversight of management's remediation efforts under the consent orders. The Citi Board of Directors has determined that Citi's plans are responsive to the Company's objectives and that progress continues to be made on execution of the plans.

For additional information about the consent orders, see "Risk Factors—Compliance Risks" below and Citi's Current Report on Form 8-K filed with the SEC on October 7, 2020.

RESULTS OF OPERATIONS

SUMMARY OF SELECTED FINANCIAL DATA

Citigroup Inc. and Consolidated Subsidiaries

In millions of dollars, except per share amounts	2022	2021	2020	2019	2018
Net interest income	$ **48,668**	$ 42,494	$ 44,751	$ 48,128	$ 47,744
Non-interest revenue	**26,670**	29,390	30,750	26,939	26,292
Revenues, net of interest expense	$ **75,338**	$ 71,884	$ 75,501	$ 75,067	$ 74,036
Operating expenses	**51,292**	48,193	44,374	42,783	43,023
Provisions for credit losses and for benefits and claims	**5,239**	(3,778)	17,495	8,383	7,568
Income from continuing operations before income taxes	$ **18,807**	$ 27,469	$ 13,632	$ 23,901	$ 23,445
Income taxes	**3,642**	5,451	2,525	4,430	5,357
Income from continuing operations	$ **15,165**	$ 22,018	$ 11,107	$ 19,471	$ 18,088
Income (loss) from discontinued operations, net of taxes	**(231)**	7	(20)	(4)	(8)
Net income before attribution of noncontrolling interests	$ **14,934**	$ 22,025	$ 11,087	$ 19,467	$ 18,080
Net income attributable to noncontrolling interests	**89**	73	40	66	35
Citigroup's net income	$ **14,845**	$ 21,952	$ 11,047	$ 19,401	$ 18,045
Earnings per share					
Basic					
Income from continuing operations	$ **7.16**	$ 10.21	$ 4.75	$ 8.08	$ 6.69
Net income	**7.04**	10.21	4.74	8.08	6.69
Diluted					
Income from continuing operations	$ **7.11**	$ 10.14	$ 4.73	$ 8.04	$ 6.69
Net income	**7.00**	10.14	4.72	8.04	6.68
Dividends declared per common share	**2.04**	2.04	2.04	1.92	1.54
Common dividends	$ **4,028**	$ 4,196	$ 4,299	$ 4,403	$ 3,865
Preferred dividends[1]	**1,032**	1,040	1,095	1,109	1,174
Common share repurchases	**3,250**	7,600	2,925	17,875	14,545

Table continues on the next page, including footnotes.

SUMMARY OF SELECTED FINANCIAL DATA
(Continued)

Citigroup Inc. and Consolidated Subsidiaries

In millions of dollars, except per share amounts, ratios and direct staff	2022	2021	2020	2019	2018
At December 31:					
Total assets	**$ 2,416,676**	$ 2,291,413	$ 2,260,090	$ 1,951,158	$ 1,917,383
Total deposits	**1,365,954**	1,317,230	1,280,671	1,070,590	1,013,170
Long-term debt	**271,606**	254,374	271,686	248,760	231,999
Citigroup common stockholders' equity	**182,194**	182,977	179,962	175,262	177,760
Total Citigroup stockholders' equity	**201,189**	201,972	199,442	193,242	196,220
Average assets	**2,396,023**	2,347,709	2,226,454	1,978,805	1,920,242
Direct staff *(in thousands)*	**240**	223	210	200	204
Performance metrics					
Return on average assets	**0.62 %**	0.94 %	0.50 %	0.98 %	0.94 %
Return on average common stockholders' equity[2]	**7.7**	11.5	5.7	10.3	9.4
Return on average total stockholders' equity[2]	**7.5**	10.9	5.7	9.9	9.1
Return on tangible common equity (RoTCE)[3]	**8.9**	13.4	6.6	12.1	11.0
Efficiency ratio (total operating expenses/total revenues, net)	**68.1**	67.0	58.8	57.0	58.1
Basel III ratios					
CET1 Capital[4]	**13.03 %**	12.25 %	11.51 %	11.79 %	11.86 %
Tier 1 Capital[4]	**14.80**	13.91	13.06	13.33	13.43
Total Capital[4]	**15.46**	16.04	15.33	15.87	16.14
Supplementary Leverage ratio	**5.82**	5.73	6.99	6.20	6.40
Citigroup common stockholders' equity to assets	**7.54 %**	7.99 %	7.96 %	8.98 %	9.27 %
Total Citigroup stockholders' equity to assets	**8.33**	8.81	8.82	9.90	10.23
Dividend payout ratio[5]	**29**	20	43	24	23
Total payout ratio[6]	**53**	56	73	122	109
Book value per common share	**$ 94.06**	$ 92.21	$ 86.43	$ 82.90	$ 75.05
Tangible book value (TBV) per share[3]	**81.65**	79.16	73.67	70.39	63.79

(1) Certain series of preferred stock have semiannual payment dates. See Note 21.

(2) The return on average common stockholders' equity is calculated using net income less preferred stock dividends divided by average common stockholders' equity. The return on average total Citigroup stockholders' equity is calculated using net income divided by average Citigroup stockholders' equity.

(3) RoTCE and TBV are non-GAAP financial measures. For information on RoTCE and TBV, see "Capital Resources—Tangible Common Equity, Book Value Per Share, Tangible Book Value Per Share and Returns on Equity" below.

(4) Citi's binding CET1 Capital and Tier 1 Capital ratios were derived under the Basel III Standardized Approach as of December 31, 2022, 2021, 2019 and 2018, and were derived under the Basel III Advanced Approaches framework as of December 31, 2020. Citi's binding Total Capital ratio was derived under the Basel III Advanced Approaches framework for all periods presented.

(5) Dividends declared per common share as a percentage of net income per diluted share.

(6) Total common dividends declared plus common share repurchases as a percentage of net income available to common shareholders (*Net income* less preferred dividends). See "Consolidated Statement of Changes in Stockholders' Equity," Note 10 and "Equity Security Repurchases" below for the component details.

SEGMENT REVENUES AND INCOME (LOSS)

REVENUES

In millions of dollars	2022	2021	2020	% Change 2022 vs. 2021	% Change 2021 vs. 2020
Institutional Clients Group	**$ 41,206**	$ 39,836	$ 41,093	**3 %**	(3)%
Personal Banking and Wealth Management	**24,217**	23,327	25,140	**4**	(7)
Legacy Franchises	**8,472**	8,251	9,454	**3**	(13)
Corporate/Other	**1,443**	470	(186)	**NM**	NM
Total Citigroup net revenues	**$ 75,338**	$ 71,884	$ 75,501	**5 %**	(5)%

NM Not meaningful

INCOME

In millions of dollars	2022	2021	2020	% Change 2022 vs. 2021	% Change 2021 vs. 2020
Income (loss) from continuing operations					
Institutional Clients Group	**$ 10,738**	$ 14,308	$ 10,811	**(25)%**	32 %
Personal Banking and Wealth Management	**3,319**	7,734	1,322	**(57)**	NM
Legacy Franchises	**(9)**	(9)	(142)	**—**	94
Corporate/Other	**1,117**	(15)	(884)	**NM**	98
Income from continuing operations	**$ 15,165**	$ 22,018	$ 11,107	**(31)%**	98 %
Discontinued operations	**$ (231)**	$ 7	$ (20)	**NM**	NM
Less: Net income attributable to noncontrolling interests	**89**	73	40	**22 %**	83 %
Citigroup's net income	**$ 14,845**	$ 21,952	$ 11,047	**(32)%**	99 %

NM Not meaningful

SEGMENT BALANCE SHEET[1]—DECEMBER 31, 2022

In millions of dollars	Institutional Clients Group	Personal Banking and Wealth Management	Legacy Franchises	Corporate/Other and consolidating eliminations[2]	Citigroup parent company-issued long-term debt and stockholders' equity[3]	Total Citigroup consolidated
Assets						
Cash and deposits with banks, net of allowance	$ 108,289	$ 6,411	$ 3,251	$ 224,074	$ —	$ 342,025
Securities borrowed and purchased under agreements to resell, net of allowance	364,673	425	303	—	—	365,401
Trading account assets	319,376	2,250	639	11,849	—	334,114
Investments, net of allowance	140,613	73	1,516	384,380	—	526,582
Loans, net of unearned income and allowance for credit losses on loans	279,337	324,260	36,650	—	—	640,247
Other assets, net of allowance	111,477	25,559	27,764	43,507	—	208,307
Net intersegment liquid assets[4]	406,143	134,852	26,592	(567,587)	—	—
Total assets	$ 1,729,908	$ 493,830	$ 96,715	$ 96,223	$ —	$ 2,416,676
Liabilities and equity						
Total deposits	$ 845,364	$ 437,813	$ 50,994	$ 31,783	$ —	$ 1,365,954
Securities loaned and sold under agreements to repurchase	199,895	80	2,469	—	—	202,444
Trading account liabilities	168,550	1,636	258	203	—	170,647
Short-term borrowings	34,785	2	4	12,305	—	47,096
Long-term debt[3]	93,219	189	75	11,866	166,257	271,606
Other liabilities	99,353	14,514	27,868	15,356	—	157,091
Net intersegment funding (lending)[3]	288,742	39,596	15,047	24,061	(367,446)	—
Total liabilities	$ 1,729,908	$ 493,830	$ 96,715	$ 95,574	$ (201,189)	$ 2,214,838
Total stockholders' equity[5]	—	—	—	649	201,189	201,838
Total liabilities and equity	$ 1,729,908	$ 493,830	$ 96,715	$ 96,223	$ —	$ 2,416,676

(1) The supplemental information presented in the table above reflects Citigroup's consolidated GAAP balance sheet by reportable segment and component. The respective segment information depicts the assets and liabilities managed by each segment.
(2) Consolidating eliminations for total Citigroup and Citigroup parent company assets and liabilities are recorded within *Corporate/Other*.
(3) Total stockholders' equity and the majority of long-term debt of Citigroup are reflected on the Citigroup parent company balance sheet (see Notes 18 and 30). Citigroup allocates stockholders' equity and long-term debt to its businesses through intersegment allocations as shown above.
(4) Represents the attribution of Citigroup's liquid assets (primarily consisting of cash, marketable equity securities and available-for-sale debt securities) to the various businesses based on Liquidity Coverage ratio (LCR) assumptions.
(5) *Corporate/Other* equity represents noncontrolling interests.

INSTITUTIONAL CLIENTS GROUP

Institutional Clients Group (ICG) includes Services, Markets and Banking (for additional information on these businesses, see "Citigroup Operating Segments" above). *ICG* provides corporate, institutional and public sector clients around the world with a full range of wholesale banking products and services, including fixed income and equity sales and trading, foreign exchange, prime brokerage, derivative services, equity and fixed income research, corporate lending, investment banking and advisory services, cash management, trade finance and securities services. *ICG* transacts with clients in both cash instruments and derivatives, including fixed income, foreign currency, equity and commodity products.

ICG's revenue is generated primarily from fees and spreads associated with these activities. *ICG* earns fee income for assisting clients with transactional services and clearing and providing brokerage and investment banking services and other such activities. Such fees are recognized at the point in time when Citigroup's performance under the terms of a contractual arrangement is completed, which is typically at the trade/execution date or closing of a transaction. Revenue generated from these activities is recorded in *Commissions and fees* and *Investment banking fees*. Revenue is also generated from assets under custody and administration, which is recognized as/when the associated promised service is satisfied, which normally occurs at the point in time the service is requested by the customer and provided by Citi. Revenue generated from these activities is primarily recorded in *Administration and other fiduciary fees*. For additional information on these various types of revenues, see Note 5.

In addition, as a market maker, *ICG* facilitates transactions, including holding product inventory to meet client demand, and earns the differential between the price at which it buys and sells the products. These price differentials and the unrealized gains and losses on the inventory are recorded in *Principal transactions*. Mark-to-market gains and losses on certain credit derivatives (used to economically hedge the corporate loan portfolio) are also recorded in *Principal transactions* (for additional information on *Principal transactions* revenue, see Note 6). *Other* primarily includes realized gains and losses on available-for-sale (AFS) debt securities, gains and losses on equity securities not held in trading accounts and other non-recurring gains and losses. Interest income earned on assets held, less interest paid on long- and short-term debt, secured funding transactions and customers deposits, is recorded as *Net interest income*.

The amount and types of Markets revenues are impacted by a variety of interrelated factors, including market liquidity; changes in market variables such as interest rates, foreign exchange rates, equity prices, commodity prices and credit spreads, as well as their implied volatilities; investor confidence and other macroeconomic conditions. Assuming all other market conditions do not change, increases in client activity levels or bid/offer spreads generally result in increases in revenues. However, changes in market conditions can significantly impact client activity levels, bid/offer spreads and the fair value of product inventory. For example, a decrease in market liquidity may increase bid/offer spreads, decrease client activity levels and widen credit spreads on product inventory positions. *ICG*'s management of the Markets businesses involves daily monitoring and evaluation of the above factors at the trading desk as well as the country level.

In the Markets businesses, client revenues are those revenues directly attributable to client transactions at the time of inception, including commissions, interest or fees earned. Client revenues do not include the results of client facilitation activities (e.g., holding product inventory in anticipation of client demand) or the results of certain economic hedging activities.

ICG's international presence is supported by trading floors in approximately 80 countries and a proprietary network in 95 countries and jurisdictions. As previously disclosed, Citi intends to end nearly all of the institutional banking services it offers in Russia by the end of the first quarter of 2023. Going forward, Citi's only operations in Russia will be those necessary to fulfill its remaining legal and regulatory obligations. At this time, the estimated cost to be incurred in relation to this action is approximately $80 million (excluding the impact from any portfolio sales), primarily through 2024. For additional information about Citi's continued efforts to reduce its operations and exposure in Russia, see "*Legacy Franchises*" and "Managing Global Risk—Other Risks—Country Risk—Russia" below.

At December 31, 2022, *ICG* had $1.7 trillion in assets and $845 billion in deposits. Securities services managed $22.2 trillion in assets under custody and administration at December 31, 2022, of which Citi provided both custody and administrative services to certain clients related to $1.9 trillion of such assets. Managed assets under trust were $4.0 trillion at December 31, 2022. For additional information on these operations, see "Administration and Other Fiduciary Fees" in Note 5.

In millions of dollars, except as otherwise noted	2022	2021	2020	% Change 2022 vs. 2021	% Change 2021 vs. 2020
Commissions and fees	$ 4,404	$ 4,300	$ 3,961	2 %	9 %
Administration and other fiduciary fees	2,684	2,693	2,348	—	15
Investment banking fees[1]	3,573	6,709	4,982	(47)	35
Principal transactions	13,633	9,763	12,916	40	(24)
Other	(999)	1,372	1,136	NM	21
Total non-interest revenue	$ 23,295	$ 24,837	$ 25,343	(6)%	(2)%
Net interest income (including dividends)	17,911	14,999	15,750	19	(5)
Total revenues, net of interest expense	$ 41,206	$ 39,836	$ 41,093	3 %	(3)%
Total operating expenses[2]	$ 26,299	$ 23,949	$ 22,336	10 %	7 %

Net credit losses on loans	$	**152**	$	356	$	877	**(57)%**	(59)%
Credit reserve build (release) for loans		**478**		(2,093)		2,582	**NM**	NM
Provision (release) for credit losses on unfunded lending commitments		**187**		(753)		1,390	**NM**	NM
Provisions for credit losses on HTM debt securities and other assets		**94**		—		20	**—**	100
Provisions (releases) for credit losses	$	**911**	$	(2,490)	$	4,869	**NM**	NM
Income from continuing operations before taxes	$	**13,996**	$	18,377	$	13,888	**(24)%**	32 %
Income taxes		**3,258**		4,069		3,077	**(20)**	32
Income from continuing operations	$	**10,738**	$	14,308	$	10,811	**(25)%**	32 %
Noncontrolling interests		**79**		83		50	**(5)**	66
Net income	$	**10,659**	$	14,225	$	10,761	**(25)%**	32 %
Balance Sheet data *(in billions of dollars)*								
EOP assets	$	**1,730**	$	1,613	$	1,592	**7 %**	1 %
Average assets		**1,716**		1,669		1,566	**3**	7
Efficiency ratio		**64 %**		60 %		54 %		
Average loans by reporting unit *(in billions of dollars)*								
Services	$	**82**	$	75	$	70	**9 %**	7 %
Banking		**196**		196		217	**—**	(10)
Markets		**13**		16		11	**(19)**	45
Total	$	**291**	$	287	$	298	**1 %**	(4)%
Average deposits by reporting unit *(in billions of dollars)*								
TTS	$	**675**	$	670	$	646	**1 %**	4 %
Securities services		**133**		135		108	**(1)**	25
Services	$	**808**	$	805	$	754	**— %**	7 %
Markets and Banking		**22**		23		26	**(4)**	(12)
Total	$	**830**	$	828	$	780	**— %**	6 %

(1) Investment banking fees are substantially composed of underwriting and advisory revenues.
(2) 2020 includes an approximate $390 million operational loss related to certain legal matters. 2022 includes a Revlon-related wire transfer recovery.
NM Not meaningful

ICG Revenue Details

In millions of dollars	2022	2021	2020	% Change 2022 vs. 2021	% Change 2021 vs. 2020
Services					
Net interest income	$ 9,722	$ 6,595	$ 7,581	47 %	(13)%
Non-interest revenue	6,300	5,987	5,165	5	16
Total Services revenues	$ 16,022	$ 12,582	$ 12,746	27 %	(1)%
Net interest income	$ 8,306	$ 5,706	$ 6,524	46 %	(13)%
Non-interest revenue	3,857	3,509	3,004	10	17
TTS revenues	$ 12,163	$ 9,215	$ 9,528	32 %	(3)%
Net interest income	$ 1,416	$ 889	$ 1,057	59 %	(16)%
Non-interest revenue	2,443	2,478	2,161	(1)	15
Securities services revenues	$ 3,859	$ 3,367	$ 3,218	15 %	5 %
Markets					
Net interest income	$ 5,164	$ 5,161	$ 5,182	— %	— %
Non-interest revenue	13,949	12,715	15,932	10	(20)
Total Markets revenues[1]	$ 19,113	$ 17,876	$ 21,114	7 %	(15)%
Fixed income markets	$ 14,555	$ 12,880	$ 17,040	13 %	(24)%
Equity markets	4,558	4,996	4,074	(9)	23
Total Markets revenues	$ 19,113	$ 17,876	$ 21,114	7 %	(15)%
Rates and currencies	$ 11,743	$ 8,793	$ 12,057	34 %	(27)%
Spread products / other fixed income	2,812	4,087	4,983	(31)	(18)
Total Fixed income markets revenues	$ 14,555	$ 12,880	$ 17,040	13 %	(24)%
Banking					
Net interest income	$ 3,025	$ 3,243	$ 2,987	(7)%	9 %
Non-interest revenue	3,046	6,135	4,246	(50)	44
Total Banking revenues	$ 6,071	$ 9,378	$ 7,233	(35)%	30 %
Investment banking					
Advisory	$ 1,365	$ 1,796	$ 1,010	(24)%	78 %
Equity underwriting	611	2,249	1,423	(73)	58
Debt underwriting	1,133	2,586	2,173	(56)	19
Total Investment banking revenues	$ 3,109	$ 6,631	$ 4,606	(53)%	44 %
Corporate lending (excluding gains (losses) on loan hedges)[2]	$ 2,655	$ 2,887	$ 2,686	(8)%	7 %
Total Banking revenues (excluding gains (losses) on loan hedges)[2]	$ 5,764	$ 9,518	$ 7,292	(39)%	31 %
Gain (loss) on loan hedges[2]	307	(140)	(59)	NM	NM
Total Banking revenues (including gains (losses) on loan hedges)[2]	$ 6,071	$ 9,378	$ 7,233	(35)%	30 %
Total *ICG* revenues, net of interest expense	$ 41,206	$ 39,836	$ 41,093	3 %	(3)%

(1) Citi assesses its Markets business performance on a total revenue basis, as offsets may occur across revenue line items. For example, securities that generate *Net interest income* may be risk managed by derivatives that are recorded in *Principal transactions* revenue within *Non-interest revenue*. For a description of the composition of these revenue line items, see Notes 4, 5 and 6.

(2) Credit derivatives are used to economically hedge a portion of the corporate loan portfolio that includes both accrual loans and loans at fair value. Gain (loss) on loan hedges include the mark-to-market on the credit derivatives and the mark-to-market on the loans in the portfolio that are at fair value. The fixed premium costs of these hedges are netted against the corporate lending revenues to reflect the cost of credit protection. Citigroup's results of operations excluding the impact of gain (loss) on loan hedges are non-GAAP financial measures.

NM Not meaningful

The discussion of the results of operations for ICG below excludes (where noted) the impact of any gain (loss) on hedges of accrual loans, which are non-GAAP financial measures. For a reconciliation of these metrics to the reported results, see the table above.

2022 vs. 2021

Net income of $10.7 billion decreased 25%, primarily driven by substantially higher cost of credit and higher expenses, partially offset by higher revenues.

Revenues increased 3% (including gain (loss) on loan hedges), primarily reflecting higher Services and Markets revenues, partially offset by lower Banking revenues. Services revenues were up 27%, driven by higher revenues in both TTS and Securities services. Markets revenues were up 7%, primarily driven by higher Fixed income markets revenues, partially offset by lower Equity markets revenues and the impact of business actions taken to reduce RWA.

Banking revenues were down 35% (39% excluding the impact of gain (loss) on loan hedges), reflecting lower revenues in both Investment banking and Corporate lending.

Citi expects that revenues in its Markets and Investment banking businesses will continue to reflect the overall market environment during 2023.

Within Services:

- TTS revenues increased 32%, driven by 46% growth in net interest income and 10% growth in non-interest revenue, driven by deepening of existing client relations and gaining new clients across segments. The increase in net interest income was driven by both the cash and trade businesses, reflecting benefits from higher interest rates, balance sheet optimization, higher average deposits and higher average loans. Average deposits grew 1%, as volume growth was partially offset by the impact of foreign exchange translation. Average loans grew 11%, primarily driven by the strength in trade flows in Asia and Latin America, partially offset by loan sales in North America. Strong non-interest revenues growth across both cash and trade businesses reflected client engagement and growth from underlying drivers, including higher U.S. dollar clearing volumes (up 2%), cross-border flows (up 11%) and commercial card spend (up 49%).
- Securities services revenues increased 15%, primarily driven by an increase in net interest income, reflecting higher interest rates across currencies as well as the impact of foreign exchange translation. Non-interest revenues decreased 1%, due to the impact of foreign exchange translation and lower fees in the custody business tied to lower assets under custody and administration (decline of 7%), driven by declines in global financial markets. The decline in non-interest revenues was partially offset by continued elevated levels of corporate activity in issuer services and new client onboarding of $1.2 trillion in assets under custody and administration. Average deposits declined 7%, due to clients seeking higher rate alternatives.

Within Markets:

- Fixed income markets revenues increased 13%, driven by growth in rates and currencies across all regions, due to strong corporate and investor client engagement, partially offset by a decline in spread products, primarily driven by North America.
- Rates and currencies revenues increased 34%, reflecting increased market volatility, driven by rising interest rates and quantitative tightening, as central banks responded to elevated levels of inflation. Spread products and other fixed income revenues decreased 31%, due to continued lower client activity across spread products and a challenging credit market due to widening spreads for most of the year. The decline in spread products and other fixed income revenues was partially offset by strength in commodities, particularly with corporate clients, as the business assisted those clients in managing risk associated with the increased volatility.
- Equity markets revenues decreased 9%, driven by equity derivatives, primarily reflecting lower activity by both corporate and institutional clients compared to a strong prior year. The lower revenues also reflected a decline in equity cash, driven by lower client activity.

Within Banking:

- Investment banking revenues were down 53%, reflecting a significant decline in the overall market wallet and loss in wallet share, as heightened macroeconomic uncertainty and volatility continued to impact client activity. Advisory revenues decreased 24%, reflecting a decline in North America and EMEA, driven by the decline in the market wallet as well as loss in wallet share. Equity and debt underwriting revenues decreased 73% and 56% respectively, reflecting a decline in North America, EMEA and Asia and driven by the decline in the market wallet as well as wallet share loss. The decline in debt underwriting revenues also reflected markdowns on loan commitments and losses on loan sales.
- Corporate lending revenues increased 8%, including the impact of gain (loss) on loan hedges. Excluding the impact of gain (loss) on loan hedges, revenues decreased 8%, primarily driven by the impacts of foreign currency translation, higher cost of funds and higher hedging costs.

Expenses were up 10%, primarily driven by continued investment in Citi's transformation, business-led investments and volume-related expenses, partially offset by a Revlon-related wire transfer recovery, the impact of foreign exchange translation and productivity savings.

Provisions were $911 million, compared to a benefit of $2.5 billion in the prior year, driven by an ACL build, partially offset by lower net credit losses.

Net credit losses declined to $152 million, compared to $356 million in the prior year, driven by improvements in portfolio credit quality.

The ACL build was $759 million, compared to a release of $2.8 billion in the prior year. The ACL build was primarily driven by a deterioration in macroeconomic assumptions. For additional information on Citi's ACL, see "Significant Accounting Policies and Significant Estimates" below.

For additional information on *ICG*'s corporate credit portfolio, see "Managing Global Risk—Credit Risk—Corporate Credit" below.

For additional information on trends in *ICG*'s deposits and loans, see "Managing Global Risk—Liquidity Risk—Loans" and "—Deposits" below.

For additional information about trends, uncertainties and risks related to *ICG*'s future results, see "Executive Summary" above and "Risk Factors" and "Managing Global Risk—Other Risks—Country Risk—Argentina" and "—Russia" below.

PERSONAL BANKING AND WEALTH MANAGEMENT

Personal Banking and Wealth Management (PBWM) consists of U.S. Personal Banking and Global Wealth Management (Global Wealth). U.S. Personal Banking includes Retail banking, which provides traditional banking services to retail and small business customers. U.S. Personal Banking's cards portfolio includes the following proprietary portfolios: Cash, Rewards and Value portfolios and co-branded cards (including, among others, American Airlines and Costco) within Branded cards, and co-brand and private label relationships (including, among others, The Home Depot, Best Buy, Sears and Macy's) within Retail services. Global Wealth includes Private bank, Wealth at Work and Citigold and provides financial services to clients from affluent to ultra-high-net-worth through banking, lending, mortgages, investment, custody and trust product offerings in 20 countries, including the U.S., Mexico and four wealth management centers: Singapore, Hong Kong, the UAE and London.

At December 31, 2022, U.S. Personal Banking had 654 retail bank branches concentrated in the six key metropolitan areas of New York, Chicago, Los Angeles, San Francisco, Miami and Washington, D.C. U.S. Personal Banking had $151 billion in outstanding credit card balances, $113 billion in deposits and $37 billion in retail banking loans.

At December 31, 2022, Global Wealth had $325 billion in deposits, $84 billion in mortgage loans, $61 billion in personal and small business loans and $5 billion in outstanding credit card balances.

In millions of dollars, except as otherwise noted	2022	2021	2020	% Change 2022 vs. 2021	% Change 2021 vs. 2020
Net interest income	$ 22,656	$ 20,646	$ 22,326	10 %	(8)%
Non-interest revenue	1,561	2,681	2,814	(42)	(5)
Total revenues, net of interest expense	$ 24,217	$ 23,327	$ 25,140	4 %	(7)%
Total operating expenses	$ 16,258	$ 14,610	$ 13,599	11 %	7 %
Net credit losses on loans	$ 3,021	$ 3,061	$ 5,229	(1)%	(41)%
Credit reserve build (release) for loans	707	(4,284)	4,613	NM	NM
Provision (release) for credit losses on unfunded lending commitments	11	(16)	26	NM	NM
Provisions for benefits and claims (PBC), and other assets	15	15	17	—	(12)
Provisions (release) for credit losses and PBC	$ 3,754	$ (1,224)	$ 9,885	NM	NM
Income from continuing operations before taxes	$ 4,205	$ 9,941	$ 1,656	(58)%	NM
Income taxes	886	2,207	334	(60)	NM
Income from continuing operations	$ 3,319	$ 7,734	$ 1,322	(57)%	NM
Noncontrolling interests	—	—	—	—	— %
Net income	$ 3,319	$ 7,734	$ 1,322	(57)%	NM
Balance Sheet data *(in billions of dollars)*					
EOP assets	$ 494	$ 464	$ 453	6 %	2 %
Average assets	476	467	454	2	3
Average loans	321	307	304	5	1
Average deposits	435	417	358	4	16
Efficiency ratio	67 %	63 %	54 %		
Net credit losses as a percentage of average loans	0.94	1.00	1.72		
Revenue by reporting unit and component					
Branded cards	$ 8,892	$ 8,190	$ 8,799	9 %	(7)%
Retail services	5,450	5,082	5,965	7	(15)
Retail banking	2,501	2,506	2,790	—	(10)
U.S. Personal Banking	$ 16,843	$ 15,778	$ 17,554	7 %	(10)%
Private bank	$ 2,762	$ 2,943	$ 2,882	(6)%	2 %
Wealth at Work	730	691	677	6	2
Citigold	3,882	3,915	4,027	(1)	(3)
Global Wealth	$ 7,374	$ 7,549	$ 7,586	(2)%	— %
Total	$ 24,217	$ 23,327	$ 25,140	4 %	(7)%

NM Not meaningful

2022 vs. 2021

Net income was $3.3 billion, compared to $7.7 billion in the prior year, reflecting significantly higher cost of credit and higher expenses, partially offset by higher revenues.

Revenues increased 4%, primarily due to higher net interest income, driven by strong loan growth in Branded cards and Retail services and higher interest rates. The increase was partially offset by lower non-interest revenue, reflecting lower investment product revenue in Global Wealth and higher partner payments in Retail services resulting from higher revenues.

U.S. Personal Banking revenues increased 7%, reflecting higher revenues in cards.

Cards revenues increased 8%. Branded cards revenues increased 9%, primarily driven by higher net interest income on higher loan balances. Branded cards new account acquisitions increased 11% and card spend volume increased 16%. Average loans increased 11%, reflecting the higher card spend volumes.

Retail services revenues increased 7%, primarily driven by higher net interest income on higher loan balances and lower payment rates, partially offset by the increase in partner payments. The increase in partner payments reflected higher income sharing as a result of higher revenues (for additional information on partner payments, see Note 5). Retail services credit card spend volume increased 8% and average loans increased 6%, reflecting the higher card spend volumes.

Retail banking revenues were largely unchanged, as the higher interest rates and modest deposit growth were offset by lower mortgage revenues due to fewer mortgage originations, driven by the higher interest rates. Average deposits increased 3%, largely reflecting higher levels of consumer liquidity in the first half of 2022.

Global Wealth revenues decreased 2%, reflecting investment product revenue headwinds, particularly in Asia, driven by overall market volatility, partially offset by net interest income growth, driven by higher interest rates and higher loan and deposit volumes. Average loans increased 2% and average deposits increased 5%. Client assets decreased 8%, primarily driven by declines in equity market valuations. Global Wealth advisors increased 4% during 2022. Private bank revenues decreased 6%, Citigold revenues decreased 1% and Wealth at Work revenues increased 6%.

Expenses increased 11%, primarily driven by continued investments in Citi's transformation, other risk and control initiatives, volume-related expenses and business-led investments, partially offset by productivity savings.

Provisions were $3.8 billion, compared to a benefit of $1.2 billion in the prior year, largely driven by a net ACL build. Net credit losses decreased 1%, driven by historically low loss rates experienced in the first half of 2022, followed by the ongoing normalization of losses toward pre-pandemic levels, particularly in Retail services (net credit losses up 7% to $1.3 billion). Branded cards net credit losses declined 17% to $1.4 billion.

The net ACL build was $0.7 billion, compared to a net release of $4.3 billion in the prior year, primarily driven by U.S. Cards loan growth and a deterioration in macroeconomic assumptions. For additional information on Citi's ACL, see "Significant Accounting Policies and Significant Estimates" below.

For additional information on U.S. Personal Banking's Retail banking, and its Branded cards and Retail services portfolios, see "Credit Risk—Consumer Credit" below.

For additional information about trends, uncertainties and risks related to *PBWM*'s future results, see "Executive Summary" above and "Risk Factors" below.

LEGACY FRANCHISES

As of December 31, 2022, *Legacy Franchises* included (i) Asia Consumer Banking (Asia Consumer), representing the consumer banking operations of the remaining eight Asia and EMEA exit countries; (ii) Mexico Consumer Banking (Mexico Consumer) and Mexico Small Business and Middle-Market Banking (Mexico SBMM), collectively Mexico Consumer/SBMM, which Citi also plans to exit; and (iii) Legacy Holdings Assets (certain North America consumer mortgage loans and other legacy assets). Asia Consumer provides traditional retail banking and branded card products to retail and small business customers. Mexico Consumer/SBMM provides traditional retail banking and branded card products to consumers and small business customers and traditional middle-market banking products and services to commercial customers through Citibanamex.

Legacy Franchises also included the following consumer banking businesses prior to their sale: Australia, until its closing on June 1, 2022; the Philippines, until its closing on August 1, 2022; Thailand and Malaysia, until their closings on November 1, 2022; and Bahrain, until its closing on December 1, 2022. In addition, Citi has entered into agreements to sell its consumer banking businesses in India, Indonesia, Taiwan and Vietnam, and announced its wind-down of consumer banking operations in Korea and China and consumer banking and local commercial banking operations in Russia (see below). In December 2022, Citi announced the pursuit of sales of portfolios within its China consumer banking business, subject to applicable regulations. See Note 2 for additional information on *Legacy Franchises*' consumer banking business sales and wind-downs.

As previously disclosed, Citi announced the wind-down of its consumer banking and local commercial banking operations in Russia, including its active pursuit of sales of certain Russia consumer banking portfolios. In connection with this wind-down plan, Citi expects to incur approximately $110 million in costs (excluding the impact from any portfolio sales), primarily through 2024, largely driven by restructuring, vendor termination fees and other related charges. In December 2022, Citi (i) sold a portfolio of ruble-denominated personal installment loans, totaling approximately $240 million in outstanding loan balances as of the fourth quarter of 2022 and (ii) entered into a referral agreement to settle a portfolio of ruble-denominated credit card loans, subject to customer consents; the outstanding card loans balance was approximately $219 million as of the fourth quarter of 2022. For additional information about Citi's continued efforts to reduce its operations and exposure in Russia, see "*Institutional Clients Group*" above and "Risk Factors" and "Managing Global Risk—Other Risks—Country Risk—Russia" below.

At December 31, 2022, on a combined basis, *Legacy Franchises* had 1,438 retail branches, $23 billion in retail banking loans and $51 billion in deposits. In addition, the businesses had $8 billion in outstanding card loan balances, and Mexico SBMM had $7 billion in outstanding corporate loan balances. These amounts exclude approximately $12 billion of loans ($9 billion of retail banking loans and $3 billion of credit card loan balances) and approximately $16 billion of deposits, all of which were reclassified to *Other assets* and *Other liabilities* held-for-sale (HFS) as a result of Citi's agreements to sell its consumer banking businesses in India, Indonesia, Taiwan and Vietnam. See Note 2 for additional information.

In millions of dollars, except as otherwise noted	2022	2021	2020	% Change 2022 vs. 2021	% Change 2021 vs. 2020
Net interest income	$ 5,691	$ 6,250	$ 6,973	(9)%	(10)%
Non-interest revenue	2,781	2,001	2,481	39	(19)
Total revenues, net of interest expense	$ 8,472	$ 8,251	$ 9,454	3 %	(13)%
Total operating expenses	$ 7,782	$ 8,259	$ 6,890	(6)%	20 %
Net credit losses on loans	$ 616	$ 1,478	$ 1,505	(58)%	(2)%
Credit reserve build (release) for loans	(229)	(1,621)	1,116	86	NM
Provision (release) for credit losses on unfunded lending commitments	93	(19)	30	NM	NM
Provisions for benefits and claims (PBC), HTM debt securities and other assets	91	100	88	(9)	14
Provisions (releases) for credit losses and PBC	$ 571	$ (62)	$ 2,739	NM	NM
Income (loss) from continuing operations before taxes	$ 119	$ 54	$ (175)	NM	NM
Income taxes	128	63	(33)	NM	NM
Income (loss) from continuing operations	$ (9)	$ (9)	$ (142)	— %	94 %
Noncontrolling interests	3	(10)	(6)	NM	(67)
Net income (loss)	$ (12)	$ 1	$ (136)	NM	101 %
Balance Sheet data *(in billions of dollars)*					
EOP assets	$ 97	$ 125	$ 131	(22)%	(5)%
Average assets	110	127	128	(13)	(1)
EOP loans	38	65	84	(42)	(23)
EOP deposits	51	76	90	(33)	(16)
Efficiency ratio	92 %	100 %	73 %		
Revenue by reporting unit and component					
Asia Consumer	$ 3,811	$ 3,405	$ 4,311	12 %	(21)%
Mexico Consumer/SBMM	4,751	4,651	4,885	2	(5)
Legacy Holdings Assets	(90)	195	258	NM	(24)
Total	$ 8,472	$ 8,251	$ 9,454	3 %	(13)%

NM Not meaningful

2022 vs. 2021

Net loss was $12 million, compared to net income of $1 million in the prior year, primarily driven by higher cost of credit, partially offset by lower expenses and higher revenues.

Results for 2022 included divestiture-related impacts of approximately $87 million (approximately $(180) million after-tax), which primarily consisted of (i) an approximate $618 million Philippines gain on sale recorded in revenues, (ii) an approximate $209 million Thailand gain on sale recorded in revenues, (iii) an approximate $(64) million incremental Australia consumer banking loss on sale recorded in revenues, (iv) an approximate $535 million goodwill impairment recorded in expenses and (v) an approximate $156 million of other aggregate divestiture-related costs.

Results for 2021 included divestiture-related impacts of approximately $(1.9) billion (approximately $(1.6) billion after-tax), which primarily consisted of (i) an approximate $(694) million Australia loss on sale recorded in revenues, (ii) an approximate $1.1 billion related to charges incurred from the voluntary early retirement program (VERP) in connection with the wind-down of the Korea consumer banking business recorded in expenses and (iii) contract modification costs related to the Asia divestitures of approximately $119 million recorded in expenses.

Revenues increased 3%, primarily driven by higher revenues in Asia Consumer and Mexico Consumer/SBMM, partially offset by lower Legacy Holdings Assets revenues.

Asia Consumer revenues increased 12%, primarily driven by the Philippines and Thailand gains on sale, versus the Australia loss on sale in the prior year, partially offset by the loss of revenues from the closing of the five exit markets and impacts of the ongoing Korea and Russia wind-downs.

Mexico Consumer/SBMM revenues increased 2%, as cards revenues in Mexico Consumer increased 7% and SBMM revenues increased 9%, primarily due to higher interest rates and higher deposit and loan growth. The increase in revenues was partially offset by a 1% decrease in retail banking revenues, primarily driven by lower fiduciary fees reflecting declines in equity market valuations.

Legacy Holdings Assets revenues of $(90) million decreased from $195 million in the prior year, largely driven by a CTA loss (net of hedges) recorded in *AOCI* in the second quarter of 2022, related to the substantial liquidation of a legacy U.K. consumer operation (for additional information, see "*Corporate/Other*" below and Note 2), as well as the continued wind-down of Legacy Holdings Assets.

Expenses decreased 6%, primarily driven by the absence of the $1.2 billion divestiture-related costs in the prior year, including the Korea VERP of approximately $1.1 billion and contract modification costs related to Asia divestiture markets of approximately $119 million, and the benefit from the closing of the five exit markets. The decline was partially offset by an approximate $535 million goodwill impairment in the first quarter of 2022, an approximate $70 million impairment of long-lived assets related to the Russia consumer banking business in the second quarter of 2022 and approximately $156 million of other aggregate divestiture-related costs.

Provisions were $571 million, compared to a benefit of $62 million in the prior year, primarily driven by a lower net ACL release, partially offset by lower net credit losses. Net credit losses decreased 58%, primarily reflecting improved delinquencies in both Asia Consumer and Mexico Consumer and the reclassification of loans and net credit losses to reflect HFS accounting as a result of the signing of sale agreements for the aforementioned consumer banking businesses in Asia Consumer.

The net ACL release was $136 million, compared to a net release of $1.6 billion in the prior year. The continued release primarily reflected further improvement in portfolio credit quality. For additional information on Citi's ACL, see "Significant Accounting Policies and Significant Estimates" below.

For additional information about trends, uncertainties and risks related to *Legacy Franchises*' future results, see "Executive Summary" above and "Risk Factors" and "Managing Global Risk—Other Risks—Country Risk—Russia" below.

CORPORATE/OTHER

Activities not assigned to the operating segments (*ICG*, *PBWM* and *Legacy Franchises*) are included in *Corporate/Other*. *Corporate/Other* included certain unallocated costs of global staff functions (including finance, risk, human resources, legal and compliance-related costs), other corporate expenses and unallocated global operations and technology expenses and income taxes, as well as results of Corporate Treasury investment activities and discontinued operations. At December 31, 2022, *Corporate/Other* had $96 billion in assets, primarily related to the investment securities.

In millions of dollars	2022	2021	2020	% Change 2022 vs. 2021	% Change 2021 vs. 2020
Net interest income	$ 2,410	$ 599	$ (298)	NM	NM
Non-interest revenue	(967)	(129)	112	NM	NM
Total revenues, net of interest expense	$ 1,443	$ 470	$ (186)	NM	NM
Total operating expenses	$ 953	$ 1,375	$ 1,549	(31)%	(11)%
Provisions (releases) for HTM debt securities and other assets	$ 3	$ (2)	$ 2	NM	NM
Income (loss) from continuing operations before taxes	$ 487	$ (903)	$ (1,737)	NM	48 %
Income taxes (benefits)	(630)	(888)	(853)	29 %	(4)
Income (loss) from continuing operations	$ 1,117	$ (15)	$ (884)	NM	98 %
Income (loss) from discontinued operations, net of taxes	(231)	7	(20)	NM	NM
Net income (loss) before attribution of noncontrolling interests	$ 886	$ (8)	$ (904)	NM	99 %
Noncontrolling interests	7	—	(4)	— %	100
Net income (loss)	$ 879	$ (8)	$ (900)	NM	99 %

NM Not meaningful

2022 vs. 2021

Net income was $879 million, compared to a net loss of $8 million in the prior year, reflecting higher revenues and lower expenses, partially offset by lower income tax benefits and a second quarter of 2022 release of a CTA loss (net of hedges) from *AOCI*, recorded in discontinued operations, related to the substantial liquidation of a U.K. consumer legacy operation (for additional information, see "*Legacy Franchises*" above and Note 2).

Revenues were $1.4 billion, compared to $470 million in the prior year, driven by higher net interest income, partially offset by lower non-interest revenue. The higher net interest income was primarily due to the investment portfolio driven by higher balances, higher interest rates and lower mortgage-backed securities prepayments, partially offset by higher cost of funds related to higher institutional certificates of deposit. The lower non-interest revenue was primarily due to the absence of mark-to-market gains in the prior year as well as higher hedging costs.

Expenses decreased 31%, primarily driven by lower consulting expenses and the impact of certain legal settlements.

For additional information about trends, uncertainties and risks related to *Corporate/Other*'s future results, see "Executive Summary" above and "Risk Factors" below.

CAPITAL RESOURCES

Overview

Capital is used principally to support assets in Citi's businesses and to absorb potential losses, including credit, market and operational losses. Citi primarily generates capital through earnings from its operating businesses. Citi may augment its capital through issuances of common stock and noncumulative perpetual preferred stock, among other issuances. Further, Citi's capital levels may also be affected by changes in accounting and regulatory standards, as well as the impact of future events on Citi's business results, such as the signing or closing of divestitures and changes in interest and foreign exchange rates.

During 2022, Citi returned a total of $7.3 billion of capital to common shareholders in the form of $4.0 billion in dividends and $3.3 billion in share repurchases totaling approximately 56 million common shares. Citi has continued to pause common share repurchases in order to absorb any temporary capital impacts related to any potential signing of a sale agreement for its Mexico Consumer and Small Business and Middle-Market Banking (Mexico Consumer/SBMM) business (for additional information, see "Executive Summary —Macroeconomic and Other Risks and Uncertainties" above) and to continue to have ample capital to serve its clients. For additional information on capital-related trends, uncertainties and risks related to Citi's exit businesses, including the impact of CTA losses, see "Executive Summary" above and "Risk Factors—Strategic Risks" and "—Operational Risks" below.

Capital Management

Citi's capital management framework is designed to ensure that Citigroup and its principal subsidiaries maintain sufficient capital consistent with each entity's respective risk profile, management targets and all applicable regulatory standards and guidelines. Citi assesses its capital adequacy against a series of internal quantitative capital goals, designed to evaluate its capital levels in expected and stressed economic environments. Underlying these internal quantitative capital goals are strategic capital considerations, centered on preserving and building financial strength.

The Citigroup Capital Committee, with oversight from the Risk Management Committee of Citigroup's Board of Directors, has responsibility for Citi's aggregate capital structure, including the capital assessment and planning process, which is integrated into Citi's capital plan. Balance sheet management, including oversight of capital adequacy, for Citigroup and its subsidiaries is governed by each entity's Asset and Liability Committee, where applicable.

For additional information regarding Citi's capital planning and stress testing exercises, see "Stress Testing Component of Capital Planning" below.

Current Regulatory Capital Standards

Citi is subject to regulatory capital rules issued by the Federal Reserve Board (FRB), in coordination with the OCC and FDIC, including the U.S. implementation of the Basel III rules (for information on potential changes to the Basel III rules, see "Basel III Revisions" below). These rules establish an integrated capital adequacy framework, encompassing both risk-based capital ratios and leverage ratios.

Risk-Based Capital Ratios

The U.S. Basel III rules set forth the composition of regulatory capital (including the application of regulatory capital adjustments and deductions), as well as two comprehensive methodologies (a Standardized Approach and Advanced Approaches) for measuring total risk-weighted assets.

Total risk-weighted assets under the Standardized Approach include credit and market risk-weighted assets, which are generally prescribed supervisory risk weights. Total risk-weighted assets under the Advanced Approaches, which are primarily model based, include credit, market and operational risk-weighted assets. As a result, credit risk-weighted assets calculated under the Advanced Approaches are more risk sensitive than those calculated under the Standardized Approach. Market risk-weighted assets are currently calculated on a generally consistent basis under both the Standardized and Advanced Approaches. The Standardized Approach does not include operational risk-weighted assets.

Under the U.S. Basel III rules, Citigroup is required to maintain several regulatory capital buffers above the stated minimum capital requirements to avoid certain limitations on capital distributions and discretionary bonus payments to executive officers. Accordingly, for the fourth quarter of 2022, Citigroup's required regulatory CET1 Capital ratio was 11.5% under the Standardized Approach (incorporating its Stress Capital Buffer of 4.0% and GSIB (global systemically important bank) surcharge of 3.0%) and 10.0% under the Advanced Approaches (inclusive of the fixed 2.5% Capital Conservation Buffer and GSIB surcharge of 3.0%).

In addition, commencing January 1, 2023, Citi's GSIB surcharge increased from 3.0% to 3.5%, which is applicable to both the Standardized and Advanced Approaches, resulting in a required CET1 Capital ratio of 12.0% under the Standardized Approach and 10.5% under the Advanced Approaches, both as of such date (for additional information, see "*GSIB Surcharge*" below).

Similarly, Citigroup's primary subsidiary, Citibank, N.A. (Citibank), is required to maintain minimum regulatory capital ratios plus applicable regulatory buffers, as well as hold sufficient capital to be considered "well capitalized" under the Prompt Corrective Action framework. In effect, Citibank's required CET1 Capital ratio was 7.0% under both the Standardized and Advanced Approaches, which is the sum of the minimum 4.5% CET1 requirement and a fixed 2.5% Capital Conservation Buffer. For additional information, see "Regulatory Capital Buffers" and "Prompt Corrective Action Framework" below.

Further, the U.S. Basel III rules implement the "capital floor provision" of the Dodd-Frank Act (the so-called "Collins Amendment"), which requires banking organizations to calculate "generally applicable" capital requirements. As a result, Citi must calculate each of the three risk-based capital ratios (CET1 Capital, Tier 1 Capital and Total Capital) under both the Standardized Approach and the Advanced Approaches and comply with the more binding of each of the resulting risk-based capital ratios.

Tier 1 Leverage Ratio

Under the U.S. Basel III rules, Citigroup is also required to maintain a minimum Tier 1 Leverage ratio of 4.0%. Similarly, Citibank is required to maintain a minimum Tier 1 Leverage ratio of 5.0% to be considered "well capitalized" under the Prompt Corrective Action framework. The Tier 1 Leverage ratio, a non-risk-based measure of capital adequacy, is defined as Tier 1 Capital as a percentage of quarterly adjusted average total assets less amounts deducted from Tier 1 Capital.

Supplementary Leverage Ratio

Citi is also required to calculate a Supplementary Leverage ratio (SLR), which differs from the Tier 1 Leverage ratio by including certain off-balance sheet exposures within the denominator of the ratio (Total Leverage Exposure). The SLR represents end-of-period Tier 1 Capital to Total Leverage Exposure. Total Leverage Exposure is defined as the sum of (i) the daily average of on-balance sheet assets for the quarter and (ii) the average of certain off-balance sheet exposures calculated as of the last day of each month in the quarter, less applicable Tier 1 Capital deductions. Advanced Approaches banking organizations are required to maintain a stated minimum SLR of 3.0%.

Further, U.S. GSIBs, including Citigroup, are subject to a 2.0% leverage buffer in addition to the 3.0% stated minimum SLR requirement, resulting in a 5.0% SLR. If a U.S. GSIB fails to exceed this requirement, it will be subject to increasingly stringent restrictions (depending upon the extent of the shortfall) on capital distributions and discretionary executive bonus payments.

Similarly, Citibank is required to maintain a minimum SLR of 6.0% to be considered "well capitalized" under the Prompt Corrective Action framework.

Regulatory Capital Treatment—Modified Transition of the Current Expected Credit Losses Methodology

In 2020, the U.S. banking agencies issued a final rule that modified the regulatory capital transition provision related to the current expected credit losses (CECL) methodology. The rule does not have any impact on U.S. GAAP accounting.

The rule permitted banks to delay for two years the "Day One" adverse regulatory capital effects resulting from adoption of the CECL methodology on January 1, 2020 until January 1, 2022, followed by a three-year transition to phase out the regulatory capital benefit provided by the delay.

In addition, for the ongoing impact of CECL, the agencies utilized a 25% scaling factor as an approximation of the increased reserve build under CECL compared to the previous incurred loss model and, therefore, allowed banks to add back to CET1 Capital an amount equal to 25% of the change in CECL-based allowances in each quarter between January 1, 2020 and December 31, 2021. Beginning January 1, 2022, the cumulative 25% change in CECL-based allowances between January 1, 2020 and December 31, 2021 started to be phased in to regulatory capital (i) at 25% per year on January 1 of each year over the three-year transition period and (ii) along with the delayed Day One impact.

Citigroup and Citibank elected the modified CECL transition provision provided by the rule. Accordingly, the Day One regulatory capital effects resulting from adoption of the CECL methodology, as well as the ongoing adjustments for 25% of the change in CECL-based allowances in each quarter between January 1, 2020 and December 31, 2021, started to be phased in on January 1, 2022 and will be fully reflected in Citi's regulatory capital as of January 1, 2025.

As of December 31, 2022, Citigroup's reported CET1 Capital ratio of 13.0% benefited from the deferrals of the CECL transition provision by 24 basis points. For additional information on Citigroup's and Citibank's regulatory capital ratios excluding the impact of the CECL transition provision, see "Capital Resources (Full Adoption of CECL)" below.

Regulatory Capital Buffers

Citigroup and Citibank are required to maintain several regulatory capital buffers above the stated minimum capital requirements. These capital buffers would be available to absorb losses in advance of any potential impairment of regulatory capital below the stated minimum regulatory capital ratio requirements.

Banking organizations that fall below their regulatory capital buffers are subject to limitations on capital distributions and discretionary bonus payments to executive officers based on a percentage of "Eligible Retained Income" (ERI), with increasing restrictions based upon the severity of the breach. ERI is equal to the greater of (i) the bank's net income for the four calendar quarters preceding the current calendar quarter, net of any distributions and tax effects not already reflected in net income, and (ii) the average of the bank's net income for the four calendar quarters preceding the current calendar quarter.

As of December 31, 2022, Citi's regulatory capital ratios exceeded the regulatory capital requirements. Accordingly, Citi is not subject to payout limitations as a result of the U.S. Basel III requirements.

Stress Capital Buffer

Citigroup is subject to the FRB's Stress Capital Buffer (SCB) rule, which integrates the annual stress testing requirements with ongoing regulatory capital requirements. The SCB equals the peak-to-trough CET1 Capital ratio decline under the Supervisory Severely Adverse scenario over a nine-quarter period used in the Comprehensive Capital Analysis and Review (CCAR) and Dodd-Frank Act Stress Testing (DFAST), plus four quarters of planned common stock dividends, subject to a floor of 2.5%. SCB-based capital requirements are reviewed and updated annually by the FRB as part of the CCAR process. For additional information regarding CCAR and DFAST, see "Stress Testing Component of Capital Planning" below. The fixed 2.5% Capital Conservation Buffer will continue to apply under the Advanced Approaches (for additional information, see below).

In August 2022, the FRB finalized and announced Citi's SCB requirement of 4.0% for the four-quarter window starting from October 1, 2022 to September 30, 2023.

Accordingly, as of October 1, 2022, Citi is required to maintain an 11.5% required regulatory CET1 Capital ratio under the Standardized Approach, incorporating this SCB and its GSIB surcharge of 3.0%. Previously, from October 1, 2021 through September 30, 2022, Citi had been subject to a 3.0% SCB, and a 10.5% required regulatory CET1 Capital ratio

under the Standardized Approach. Citi's required regulatory CET1 Capital ratio under the Advanced Approaches (using the fixed 2.5% Capital Conservation Buffer) remains unchanged at 10.0%. The SCB applies to Citigroup only; the regulatory capital framework applicable to Citibank, including the Capital Conservation Buffer, is unaffected by Citigroup's SCB.

Capital Conservation Buffer and Countercyclical Capital Buffer

Citigroup is subject to a fixed 2.5% Capital Conservation Buffer under the Advanced Approaches. Citibank is subject to the fixed 2.5% Capital Conservation Buffer under both the Advanced Approaches and the Standardized Approach.

In addition, Advanced Approaches banking organizations, such as Citigroup and Citibank, are subject to a discretionary Countercyclical Capital Buffer. The Countercyclical Capital Buffer is currently set at 0% by the U.S. banking agencies.

GSIB Surcharge

The FRB imposes a risk-based capital surcharge upon U.S. bank holding companies that are identified as GSIBs, including Citi. The GSIB surcharge augments the SCB, Capital Conservation Buffer and, if invoked, any Countercyclical Capital Buffer.

A U.S. bank holding company that is designated a GSIB is required, on an annual basis, to calculate a surcharge using two methods and is subject to the higher of the resulting two surcharges. The first method ("method 1") is based on the Basel Committee's GSIB methodology. Under the second method ("method 2"), the substitutability category under the Basel Committee's GSIB methodology is replaced with a quantitative measure intended to assess a GSIB's reliance on short-term wholesale funding. In addition, method 1 incorporates relative measures of systemic importance across certain global banking organizations and a year-end spot foreign exchange rate, whereas method 2 uses fixed measures of systemic importance and application of an average foreign exchange rate over a three-year period. The GSIB surcharges calculated under both method 1 and method 2 are based on measures of systemic importance from the year immediately preceding that in which the GSIB surcharge calculations are being performed (e.g., the method 1 and method 2 GSIB surcharges calculated during 2022 will be based on 2021 systemic indicator data). Generally, Citi's surcharge determined under method 2 will result in a higher surcharge than its surcharge determined under method 1.

Should a GSIB's systemic importance change year-over-year, such that it becomes subject to a higher GSIB surcharge, the higher surcharge would become effective on January 1 of the year that is one full calendar year after the increased GSIB surcharge was calculated (e.g., a higher surcharge calculated in 2024 using data as of December 31, 2023 would not become effective until January 1, 2026). However, if a GSIB's systemic importance changes such that the GSIB would be subject to a lower surcharge, the GSIB would be subject to the lower surcharge on January 1 of the year immediately following the calendar year in which the decreased GSIB surcharge was calculated (e.g., a lower surcharge calculated in 2024 using data as of December 31, 2023 would become effective January 1, 2025).

The following table presents Citi's effective GSIB surcharge as determined under method 1 and method 2 during 2022 and 2021:

	2022	2021
Method 1	**2.0 %**	2.0 %
Method 2	**3.0**	3.0

Citi's GSIB surcharge effective during both 2022 and 2021 was 3.0%, as derived under the higher method 2 result. Citi's GSIB surcharge effective for 2023 has increased from 3.0% to 3.5%, as derived under the higher method 2 result.

Citi expects that its method 2 GSIB surcharge will continue to remain higher than its method 1 GSIB surcharge. Accordingly, based on Citi's method 2 result as of December 31, 2021 and its estimated method 2 result as of December 31, 2022, Citi's GSIB surcharge is expected to remain at 3.5% effective January 1, 2024. Citi's GSIB surcharge effective for 2025 will likely be based on the lower of its method 2 scores for year-end 2022 and 2023 and, therefore, is not expected to exceed 3.5%.

Prompt Corrective Action Framework

In general, the Prompt Corrective Action (PCA) regulations direct the U.S. banking agencies to enforce increasingly strict limitations on the activities of insured depository institutions that fail to meet certain regulatory capital thresholds. The PCA framework contains five categories of capital adequacy as measured by risk-based capital and leverage ratios: (i) "well capitalized," (ii) "adequately capitalized," (iii) "undercapitalized," (iv) "significantly undercapitalized" and (v) "critically undercapitalized."

Accordingly, an insured depository institution, such as Citibank, must maintain minimum CET1 Capital, Tier 1 Capital, Total Capital and Tier 1 Leverage ratios of 6.5%, 8.0%, 10.0% and 5.0%, respectively, to be considered "well capitalized." In addition, insured depository institution subsidiaries of U.S. GSIBs, including Citibank, must maintain a minimum Supplementary Leverage ratio of 6.0% to be considered "well capitalized." Citibank was "well capitalized" as of December 31, 2022.

Furthermore, to be "well capitalized" under current federal bank regulatory agency definitions, a bank holding company must have a Tier 1 Capital ratio of at least 6.0%, a Total Capital ratio of at least 10.0% and not be subject to a FRB directive to maintain higher capital levels.

Stress Testing Component of Capital Planning

Citi is subject to an annual assessment by the FRB as to whether Citigroup has effective capital planning processes as well as sufficient regulatory capital to absorb losses during stressful economic and financial conditions, while also meeting obligations to creditors and counterparties and continuing to serve as a credit intermediary. This annual assessment includes two related programs: the Comprehensive Capital Analysis and Review (CCAR) and Dodd-Frank Act Stress Testing (DFAST).

For the largest and most complex firms, such as Citi, CCAR includes a qualitative evaluation of a firm's abilities to determine its capital needs on a forward-looking basis. In conducting the qualitative assessment, the FRB evaluates firms' capital planning practices, focusing on six areas of capital planning: governance, risk management, internal controls, capital policies, incorporating stressful conditions and events, and estimating impact on capital positions. As part of the CCAR process, the FRB evaluates Citi's capital adequacy, capital adequacy process and its planned capital distributions, such as dividend payments and common share repurchases. The FRB assesses whether Citi has sufficient capital to continue operations throughout times of economic and financial market stress and whether Citi has robust, forward-looking capital planning processes that account for its unique risks.

All CCAR firms, including Citi, are subject to a rigorous evaluation of their capital planning process. Firms with weak practices may be subject to a deficient supervisory rating, and potentially an enforcement action, for failing to meet supervisory expectations. For additional information regarding CCAR, see "Risk Factors—Strategic Risks" below.

DFAST is a forward-looking quantitative evaluation of the impact of stressful economic and financial market conditions on Citi's regulatory capital. This program serves to inform the FRB and the general public as to how Citi's regulatory capital ratios might change using a hypothetical set of adverse economic conditions as designed by the FRB. In addition to the annual supervisory stress test conducted by the FRB, Citi is required to conduct annual company-run stress tests under the same adverse economic conditions designed by the FRB.

Both CCAR and DFAST include an estimate of projected revenues, losses, reserves, pro forma regulatory capital ratios and any other additional capital measures deemed relevant by Citi. Projections are required over a nine-quarter planning horizon under two supervisory scenarios (baseline and severely adverse conditions). All risk-based capital ratios reflect application of the Standardized Approach framework under the U.S. Basel III rules.

In addition, Citibank is required to conduct the annual Dodd-Frank Act Stress Test. The annual stress test consists of a forward-looking quantitative evaluation of the impact of stressful economic and financial market conditions under several scenarios on Citibank's regulatory capital. This program serves to inform the Office of the Comptroller of the Currency as to how Citibank's regulatory capital ratios might change during a hypothetical set of adverse economic conditions and to ultimately evaluate the reliability of Citibank's capital planning process.

Citigroup and Citibank are required to disclose the results of their company-run stress tests.

Citigroup's Capital Resources

The following table presents Citi's required risk-based capital ratios as of December 31, 2022, September 30, 2022 and December 31, 2021:

	Advanced Approaches			Standardized Approach		
	December 31, 2022	September 30, 2022	December 31, 2021	**December 31, 2022**	September 30, 2022	December 31, 2021
CET1 Capital ratio[1]	**10.0 %**	10.0 %	10.0 %	**11.5 %**	10.5 %	10.5 %
Tier 1 Capital ratio[1]	**11.5**	11.5	11.5	**13.0**	12.0	12.0
Total Capital ratio[1]	**13.5**	13.5	13.5	**15.0**	14.0	14.0

(1) Beginning October 1, 2022, Citi's required risk-based capital ratios included the 4.0% SCB and 3.0% GSIB surcharge under the Standardized Approach, and the 2.5% Capital Conservation Buffer and 3.0% GSIB surcharge under the Advanced Approaches (all of which must be composed of CET1 Capital). For prior periods presented, Citi's required risk-based capital ratios included the 3.0% SCB and 3.0% GSIB surcharge under the Standardized Approach, and the 2.5% Capital Conservation Buffer and 3.0% GSIB surcharge under the Advanced Approaches. Commencing January 1, 2023, Citi's GSIB surcharge increased from 3.0% to 3.5%, which is applicable to both the Standardized Approach and Advanced Approaches. See "Regulatory Capital Buffers" above for more information.

The following tables present Citi's capital components and ratios as of December 31, 2022, September 30, 2022 and December 31, 2021:

	Advanced Approaches			Standardized Approach		
In millions of dollars, except ratios	**December 31, 2022**	September 30, 2022	December 31, 2021	**December 31, 2022**	September 30, 2022	December 31, 2021
CET1 Capital[1]	**$ 148,930**	$ 144,567	$ 149,305	**$ 148,930**	$ 144,567	$ 149,305
Tier 1 Capital[1]	**169,145**	164,830	169,568	**169,145**	164,830	169,568
Total Capital (Tier 1 Capital + Tier 2 Capital)[1]	**188,839**	185,046	194,006	**197,543**	193,871	203,838
Total Risk-Weighted Assets	**1,221,538**	1,226,578	1,209,374	**1,142,985**	1,176,749	1,219,175
Credit Risk[1]	**$ 851,875**	$ 849,769	$ 840,483	**$ 1,069,992**	$ 1,096,384	$ 1,135,906
Market Risk	**71,889**	78,748	78,634	**72,993**	80,365	83,269
Operational Risk	**297,774**	298,061	290,257	**—**	—	—
CET1 Capital ratio[2]	**12.19 %**	11.79 %	12.35 %	**13.03 %**	12.29 %	12.25 %
Tier 1 Capital ratio[2]	**13.85**	13.44	14.02	**14.80**	14.01	13.91
Total Capital ratio[2]	**15.46**	15.09	16.04	**17.28**	16.48	16.72

In millions of dollars, except ratios	Required Capital Ratios	**December 31, 2022**	September 30, 2022	December 31, 2021
Quarterly Adjusted Average Total Assets[1][3]		**$ 2,395,863**	$ 2,364,564	$ 2,351,434
Total Leverage Exposure[1][4]		**2,906,773**	2,888,535	2,957,764
Tier 1 Leverage ratio	**4.0%**	**7.06 %**	6.97 %	7.21 %
Supplementary Leverage ratio	**5.0**	**5.82**	5.71	5.73

(1) Citi's regulatory capital ratios and components reflect certain deferrals based on the modified regulatory capital transition provision related to the CECL standard. For additional information, see "Capital Resources—Regulatory Capital Treatment—Modified Transition of the Current Expected Credit Losses Methodology" above.

(2) Citi's binding CET1 Capital and Tier 1 Capital ratios were derived under the Basel III Standardized Approach, whereas Citi's binding Total Capital ratio was derived under the Basel III Advanced Approaches framework for all periods presented.

(3) Tier 1 Leverage ratio denominator. Represents quarterly average total assets less amounts deducted from Tier 1 Capital.

(4) Supplementary Leverage ratio denominator.

Common Equity Tier 1 Capital Ratio

Citi's Common Equity Tier 1 (CET1) Capital ratio under the Basel III Standardized Approach was 13.0% as of December 31, 2022, relative to a required regulatory CET1 Capital ratio of 11.5% as of such date under the Standardized Approach. This compares to a CET1 Capital ratio of 12.3% as of September 30, 2022 and 12.2% as of December 31, 2021, relative to a required regulatory CET1 Capital ratio of 10.5% as of such dates under the Standardized Approach.

Citi's CET1 Capital ratio under the Basel III Advanced Approaches was 12.2% as of December 31, 2022, compared to 11.8% as of September 30, 2022 and 12.3% as of December 31, 2021, relative to a required regulatory CET1 Capital ratio of 10.0% as of such dates under the Advanced Approaches framework.

Citi's CET1 Capital ratio increased under both the Standardized Approach and Advanced Approaches from September 30, 2022, driven primarily by net income, business actions to reduce RWA, beneficial net movements in *AOCI* and impacts from the closing of Asia consumer banking business sales, partially offset by the payment of common dividends.

Citi's CET1 Capital ratio increased under the Standardized Approach from year-end 2021, due to the net income of $14.8 billion, impacts from the closing of the Australia, Philippines and other Asia consumer banking business sales and business actions to reduce RWA, partially offset by the return of capital to common shareholders and interest rate impacts on Citigroup's investment portfolio. The increase in Citi's CET1 Capital ratio was also partially offset by the impact of adopting the Standardized Approach for Counterparty Credit Risk (SA-CCR) on January 1, 2022.

Citi's CET1 Capital ratio decreased under the Advanced Approaches from year-end 2021, due to the return of capital to common shareholders, the interest rate impacts on Citigroup's investment portfolio and the impact of adopting the SA-CCR, partially offset by the net income of $14.8 billion and the impacts from the closing of the Australia, Philippines and other Asia consumer banking business sales.

For additional information on SA-CCR, see "Standardized Approach for Counterparty Credit Risk" below.

Components of Citigroup Capital

In millions of dollars	December 31, 2022	December 31, 2021
CET1 Capital		
Citigroup common stockholders' equity[1]	$ 182,325	$ 183,108
Add: Qualifying noncontrolling interests	128	143
Regulatory capital adjustments and deductions:		
Add: CECL transition provision[2]	2,271	3,028
Less: Accumulated net unrealized gains (losses) on cash flow hedges, net of tax	(2,522)	101
Less: Cumulative unrealized net gain (loss) related to changes in fair value of financial liabilities attributable to own creditworthiness, net of tax	1,441	(896)
Less: Intangible assets:		
Goodwill, net of related DTLs[3]	19,007	20,619
Identifiable intangible assets other than MSRs, net of related DTLs	3,411	3,800
Less: Defined benefit pension plan net assets; other	1,935	2,080
Less: DTAs arising from net operating loss, foreign tax credit and general business credit carry-forwards[4]	12,197	11,270
Less: Excess over 10%/15% limitations for other DTAs, certain common stock investments, and MSRs[4][5]	325	—
Total CET1 Capital (Standardized Approach and Advanced Approaches)	$ 148,930	$ 149,305
Additional Tier 1 Capital		
Qualifying noncumulative perpetual preferred stock[1]	$ 18,864	$ 18,864
Qualifying trust preferred securities[6]	1,406	1,399
Qualifying noncontrolling interests	30	34
Regulatory capital deductions:		
Less: Other	85	34
Total Additional Tier 1 Capital (Standardized Approach and Advanced Approaches)	$ 20,215	$ 20,263
Total Tier 1 Capital (CET1 Capital + Additional Tier 1 Capital) (Standardized Approach and Advanced Approaches)	$ 169,145	$ 169,568
Tier 2 Capital		
Qualifying subordinated debt	$ 15,530	$ 20,064
Qualifying trust preferred securities[7]	—	248
Qualifying noncontrolling interests	37	42
Eligible allowance for credit losses[2][8]	13,426	14,209
Regulatory capital deduction:		
Less: Other	595	293
Total Tier 2 Capital (Standardized Approach)	$ 28,398	$ 34,270
Total Capital (Tier 1 Capital + Tier 2 Capital) (Standardized Approach)	$ 197,543	$ 203,838
Adjustment for excess of eligible credit reserves over expected credit losses[2][8]	$ (8,704)	$ (9,832)
Total Tier 2 Capital (Advanced Approaches)	$ 19,694	$ 24,438
Total Capital (Tier 1 Capital + Tier 2 Capital) (Advanced Approaches)	$ 188,839	$ 194,006

(1) Issuance costs of $131 million related to outstanding noncumulative perpetual preferred stock at December 31, 2022 and 2021 were excluded from common stockholders' equity and netted against such preferred stock in accordance with FRB regulatory reporting requirements, which differ from those under U.S. GAAP.

(2) Citi's regulatory capital ratios and components reflect certain deferrals based on the modified regulatory capital transition provision related to the CECL standard. For additional information, see "Capital Resources—Regulatory Capital Treatment—Modified Transition of the Current Expected Credit Losses Methodology" above.

(3) Includes goodwill "embedded" in the valuation of significant common stock investments in unconsolidated financial institutions.

Footnotes continue on the following page.

(4) Of Citi's $27.7 billion of net DTAs at December 31, 2022, $12.2 billion of net DTAs arising from net operating loss, foreign tax credit and general business credit tax carry-forwards, as well as $0.3 billion of DTAs arising from temporary differences that exceeded 10%/15% limitations, were excluded from Citi's CET1 Capital as of December 31, 2022. DTAs arising from net operating loss, foreign tax credit and general business credit tax carry-forwards are required to be entirely deducted from CET1 Capital under the U.S. Basel III rules. DTAs arising from temporary differences are required to be deducted from capital only if they exceed 10%/15% limitations under the U.S. Basel III rules.

(5) Assets subject to 10%/15% limitations include MSRs, DTAs arising from temporary differences and significant common stock investments in unconsolidated financial institutions. At December 31, 2022, this deduction related only to DTAs arising from temporary differences that exceeded the 10% limitation. At December 31, 2021, none of these assets were in excess of the 10%/15% limitations.

(6) Represents Citigroup Capital XIII trust preferred securities, which are permanently grandfathered as Tier 1 Capital under the U.S. Basel III rules.

(7) Represents the amount of non-grandfathered trust preferred securities that were previously eligible for inclusion in Tier 2 Capital under the U.S. Basel III rules. Commencing January 1, 2022, non-grandfathered trust preferred securities have been fully phased out of Tier 2 Capital.

(8) Under the Standardized Approach, the allowance for credit losses is eligible for inclusion in Tier 2 Capital up to 1.25% of credit risk-weighted assets, with any excess allowance for credit losses being deducted in arriving at credit risk-weighted assets, which differs from the Advanced Approaches framework, in which eligible credit reserves that exceed expected credit losses are eligible for inclusion in Tier 2 Capital to the extent that the excess reserves do not exceed 0.6% of credit risk-weighted assets. The total amount of eligible credit reserves in excess of expected credit losses that were eligible for inclusion in Tier 2 Capital, subject to limitation, under the Advanced Approaches framework were $4.7 billion and $4.4 billion at December 31, 2022 and December 31, 2021, respectively.

Citigroup Capital Rollforward

In millions of dollars	Three months ended December 31, 2022	Twelve months ended December 31, 2022
CET1 Capital, beginning of period	$ 144,567	$ 149,305
Net income	2,513	14,845
Common and preferred dividends declared	(1,241)	(5,060)
Net change in treasury stock	10	(2,727)
Net increase in common stock and additional paid-in capital	111	455
Net change in CTA net of hedges, net of tax	1,571	(2,472)
Net change in unrealized gains (losses) on debt securities AFS, net of tax	974	(5,384)
Net change in defined benefit plans liability adjustment, net of tax	(22)	97
Net change in adjustment related to change in fair value of financial liabilities attributable to own creditworthiness, net of tax	168	(307)
Net change in excluded component of fair value hedges	(32)	55
Net change in goodwill, net of related DTLs	(211)	1,612
Net decrease in identifiable intangible assets other than MSRs, net of related DTLs	81	389
Net change in defined benefit pension plan net assets	(7)	61
Net increase in DTAs arising from net operating loss, foreign tax credit and general business credit carry-forwards	(507)	(927)
Net change in excess over 10%/15% limitations for other DTAs, certain common stock investments and MSRs	936	(325)
Net decrease in CECL 25% provision deferral	—	(757)
Other	19	70
Net change in CET1 Capital	$ 4,363	$ (375)
CET1 Capital, end of period (Standardized Approach and Advanced Approaches)	$ 148,930	$ 148,930
Additional Tier 1 Capital, beginning of period	$ 20,263	$ 20,263
Net increase in qualifying trust preferred securities	2	7
Other	(50)	(55)
Net decrease in Additional Tier 1 Capital	$ (48)	$ (48)
Tier 1 Capital, end of period (Standardized Approach and Advanced Approaches)	$ 169,145	$ 169,145
Tier 2 Capital, beginning of period (Standardized Approach)	$ 29,041	$ 34,270
Net decrease in qualifying subordinated debt	(149)	(4,534)
Net decrease in eligible allowance for credit losses	(326)	(783)
Other	(168)	(555)
Net decrease in Tier 2 Capital (Standardized Approach)	$ (643)	$ (5,872)
Tier 2 Capital, end of period (Standardized Approach)	$ 28,398	$ 28,398
Total Capital, end of period (Standardized Approach)	$ 197,543	$ 197,543
Tier 2 Capital, beginning of period (Advanced Approaches)	$ 20,216	$ 24,438
Net decrease in qualifying subordinated debt	(149)	(4,534)
Net increase in excess of eligible credit reserves over expected credit losses	(205)	345
Other	(168)	(555)
Net decrease in Tier 2 Capital (Advanced Approaches)	$ (522)	$ (4,744)
Tier 2 Capital, end of period (Advanced Approaches)	$ 19,694	$ 19,694
Total Capital, end of period (Advanced Approaches)	$ 188,839	$ 188,839

Citigroup Risk-Weighted Assets Rollforward (Basel III Standardized Approach)

In millions of dollars	Three months ended December 31, 2022	Twelve months ended December 31, 2022
Total Risk-Weighted Assets, beginning of period	$ 1,176,749	$ 1,219,175
Changes in Credit Risk-Weighted Assets		
General credit risk exposures[1]	(4,243)	(26,061)
Repo-style transactions[2]	(225)	(15,302)
Securitization exposures[3]	2,928	4,886
Equity exposures[4]	3,751	453
Over-the-counter (OTC) derivatives[5]	(27,320)	(4,619)
Other exposures[6]	(1,911)	(10,718)
Off-balance sheet exposures[7]	628	(14,553)
Net decrease in Credit Risk-Weighted Assets	$ (26,392)	$ (65,914)
Changes in Market Risk-Weighted Assets		
Risk levels	$ (8,974)	$ (15,961)
Model and methodology updates	1,602	5,685
Net decrease in Market Risk-Weighted Assets[8]	$ (7,372)	$ (10,276)
Total Risk-Weighted Assets, end of period	$ 1,142,985	$ 1,142,985

(1) General credit risk exposures include cash and balances due from depository institutions, securities, and loans and leases. General credit risk exposures decreased during the three and 12 months ended December 31, 2022 primarily due to Asia consumer divestitures and a decrease in corporate lending, partially offset by an increase in card activities.

(2) Repo-style transactions include repurchase and reverse repurchase transactions, as well as securities borrowing and securities lending transactions. Repo-style transactions decreased during the 12 months ended December 31, 2022 primarily due to reduced exposure in repurchase agreements and securities lending, as well as a decrease in margin loans.

(3) Securitization exposures increased during the three and 12 months ended December 31, 2022 primarily due to new exposures.

(4) Equity exposures increased during the three months ended December 31, 2022 primarily due to increases in market value of various investments.

(5) OTC derivatives decreased during the three months ended December 31, 2022 primarily due to decreases across FX, commodities and equities. OTC derivatives decreased during the 12 months ended December 31, 2022 primarily due to decreases in rates, FX, commodities and equities, partially offset by the impact from the adoption of SA-CCR. For additional information on SA-CCR, see "Standardized Approach for Counterparty Credit Risk" below.

(6) Other exposures include cleared transactions, unsettled transactions and other assets. Other exposures decreased during the 12 months ended December 31, 2022 primarily due to decreases in centrally cleared derivatives and default fund contributions, partially offset by an increase in fixed assets.

(7) Off-balance sheet exposures decreased during the 12 months ended December 31, 2022 primarily due to a decrease in loan commitments.

(8) Market risk-weighted assets decreased during the three and 12 months ended December 31, 2022 primarily due to exposure changes, partially offset by changes in model inputs regarding volatility and the correlation between market risk factors.

Citigroup Risk-Weighted Assets Rollforward (Basel III Advanced Approaches)

In millions of dollars	Three months ended December 31, 2022	Twelve months ended December 31, 2022
Total Risk-Weighted Assets, beginning of period	$ 1,226,578	$ 1,209,374
Changes in Credit Risk-Weighted Assets		
Retail exposures[1]	4,610	12,633
Wholesale exposures[2]	2,094	(14,843)
Repo-style transactions[3]	390	(10,694)
Securitization exposures[4]	2,916	5,057
Equity exposures[5]	3,795	948
Over-the-counter (OTC) derivatives[6]	(11,929)	(2,667)
Derivatives CVA[7]	(2,067)	19,667
Other exposures[8]	2,026	1,725
Supervisory 6% multiplier	271	(434)
Net increase in Credit Risk-Weighted Assets	$ 2,106	$ 11,392
Changes in Market Risk-Weighted Assets		
Risk levels	$ (8,461)	$ (12,430)
Model and methodology updates	1,602	5,685
Net decrease in Market Risk-Weighted Assets[9]	$ (6,859)	$ (6,745)
Net change in Operational Risk-Weighted Assets[10]	$ (287)	$ 7,517
Total Risk-Weighted Assets, end of period	$ 1,221,538	$ 1,221,538

(1) Retail exposures increased during the three months ended December 31, 2022 primarily due to an increase in card activities, partially offset by a decrease from divestitures. Retail exposures increased during the 12 months ended December 31, 2022 primarily due to increases in card activities, consumer loans and model recalibrations, partially offset by a decrease from divestitures.

(2) Wholesale exposures decreased during the 12 months ended December 31, 2022 primarily due to decreases in wholesale loans and available-for-sale securities.

(3) Repo-style transactions include repurchase and reverse repurchase transactions as well as securities borrowing and securities lending transactions. Repo-style transactions decreased during the 12 months ended December 31, 2022 primarily due to reduced exposure in repurchase agreements and securities lending, as well as a decrease in margin loans.

(4) Securitization exposures increased during the three and 12 months ended December 31, 2022 primarily driven by new exposures.

(5) Equity exposures increased during the three months ended December 31, 2022 primarily due to increases in market value of various investments.

(6) OTC derivatives decreased during the three months ended December 31, 2022 primarily due to exposure decreases across FX and commodities. OTC derivatives decreased during the 12 months ended December 31, 2022 primarily due to exposure decreases across FX and commodities, partially offset by the impact from the adoption of SA-CCR. For additional information on SA-CCR, see "Standardized Approach for Counterparty Credit Risk" below.

(7) Derivatives CVA increased during the 12 months ended December 31, 2022 primarily due to the adoption of SA-CCR. For additional information on SA-CCR, see "Standardized Approach for Counterparty Credit Risk" below.

(8) Other exposures include cleared transactions, unsettled transactions, assets other than those reportable in specific exposure categories and non-material portfolios. Other exposures increased during the three and 12 months ended December 31, 2022 primarily due to an increase in fixed assets.

(9) Market risk-weighted assets decreased during the three and 12 months ended December 31, 2022 primarily due to exposure changes, partially offset by changes in model inputs regarding volatility and the correlation between market risk factors.

(10) Operational risk-weighted assets increased during the 12 months ended December 31, 2022 primarily due to new model severity updates.

Supplementary Leverage Ratio

The following table presents Citi's Supplementary Leverage ratio and related components as of December 31, 2022, September 30, 2022 and December 31, 2021:

In millions of dollars, except ratios	December 31, 2022	September 30, 2022	December 31, 2021
Tier 1 Capital	**$ 169,145**	$ 164,830	$ 169,568
Total Leverage Exposure			
On-balance sheet assets[1][2]	**$ 2,432,823**	$ 2,401,767	$ 2,389,237
Certain off-balance sheet exposures[3]			
Potential future exposure on derivative contracts	**133,071**	153,842	222,241
Effective notional of sold credit derivatives, net[4]	**34,117**	32,768	23,788
Counterparty credit risk for repo-style transactions[5]	**17,169**	16,997	25,775
Other off-balance sheet exposures	**326,553**	320,364	334,526
Total of certain off-balance sheet exposures	**$ 510,910**	$ 523,971	$ 606,330
Less: Tier 1 Capital deductions	**36,960**	37,203	37,803
Total Leverage Exposure	**$ 2,906,773**	$ 2,888,535	$ 2,957,764
Supplementary Leverage ratio	**5.82 %**	5.71 %	5.73 %

(1) Represents the daily average of on-balance sheet assets for the quarter.
(2) Citi's regulatory capital ratios and components reflect certain deferrals based on the modified regulatory capital transition provision related to the CECL standard. For additional information, see "Capital Resources—Regulatory Capital Treatment—Modified Transition of the Current Expected Credit Losses Methodology" above.
(3) Represents the average of certain off-balance sheet exposures calculated as of the last day of each month in the quarter.
(4) Under the U.S. Basel III rules, banking organizations are required to include in Total Leverage Exposure the effective notional amount of sold credit derivatives, with netting of exposures permitted if certain conditions are met.
(5) Repo-style transactions include repurchase and reverse repurchase transactions as well as securities borrowing or securities lending transactions.

As presented in the table above, Citigroup's Supplementary Leverage ratio was 5.8% at December 31, 2022, compared to 5.7% at September 30, 2022 and December 31, 2021. The quarter-over-quarter increase was primarily driven by an increase in Tier 1 Capital due to net income in the fourth quarter of 2022 and beneficial net movements in *AOCI*, partially offset by an increase in Total Leverage Exposure. The year-over-year increase was primarily driven by a decrease in Total Leverage Exposure.

Capital Resources of Citigroup's Subsidiary U.S. Depository Institutions

Citigroup's subsidiary U.S. depository institutions are also subject to regulatory capital standards issued by their respective primary bank regulatory agencies, which are similar to the standards of the FRB.

The following tables present the capital components and ratios for Citibank, Citi's primary subsidiary U.S. depository institution, as of December 31, 2022, September 30, 2022 and December 31, 2021:

		Advanced Approaches			Standardized Approach		
In millions of dollars, except ratios	Required Capital Ratios[1]	**December 31, 2022**	September 30, 2022	December 31, 2021	**December 31, 2022**	September 30, 2022	December 31, 2021
CET1 Capital[2]		**$ 149,593**	$ 147,938	$ 148,548	**$ 149,593**	$ 147,938	$ 148,548
Tier 1 Capital[2]		**151,720**	150,062	150,679	**151,720**	150,062	150,679
Total Capital (Tier 1 Capital + Tier 2 Capital)[2][3]		**165,131**	165,171	166,921	**172,647**	172,916	175,427
Total Risk-Weighted Assets		**1,003,747**	1,046,884	1,017,774	**982,914**	1,024,923	1,066,015
Credit Risk[2]		**$ 728,082**	$ 762,660	$ 737,802	**$ 948,150**	$ 983,949	$ 1,016,293
Market Risk		**34,403**	40,676	48,089	**34,764**	40,974	49,722
Operational Risk		**241,262**	243,548	231,883	**—**	—	—
CET1 Capital ratio[4][5]	**7.0 %**	**14.90 %**	14.13 %	14.60 %	**15.22 %**	14.43 %	13.93 %
Tier 1 Capital ratio[4][5]	**8.5**	**15.12**	14.33	14.80	**15.44**	14.64	14.13
Total Capital ratio[4][5]	**10.5**	**16.45**	15.78	16.40	**17.56**	16.87	16.46

In millions of dollars, except ratios	Required Capital Ratios	**December 31, 2022**	September 30, 2022	December 31, 2021
Quarterly Adjusted Average Total Assets[2][6]		**$ 1,738,744**	$ 1,694,381	$ 1,716,596
Total Leverage Exposure[2][7]		**2,189,541**	2,147,923	2,236,839
Tier 1 Leverage ratio[5]	**5.0 %**	**8.73 %**	8.86 %	8.78 %
Supplementary Leverage ratio[5]	**6.0**	**6.93**	6.99	6.74

(1) Citibank's required risk-based capital ratios are inclusive of the 2.5% Capital Conservation Buffer (all of which must be composed of CET1 Capital).

(2) Citibank's regulatory capital ratios and components reflect certain deferrals based on the modified regulatory capital transition provision related to the CECL standard. For additional information, see "Capital Resources—Regulatory Capital Treatment—Modified Transition of the Current Expected Credit Losses Methodology" above.

(3) Under the Advanced Approaches framework, eligible credit reserves that exceed expected credit losses are eligible for inclusion in Tier 2 Capital to the extent that the excess reserves do not exceed 0.6% of credit risk-weighted assets, which differs from the Standardized Approach in which the ACL is eligible for inclusion in Tier 2 Capital up to 1.25% of credit risk-weighted assets, with any excess ACL being deducted in arriving at credit risk-weighted assets.

(4) Citibank's binding CET1 Capital and Tier 1 Capital ratios were derived under the Basel III Advanced Approaches framework as of December 31, 2022 and September 30, 2022, and under the Basel III Standardized Approach as of December 31, 2021, whereas Citibank's binding Total Capital ratio was derived under the Basel III Advanced Approaches framework for all periods presented.

(5) Citibank must maintain required CET1 Capital, Tier 1 Capital, Total Capital and Tier 1 Leverage ratios of 6.5%, 8.0%, 10.0% and 5.0%, respectively, to be considered "well capitalized" under the revised Prompt Corrective Action (PCA) regulations applicable to insured depository institutions as established by the U.S. Basel III rules. Citibank must also maintain a required Supplementary Leverage ratio of 6.0% to be considered "well capitalized."

(6) Tier 1 Leverage ratio denominator. Represents quarterly average total assets less amounts deducted from Tier 1 Capital.

(7) Supplementary Leverage ratio denominator.

As indicated in the table above, Citibank's capital ratios at December 31, 2022 were in excess of the regulatory capital requirements under the U.S. Basel III rules. In addition, Citibank was "well capitalized" as of December 31, 2022.

As presented in the table above, Citibank's Supplementary Leverage ratio was 6.9% at December 31, 2022, compared to 7.0% at September 30, 2022 and 6.7% at December 31, 2021. The quarter-over-quarter decrease was primarily driven by an increase in Total Leverage Exposure, partially offset by an increase in Tier 1 Capital due to net income in the fourth quarter of 2022 and beneficial net movements in *AOCI*. The year-over-year increase was primarily driven by a decrease in Total Leverage Exposure.

Impact of Changes on Citigroup and Citibank Capital Ratios

The following tables present the estimated sensitivity of Citigroup's and Citibank's capital ratios to changes of $100 million in CET1 Capital, Tier 1 Capital and Total Capital (numerator), and changes of $1 billion in Advanced Approaches and Standardized Approach risk-weighted assets and quarterly adjusted average total assets, as well as Total Leverage Exposure (denominator), as of December 31, 2022. This information is provided for the purpose of analyzing the impact that a change in Citigroup's or Citibank's financial position or results of operations could have on these ratios. These sensitivities only consider a single change to either a component of capital, risk-weighted assets, quarterly adjusted average total assets or Total Leverage Exposure. Accordingly, an event that affects more than one factor may have a larger basis point impact than is reflected in these tables.

	Common Equity Tier 1 Capital ratio		Tier 1 Capital ratio		Total Capital ratio	
In basis points	Impact of $100 million change in Common Equity Tier 1 Capital	Impact of $1 billion change in risk-weighted assets	Impact of $100 million change in Tier 1 Capital	Impact of $1 billion change in risk-weighted assets	Impact of $100 million change in Total Capital	Impact of $1 billion change in risk-weighted assets
Citigroup						
Advanced Approaches	0.8	1.0	0.8	1.1	0.8	1.3
Standardized Approach	0.9	1.1	0.9	1.3	0.9	1.5
Citibank						
Advanced Approaches	1.0	1.5	1.0	1.5	1.0	1.6
Standardized Approach	1.0	1.5	1.0	1.6	1.0	1.8

	Tier 1 Leverage ratio		Supplementary Leverage ratio	
In basis points	Impact of $100 million change in Tier 1 Capital	Impact of $1 billion change in quarterly adjusted average total assets	Impact of $100 million change in Tier 1 Capital	Impact of $1 billion change in Total Leverage Exposure
Citigroup	0.4	0.3	0.3	0.2
Citibank	0.6	0.5	0.5	0.3

Citigroup Broker-Dealer Subsidiaries

At December 31, 2022, Citigroup Global Markets Inc., a U.S. broker-dealer registered with the SEC that is an indirect wholly owned subsidiary of Citigroup, had net capital, computed in accordance with the SEC's net capital rule, of $13 billion, which exceeded the minimum requirement by $8 billion.

Moreover, Citigroup Global Markets Limited, a broker-dealer registered with the United Kingdom's Prudential Regulation Authority (PRA) that is also an indirect wholly owned subsidiary of Citigroup, had total regulatory capital of $27 billion at December 31, 2022, which exceeded the PRA's minimum regulatory capital requirements.

In addition, certain of Citi's other broker-dealer subsidiaries are subject to regulation in the countries in which they do business, including requirements to maintain specified levels of net capital or its equivalent. Citigroup's other principal broker-dealer subsidiaries were in compliance with their regulatory capital requirements at December 31, 2022.

Total Loss-Absorbing Capacity (TLAC)

U.S. GSIBs, including Citi, are required to maintain minimum levels of TLAC and eligible long-term debt (LTD), each set by reference to the GSIB's consolidated risk-weighted assets (RWA) and total leverage exposure.

Minimum External TLAC Requirement

The minimum external TLAC requirement is the greater of (i) 18% of the GSIB's RWA plus the then-applicable RWA-based TLAC buffer (see below) and (ii) 7.5% of the GSIB's total leverage exposure plus a leverage-based TLAC buffer of 2% (i.e., 9.5%).

The RWA-based TLAC buffer equals the 2.5% Capital Conservation Buffer, plus any applicable Countercyclical Capital Buffer (currently 0%), plus the GSIB's capital surcharge as determined under method 1 of the GSIB surcharge rule (2.0% for Citi for 2022). Accordingly, Citi's total current minimum TLAC requirement was 22.5% of RWA for 2022.

Minimum Long-Term Debt (LTD) Requirement

The minimum LTD requirement is the greater of (i) 6% of the GSIB's RWA plus its capital surcharge as determined under method 2 of the GSIB surcharge rule (3.0% for Citi for 2022), for a total current requirement of 9% of RWA for Citi, and (ii) 4.5% of the GSIB's total leverage exposure.

The table below details Citi's eligible external TLAC and LTD amounts and ratios, and each TLAC and LTD regulatory requirement, as well as the surplus amount in dollars in excess of each requirement.

	December 31, 2022	
In billions of dollars, except ratios	External TLAC	LTD
Total eligible amount	$ 334	$ 160
% of Advanced Approaches risk-weighted assets	27.3 %	13.1 %
Regulatory requirement[1][2]	22.5	9.0
Surplus amount	$ 59	$ 50
% of Total Leverage Exposure	11.5 %	5.5 %
Regulatory requirement	9.5	4.5
Surplus amount	$ 58	$ 29

(1) External TLAC includes method 1 GSIB surcharge of 2.0%.
(2) LTD includes method 2 GSIB surcharge of 3.0%.

As of December 31, 2022, Citi exceeded each of the TLAC and LTD regulatory requirements, resulting in a $29 billion surplus above its binding TLAC requirement of LTD as a percentage of Total Leverage Exposure.

For additional information on Citi's TLAC-related requirements, see "Liquidity Risk—Total Loss-Absorbing Capacity (TLAC)" below.

Capital Resources (Full Adoption of CECL)[1]

The following tables present Citigroup's and Citibank's capital components and ratios under a hypothetical scenario where the full impact of CECL is reflected as of December 31, 2022:

	Citigroup				Citibank		
	Required Capital Ratios, Advanced Approaches	Required Capital Ratios, Standardized Approach	Advanced Approaches	Standardized Approach	Required Capital Ratios[2]	Advanced Approaches	Standardized Approach
CET1 Capital ratio	10.0 %	11.5 %	11.96 %	12.79 %	7.0 %	14.70 %	15.01 %
Tier 1 Capital ratio	11.5	13.0	13.62	14.56	8.5	14.91	15.23
Total Capital ratio	13.5	15.0	15.24	17.06	10.5	16.25	17.36

	Required Capital Ratios	Citigroup	Required Capital Ratios	Citibank
Tier 1 Leverage ratio	4.0 %	6.94 %	5.0 %	8.61 %
Supplementary Leverage ratio	5.0	5.71	6.0	6.84

(1) See footnote 2 on the "Components of Citigroup Capital" table above.
(2) Citibank's required capital ratios were the same under the Standardized Approach and the Advanced Approaches framework.

Standardized Approach for Counterparty Credit Risk

In 2020, the U.S. banking agencies adopted the Standardized Approach for Counterparty Credit Risk (SA-CCR) to calculate exposure for all derivative contracts at the netting set level. In addition, SA-CCR is used in numerous other instances throughout the regulatory framework, including but not limited to the Supplementary Leverage ratio, certain components of the GSIB score, single counterparty credit limits and legal lending limits.

As previously disclosed, Citi adopted SA-CCR as of the mandatory compliance date of January 1, 2022. Adoption of SA-CCR increased Citigroup's Standardized RWA by approximately $51 billion, which resulted in a 49 basis points decrease to Citigroup's CET1 Capital ratio under the Standardized Approach on January 1, 2022.

Adoption of SA-CCR also increased Citigroup's Advanced RWA by approximately $29 billion, which resulted in a 29 basis points decrease to Citigroup's CET1 Capital ratio under the Advanced Approaches on January 1, 2022.

Regulatory Capital Standards Developments

Basel III Revisions

As described above, the U.S. banking agencies implemented a number of international capital standards adopted by the Basel Committee on Banking Supervision (Basel Committee), following the Global Financial Crisis regulatory reforms (see the U.S. Basel III rules discussion above). The Basel Committee finalized the Basel III reforms in December 2017, which included revisions to the methodologies in deriving credit, market and operational risk-weighted assets, the imposition of a new aggregate output floor for risk-weighted assets and revisions to the leverage ratio framework.

The U.S. banking agencies may revise the U.S. Basel III rules in the future, in response to the Basel Committee's final Basel III reforms. For information about risks related to changes in regulatory capital requirements, see "Risk Factors —Strategic Risks" below.

Tangible Common Equity, Book Value Per Share, Tangible Book Value Per Share and Return on Equity

Tangible common equity (TCE), as defined by Citi, represents common stockholders' equity less goodwill and identifiable intangible assets (other than mortgage servicing rights (MSRs)). RoTCE represents annualized net income available to common shareholders as a percentage of average TCE. Tangible book value per share represents average TCE divided by average common shares outstanding. Other companies may calculate these measures differently. TCE, RoTCE and tangible book value per share are non-GAAP financial measures. Citi believes TCE, TBV and RoTCE provide alternative measures of capital strength and performance for investors, industry analysts and others.

	At December 31,				
In millions of dollars or shares, except per share amounts	**2022**	2021	2020	2019	2018
Total Citigroup stockholders' equity	$ **201,189**	$ 201,972	$ 199,442	$ 193,242	$ 196,220
Less: Preferred stock	**18,995**	18,995	19,480	17,980	18,460
Common stockholders' equity	$ **182,194**	$ 182,977	$ 179,962	$ 175,262	$ 177,760
Less:					
Goodwill	**19,691**	21,299	22,162	22,126	22,046
Identifiable intangible assets (other than MSRs)	**3,763**	4,091	4,411	4,327	4,636
Goodwill and identifiable intangible assets (other than MSRs) related to assets held-for-sale (HFS)	**589**	510	—	—	—
Tangible common equity (TCE)	$ **158,151**	$ 157,077	$ 153,389	$ 148,809	$ 151,078
Common shares outstanding (CSO)	**1,937.0**	1,984.4	2,082.1	2,114.1	2,368.5
Book value per share (common stockholders' equity/ CSO)	$ **94.06**	$ 92.21	$ 86.43	$ 82.90	$ 75.05
Tangible book value per share (TCE/CSO)	**81.65**	79.16	73.67	70.39	63.79

	For the year ended December 31,				
In millions of dollars	**2022**	2021	2020	2019	2018
Net income available to common shareholders	$ **13,813**	$ 20,912	$ 9,952	$ 18,292	$ 16,871
Average common stockholders' equity	**180,093**	182,421	175,508	177,363	179,497
Average TCE	**155,943**	156,253	149,892	150,994	153,343
Return on average common stockholders' equity	**7.7 %**	11.5 %	5.7 %	10.3 %	9.4 %
RoTCE	**8.9**	13.4	6.6	12.1	11.0

RISK FACTORS

The following discussion presents what management currently believes could be the material risks and uncertainties that could impact Citi's businesses, results of operations and financial condition. Other risks and uncertainties, including those not currently known to Citi or its management, could also negatively impact Citi's businesses, results of operations and financial condition. Thus, the following should not be considered a complete discussion of all of the risks and uncertainties that Citi may face. For additional information about risks and uncertainties that could impact Citi, see "Executive Summary" and each respective business' results of operations above and "Managing Global Risk" below. The following risk factors are categorized to improve the readability and usefulness of the risk factor disclosure, and, while the headings and risk factors generally align with Citi's risk categorization, in certain instances the risk factors may not directly correspond with how Citi categorizes or manages its risks.

MARKET-RELATED RISKS

Macroeconomic, Geopolitical and Other Challenges and Uncertainties Could Continue to Have a Negative Impact on Citi.

Citi has experienced, and could experience in the future, negative impacts to its businesses, results of operations and financial condition as a result of various macroeconomic, geopolitical and other challenges, uncertainties and volatility. These include, among other things, significantly elevated levels of inflation, higher interest rates, global supply shocks and lower economic growth rates, as well as an increasing risk of recession in Europe, the U.S. and other countries.

For example, in 2022, the U.S., the U.K., the EU and other economies experienced significantly higher levels of widespread inflation. As a result, the Federal Reserve Board (FRB) and other central banks have substantially raised interest rates, reduced the size of their balance sheets and taken other actions in an aggressive effort to curb inflation. These actions are expected to slow economic growth, increase the risk of recession and increase the unemployment rate in the U.S. and other countries, all of which would likely adversely affect Citi's consumer and institutional clients, businesses and results of operations. Elevated levels of inflation are also expected to continue to result in higher labor and other costs, thus putting further pressure on Citi's expenses.

Interest rates on loans Citi makes are typically based off or set at a spread over a benchmark interest rate and would likely decline or rise as benchmark rates decline or rise, respectively. While Citi expects its overall net interest income would generally increase due to higher interest rates, higher rates could adversely affect its funding costs, levels of deposits in its consumer and institutional businesses and certain business or product revenues. Citi's net interest income could be adversely affected due to a flattening (a lower spread between shorter-term versus longer-term interest rates) or longer lasting or more severe inversion (shorter-term interest rates exceeding longer-term interest rates) of the interest rate yield curve, as Citi, similar to other banks, typically pays interest on deposits based on shorter-term interest rates and earns money on loans based on longer-term interest rates. For additional information on Citi's interest rate risk, see "Managing Global Risk—Market Risk—Banking Book Interest Rate Risk" below. Additionally, Citi's balance sheet includes interest-rate sensitive fixed-rate assets such as U.S. Treasuries, U.S. agency securities and residential mortgages, among others, whose valuation would be adversely impacted in a rising-rate environment and/or whose hedging costs may increase.

Russia's war in Ukraine has caused supply shocks in energy, food and other commodities markets, worsened inflation, increased cybersecurity risks, increased the risk of recession in Europe and heightened geopolitical tensions. Actions by Russia, and any further measures taken by the U.S. or its allies, could continue to have negative impacts on regional and global energy and other commodities and financial markets and macroeconomic conditions, adversely impacting jurisdictions where Citi operates and Citi's customers, clients and employees. Citi's ability to continue to reduce its operations and exposure in Russia, including completion of the wind-down of its consumer and local commercial banking operations and nearly all of its institutional banking services in the country, may be negatively impacted by macroeconomic challenges and uncertainties, local market conditions, and sanctions and other governmental regulations or actions.

Moreover, Citi's remaining operations in Russia subject Citi to various other risks, among which are foreign currency volatility, including appreciations or devaluations; restrictions arising from retaliatory Russian laws and regulations on the conduct of its business, including, without limitation, its provision to its customers of certain securities services; sanctions or asset freezes; and other deconsolidation events. Examples of triggers that may result in deconsolidation of Citi's subsidiary bank in Russia, AO Citibank, include voluntary or forced sale of ownership or loss of control due to actions of relevant governmental authorities, including expropriation (i.e., the entity becomes subject to the complete control of a government, court, administrator, trustee or regulator); revocation of banking license; and loss of ability to elect a board of directors or appoint members of senior management. In the event of a loss of control of AO Citibank, Citi would be required to write off its net investment in the entity, recognize a CTA loss through earnings and recognize a loss on intercompany liabilities owed by AO Citibank to other Citi entities outside of Russia. In the sole event of a substantial liquidation, as opposed to a loss of control, Citi would be required to recognize the CTA loss through earnings and would evaluate its remaining net investment as circumstances evolve. Additionally, Citi may incur reputational harm if its actions are perceived to be misaligned with Citi's announced reductions of its operations and exposure in Russia. For additional information about these risks, see the operational processes and systems, cybersecurity and emerging markets risk factors and "Managing Global Risk—Other Risks—Country Risk—Russia" below.

COVID-19 is expected to continue to adversely affect global health and could negatively impact macroeconomic conditions in 2023. The extent of the impact remains uncertain

and will largely depend on future developments in China, the U.S. and other countries, such as the severity and duration of the public health consequences, including the course of variants; the public response; and government actions. COVID-19 could again disrupt supply chains, worsen inflation and reduce economic activity. These factors could adversely impact Citi's businesses and results of operations and financial condition.

Additional areas of uncertainty include, among others, economic and geopolitical challenges related to China, including related policy actions, distress in Chinese real estate finance and other credit markets, tensions or conflicts between China and Taiwan and/or between China and the U.S.; significant disruptions and volatility in financial markets, including foreign currency volatility and devaluations and continued strength in the U.S. dollar; other geopolitical tensions and conflicts; protracted or widespread trade tensions; financial market, other economic and political disruption driven by populist movements and governments; natural disasters; other pandemics; and election outcomes, including the effects of divided government in the U.S., such as with respect to raising of the federal debt limit. For example, Citi's market-making businesses can suffer losses resulting from the widening of credit spreads due to unanticipated changes in financial markets. Moreover, adverse developments or downturns in one or more of the world's larger economies would likely have a significant impact on the global economy or the economies of other countries because of global financial and economic linkages.

STRATEGIC RISKS

Citi's Ability to Return Capital to Common Shareholders Substantially Depends on Regulatory Capital Requirements, Including the Results of the CCAR Process and Dodd-Frank Act Regulatory Stress Tests.

Citi's ability to return capital to its common shareholders consistent with its capital planning efforts and targets, whether through its common stock dividend or through a share repurchase program, substantially depends, among other things, on regulatory capital requirements, including the annual recalibration of the Stress Capital Buffer (SCB), which is based upon the results of the CCAR process required by the FRB, and recalibration of the GSIB surcharge.

Citi's ability to return capital also depends on its results of operations and financial condition, including the capital impact related to its remaining divestitures, such as, among other things, any temporary capital impact from CTA losses (net of hedges) between transaction signings and closings and achievement of the expected capital benefits from the divestitures (for additional information, see "Executive Summary" above and the continued investments risk factor below); Citi's effectiveness in planning, managing and calculating its level of risk-weighted assets under both the Advanced Approaches and the Standardized Approach, Supplementary Leverage ratio (SLR) and GSIB surcharge; its implementation and maintenance of an effective capital planning process and management framework; forecasts of macroeconomic conditions; and deferred tax asset (DTA) utilization (see the ability to utilize DTA risk factor below).

Changes in regulatory capital rules, requirements or interpretations could continue to have a material impact on Citi's regulatory capital. For example, on October 1, 2022, Citi's required regulatory CET1 Capital ratio increased to 11.5% from 10.5% due to an increase in the SCB requirement (see below for information on calculation of the SCB). In addition, on January 1, 2023, Citi's required regulatory CET1 Capital ratio further increased to 12% from 11.5% under the Standardized Approach, as the current GSIB surcharge increased to 3.5% from 3.0%. Due to these increases as well as macroeconomic uncertainty, Citi paused common share repurchases beginning as of the third quarter of 2022. In addition, the U.S. banking agencies are considering a number of changes to the U.S. regulatory capital framework in the future, including, but not limited to, revisions to the U.S. Basel III rules, and potential changes to the GSIB surcharge, SLR and discretionary Countercyclical Capital Buffer. All of these potential changes could negatively impact Citi's regulatory capital position or increase Citi's regulatory capital requirements.

All firms subject to CCAR requirements, including Citi, will continue to be subject to a rigorous regulatory evaluation of capital planning practices, including, but not limited to, governance, risk management, data quality and internal controls. Citi's ability to return capital may be adversely impacted if such an evaluation of Citi results in negative findings. The FRB has stated that it expects capital adequacy practices to continue to evolve and to likely be determined by its yearly cross-firm review of capital plan submissions. Similarly, the FRB has indicated that, as part of its stated goal to continually evolve its annual stress testing requirements, several parameters of the annual stress testing process may continue to be altered, including the severity of the stress test scenario, the FRB modeling of Citi's balance sheet, pre-provision net revenue and stress losses, and the addition of components deemed important by the FRB. For information on limitations on Citi's ability to return capital to common shareholders, as well as the CCAR process, supervisory stress test requirements and GSIB surcharge, see "Capital Resources —Overview" and "Capital Resources—Stress Testing Component of Capital Planning" above and the risk management risk factor below.

Beginning January 1, 2022, Citi was required to phase into regulatory capital, at 25% per year, the changes in retained earnings, DTAs and ACL determined upon the January 1, 2020 CECL adoption date, as well as subsequent changes in the ACL through December 31, 2021. The FRB has stated that it plans to maintain its current framework for calculating allowances on loans in the supervisory stress test through the 2023 supervisory stress test cycle, while continuing to evaluate appropriate future enhancements to this framework. The impacts on Citi's capital adequacy of the FRB's incorporation of CECL into its supervisory stress tests on an ongoing basis, and of other potential regulatory changes in the FRB's stress testing methodologies, remain unclear. For additional information regarding the CECL methodology, including the transition provisions related to the adverse regulatory capital effects resulting from adoption of the CECL methodology, see "Capital Resources—Current Regulatory Capital Standards—Regulatory Capital Treatment—Modified

Transition of the Current Expected Credit Losses Methodology" above and Note 1.

In addition, the annual stress testing requirements are integrated into ongoing regulatory capital requirements. Citi's SCB equals the maximum decline in its CET1 Capital ratio under the supervisory severely adverse scenario over a nine-quarter CCAR measurement period, plus four quarters of planned common stock dividends, subject to a minimum requirement of 2.5%. The SCB is calculated by the FRB using its proprietary data and modeling of each firm's results. Accordingly, Citi's SCB may change annually, based on the supervisory stress test results, thus potentially resulting in additional volatility in the calculation of Citi's required regulatory CET1 Capital ratio under the Standardized Approach. Similar to the other regulatory capital buffers, a breach of the SCB may result in graduated limitations on capital distributions. For additional information on the SCB, see "Capital Resources—Regulatory Capital Buffers" above.

Although various uncertainties exist regarding the extent of, and the ultimate impact to Citi from, these changes to the FRB's regulatory capital, stress testing and CCAR regimes, these changes could increase the level of capital Citi is required or elects to hold, including as part of Citi's management buffer, thus potentially impacting the extent to which Citi is able to return capital to shareholders.

Citi Must Continually Review, Analyze and Successfully Adapt to Ongoing Regulatory and Legislative Uncertainties and Changes in the U.S. and Globally.

Citi, its management and its businesses continue to face ongoing regulatory and legislative uncertainties and changes, both in the U.S. and globally. While the areas of ongoing regulatory and legislative uncertainties and changes facing Citi are too numerous to list completely, examples include, but are not limited to (i) potential fiscal, monetary, tax, sanctions and other changes promulgated by the U.S. federal government and other governments, including as a result of priority shifts depending on individuals, political parties and other groups in governmental positions; (ii) potential changes to various aspects of the regulatory capital framework and requirements applicable to Citi, including the Basel III rules (see the capital return risk factor and "Capital Resources—Regulatory Capital Standards Developments" above); and (iii) rapidly evolving legislative and regulatory requirements and other government initiatives in the U.S. and globally related to climate change and other ESG areas that vary, and may conflict, across jurisdictions, including any new disclosure requirements (see the climate change risk factor below). References to "regulatory" refer to both formal regulation and the views and expectations of Citi's regulators in their supervisory roles.

For example, in February 2023, the Consumer Financial Protection Bureau proposed significant changes to the maximum amounts on credit card late fees, which, if adopted as proposed, would reduce credit card fee revenues in Branded cards and Retail services in *PBWM*. In addition, U.S. and international regulatory and legislative initiatives have not always been undertaken or implemented on a coordinated basis, and areas of divergence have developed and continue to develop with respect to their scope, interpretation, timing, structure or approach, leading to inconsistent or even conflicting requirements, including within a single jurisdiction. For example, in 2019, the European Commission adopted, as part of Capital Requirements Directive V (CRD V), a new requirement for major banking groups headquartered outside the EU (which would include Citi) to establish an intermediate EU holding company where the foreign bank has two or more institutions (broadly meaning banks, broker-dealers and similar financial firms) established in the EU. While in some respects the requirement mirrors an existing U.S. requirement for non-U.S. banking organizations to form U.S. intermediate holding companies, the implementation of the EU holding company requirement could lead to additional complexity with respect to Citi's resolution planning, capital and liquidity allocation and efficiency in various jurisdictions.

Further, ongoing regulatory and legislative uncertainties and changes make Citi's and its management's long-term business, balance sheet and strategic budget planning difficult, subject to change and potentially more costly and may impact its results of operations. U.S. and other regulators globally have implemented and continue to discuss various changes to certain regulatory requirements, which would require ongoing assessment by management as to the impact to Citi, its businesses and business planning. For example, while the Basel III regulatory reforms and revised market risk framework have been finalized at the international level, there remain significant uncertainties with respect to the integration of these revisions into the U.S. regulatory capital framework. Business planning is required to be based on possible or proposed rules or outcomes, which can change dramatically upon finalization, or upon implementation or interpretive guidance from numerous regulatory bodies worldwide, and such guidance can change. Regulatory and legislative changes have also significantly increased Citi's compliance risks and costs (see the implementation and interpretation of regulatory changes risk factor below) and can adversely affect Citi's businesses, results of operations and financial condition.

Citi's Continued Investment and Other Initiatives as Part of Its Transformation and Strategic Refresh May Not Be as Successful as It Projects or Expects.

As part of its transformation and other strategic initiatives, Citi continues to make significant investments to improve its risk and control environment, modernize its data and technology infrastructure and further enhance safety and soundness (for additional information on these investments, see "Executive Summary" above and the legal and regulatory proceedings risk factor below). Citi also continues to make business-led investments, as part of the execution of its strategic refresh. For example, Citi has been making investments across the Company, including, for example, hiring front office colleagues and enhancing product capabilities and platforms to improve client digital experiences and add scalability and implementing new capabilities and partnerships. Citi has also been pursuing productivity improvements through various technology and digital initiatives, organizational simplification and location strategies.

Citi's multiyear transformation initiatives involve significant execution complexity, and there is inherent risk that these will not be as productive or effective as Citi expects,

or at all. Conversely, failure to properly invest in and upgrade Citi's technology and processes could result in Citi's inability to meet regulatory expectations, be sufficiently competitive, serve clients effectively and avoid operational errors (for additional information, see the operational processes and systems and legal and regulatory proceedings risk factors below). Moreover, Citi's ability to achieve expected returns on its investments and productivity improvements depends, in part, on factors that it cannot control, including, among others, macroeconomic challenges and uncertainties; customer, client and competitor actions; and ongoing regulatory requirements or changes.

Citi's strategic refresh also includes the divestiture of its remaining consumer banking businesses in *Legacy Franchises*, including Mexico Consumer/SBMM, in order to simplify the Company and enhance its allocation of resources. These divestitures involve significant uncertainty and execution complexity, and may result in additional CTA or other losses, charges or other negative financial or strategic impacts, which could be material (for information about risks related to Citi's operations in Russia, see the macroeconomic challenges and uncertainties risk factor above and "Managing Global Risk—Other Risks—Country Risk—Russia" below). For additional information about CTA losses, see "Executive Summary" and the capital return risk factor above and the incorrect assumptions or estimates risk factor below.

Citi's investment and other initiatives may continue to evolve as its business strategies, the market environment and regulatory expectations change, which could make the initiatives more costly and more challenging to implement, and limit their effectiveness.

Climate Change Presents Various Financial and Non-Financial Risks to Citi and its Customers and Clients.
Climate change presents both immediate and long-term risks to Citi and its customers and clients, with the risks expected to increase over time. Climate risks can arise from both physical risks (those risks related to the physical effects of climate change) and transition risks (risks related to regulatory, market, technological, stakeholder and legal changes from a transition to a low-carbon economy). Physical and transition risks can manifest themselves differently across Citi's risk categories in the short, medium and long terms. Physical risks from climate change include acute risks, such as hurricanes and floods, as well as consequences of chronic changes in climate, such as rising sea levels, prolonged droughts and systemic changes to geographies and any resulting population migration. Such physical risks could have adverse financial, operational and other impacts on Citi, both directly on its business and operations, and indirectly as a result of impacts to Citi's clients, customers, vendors and other counterparties. These impacts can include destruction, damage or impairment of properties and other assets, disruptions to business operations and supply chains and reduced availability or increase in the cost of insurance. Physical risks can also impact Citi's credit risk exposures, for example, in its mortgage and commercial real estate lending businesses.

Transition risks may arise from changes in regulations or market preferences toward low-carbon industries or sectors, which in turn could have negative impacts on asset values, results of operations or the reputations of Citi and its customers and clients. For example, Citi's corporate credit exposures include oil and gas, power and other industries that may experience reduced demand for carbon-intensive products due to the transition to a low-carbon economy. Failure to adequately consider transition risk in developing and executing on its business strategy could lead to a loss of market share, lower revenues and higher credit costs.

Additionally, if Citi's response to climate change is perceived to be ineffective or insufficient or Citi is unable to achieve its objectives or commitments relating to climate change, its businesses, reputation, attractiveness to certain investors and efforts to recruit and retain employees may suffer. For example, the need to decarbonize in a gradual and orderly way, while promoting energy security, may lead to continued exposure to carbon-intensive activity that in turn may raise such reputational risks.

Even as some regulators seek to mandate additional disclosure of climate-related information, Citi's ability to comply with such requirements and conduct more robust climate-related risk analyses may be hampered by lack of information and reliable data. Data on climate-related risks is limited in availability, often based on estimated or unverified figures, collected and reported on a lag, and variable in quality. Modeling capabilities to analyze climate-related risks and interconnections are improving, but remain incomplete. Moreover, U.S. and non-U.S. banking regulators and others are increasingly focusing on the issue of climate risk at financial institutions, both directly and with respect to their clients. For example, in December 2022, the FRB requested comment on draft principles that would provide a high-level framework for the safe and sound management of exposures to climate-related financial risks for FRB-supervised financial institutions with more than $100 billion in assets.

Legislative and regulatory changes and uncertainties regarding climate-related risk management and disclosures are likely to result in higher regulatory, compliance, credit, reputational and other risks and costs for Citi (for additional information, see the ongoing regulatory and legislative uncertainties and changes risk factor above). In addition, Citi could face increased regulatory, reputational and legal scrutiny as a result of its climate risk, sustainability and other ESG-related commitments and disclosures. Citi also faces potentially conflicting anti-ESG initiatives from certain U.S. state governments that may impact its ability to conduct certain business within those jurisdictions, as well as from Congress.

For information on Citi's climate and other sustainability initiatives, see "Sustainability and Other ESG Matters" below. For additional information on Citi's management of climate risk, see "Managing Global Risk—Strategic Risks—Climate Risk" below.

Citi's Ability to Utilize Its DTAs, and Thus Reduce the Negative Impact of the DTAs on Citi's Regulatory Capital, Will Be Driven by Its Ability to Generate U.S. Taxable Income.
At December 31, 2022, Citi's net DTAs were $27.7 billion, net of a valuation allowance of $2.4 billion, of which $10.9 billion was deducted from Citi's CET1 Capital under the U.S.

Basel III rules, primarily relating to net operating losses, foreign tax credit and general business credit carry-forwards. Of the net DTAs at December 31, 2022, $1.9 billion related to foreign tax credit (FTC) carry-forwards, net of a valuation allowance. The carry-forward utilization period for FTCs is 10 years and represents the most time-sensitive component of Citi's DTAs. The FTC carry-forwards at December 31, 2022 expire over the period of 2025–2029. Citi must utilize any FTCs generated in the then-current-year tax return prior to utilizing any carry-forward FTCs.

The accounting treatment for realization of DTAs, including FTCs, is complex and requires significant judgment and estimates regarding future taxable earnings in the jurisdictions in which the DTAs arise and available tax planning strategies. Forecasts of future taxable earnings will depend upon various factors, including, among others, macroeconomic conditions. In addition, any future increase in U.S. corporate tax rates could result in an increase in Citi's DTA, which may subject more of Citi's existing DTA to exclusion from regulatory capital while improving Citi's ability to utilize its FTC carry-forwards.

Citi's overall ability to realize its DTAs will primarily be dependent upon its ability to generate U.S. taxable income in the relevant tax carry-forward periods. Although utilization of FTCs in any year is generally limited to 21% of foreign source taxable income in that year, overall domestic losses (ODL) that Citi has incurred in the past allow it to reclassify domestic source income as foreign source. Failure to realize any portion of the net DTAs would have a corresponding negative impact on Citi's net income and financial returns. Citi has not been and does not expect to be subject to the Base Erosion Anti-Abuse Tax (BEAT), which, if applicable to Citi in any given year, would have a significantly adverse effect on both Citi's net income and regulatory capital. For additional information on Citi's DTAs, including FTCs, see "Significant Accounting Policies and Significant Estimates—Income Taxes" below and Notes 1 and 9.

Citi's Interpretation or Application of the Complex Tax Laws to Which It Is Subject Could Differ from Those of Governmental Authorities, Which Could Result in Litigation or Examinations and the Payment of Additional Taxes, Penalties or Interest.

Citi is subject to various income-based tax laws of the U.S. and its states and municipalities, as well as the numerous non-U.S. jurisdictions in which it operates. These tax laws are inherently complex, and Citi must make judgments and interpretations about the application of these laws to its entities, operations and businesses.

For example, the Organization for Economic Cooperation and Development (OECD) Pillar 2 initiative contemplates a 15% global minimum tax with respect to earnings in each separate country. EU member states are required to adopt the OECD Pillar 2 rules in 2023, and other non-U.S. countries are expected to follow suit. Under these rules, Citi will be required to pay a "top-up" tax to the extent that Citi's effective tax rate in any given country is below 15%. The U.S. is not expected to pass Pillar 2 legislation in the near term, but the top-up tax can be collected by other countries. While many aspects of the application of the rules remain uncertain, Citi does not expect a material effect to its earnings.

In addition, Citi is subject to litigation or examinations with U.S. and non-U.S. tax authorities regarding non-income-based tax matters. While Citi has appropriately reserved for such matters where there is a probable loss, and has disclosed, as reasonably possible, matters that are more-likely-than-not, the outcome from the matters may be different than Citi's expectations. Citi's interpretations or application of the tax laws, including with respect to withholding, stamp, service and other non-income taxes, could differ from that of the relevant governmental taxing authority, which could result in the requirement to pay additional taxes, penalties or interest, which could be material. See Note 29 for additional information on litigation and examinations involving non-U.S. tax authorities.

A Deterioration in or Failure to Maintain Citi's Co-Branding or Private Label Credit Card Relationships Could Have a Negative Impact on Citi.

Citi has co-branding and private label relationships through its Branded cards and Retail services credit card businesses with various retailers and merchants, whereby in the ordinary course of business Citi issues credit cards to customers of the retailers or merchants. The five largest relationships across both businesses in U.S. Personal Banking constituted an aggregate of approximately 10% of Citi's revenues in 2022 (for additional information, see "*Personal Banking and Wealth Management*" above). Citi's co-branding and private label agreements often provide for shared economics between the parties and generally have a fixed term.

Competition among card issuers, including Citi, for these relationships is significant, and Citi may not be able to maintain such relationships on existing terms or at all. Citi's co-branding and private label relationships could also be negatively impacted by, among other things, the general economic environment, including the impacts of significantly elevated levels of inflation, higher interest rates, global supply shocks and lower economic growth rates, as well as an increasing risk of recession; changes in consumer sentiment, spending patterns and credit card usage behaviors; a decline in sales and revenues, partner store closures, any reduction in air and business travel, or other operational difficulties of the retailer or merchant; early termination due to a contractual breach or exercise of other early termination right; or other factors, including bankruptcies, liquidations, restructurings, consolidations or other similar events, whether due to the challenging macroeconomic environment or otherwise.

These events, particularly early termination and bankruptcies or liquidations, could negatively impact the results of operations or financial condition of Branded cards, Retail services or Citi as a whole, including as a result of loss of revenues, increased expenses, higher cost of credit, impairment of purchased credit card relationships and contract-related intangibles or other losses (see Note 16 for information on Citi's credit card related intangibles generally).

Citi's Inability in Its Resolution Plan Submissions to Address Any Shortcomings or Deficiencies or Guidance Provided Could Subject Citi to More Stringent Capital, Leverage or Liquidity Requirements, or Restrictions on Its Growth, Activities or Operations, and Could Eventually Require Citi to Divest Assets or Operations.

Title I of the Dodd-Frank Act requires Citi to prepare and submit a plan to the FRB and the FDIC for the orderly resolution of Citigroup (the bank holding company) and its significant legal entities under the U.S. Bankruptcy Code in the event of future material financial distress or failure. On November 22, 2022, the FRB and FDIC issued feedback on the resolution plans filed on July 1, 2021 by the eight U.S. GSIBs, including Citi. The FRB and FDIC identified one shortcoming, but no deficiencies, in Citi's 2021 resolution plan. The shortcoming related to data integrity and data quality management issues, specifically, weaknesses in Citi's processes and practices for producing certain data that could materially impact its resolution capabilities. If a shortcoming is not satisfactorily explained or addressed before, or in, the submission of the next resolution plan, the shortcoming may be found to be a deficiency in the next resolution plan. For additional information on Citi's resolution plan submissions, see "Managing Global Risk—Liquidity Risk" below.

Under Title I, if the FRB and the FDIC jointly determine that Citi's resolution plan is not "credible" (which, although not defined, is generally believed to mean the regulators do not believe the plan is feasible or would otherwise allow Citi to be resolved in a way that protects systemically important functions without severe systemic disruption), or would not facilitate an orderly resolution of Citi under the U.S. Bankruptcy Code, and Citi fails to resubmit a resolution plan that remedies any identified deficiencies, Citi could be subjected to more stringent capital, leverage or liquidity requirements, or restrictions on its growth, activities or operations. If within two years from the imposition of any such requirements or restrictions Citi has still not remediated any identified deficiencies, then Citi could eventually be required to divest certain assets or operations. Any such restrictions or actions would negatively impact Citi's reputation, market and investor perception, operations and strategy.

Citi's Performance and Its Ability to Effectively Execute Its Transformation and Other Strategic Initiatives Could Be Negatively Impacted if It Is Not Able to Compete for, Retain and Motivate Highly Qualified Colleagues.

Recent employment conditions and inflationary pressures have made the competition to hire and retain qualified employees significantly more challenging and costly. Citi's performance and the performance of its individual businesses largely depend on the talents and efforts of its diverse and highly qualified colleagues. Specifically, Citi's continued ability to compete in each of its lines of business, to manage its businesses effectively and to execute its transformation and other strategic initiatives, including, for example, hiring front office colleagues to grow businesses or hiring colleagues to support transformation of its risk, controls, data and finance infrastructure and compliance, depends on its ability to attract new colleagues and to retain and motivate its existing colleagues. If Citi is unable to continue to attract, retain and motivate the most highly qualified colleagues, Citi's performance, including its competitive position, the execution of its transformation and other strategic initiatives and its results of operations could be negatively impacted.

Citi's ability to attract, retain and motivate colleagues depends on numerous factors, some of which are outside of its control. For example, the competition for talent recently has been particularly intense, and attrition rates have risen due to factors such as low unemployment, a strong job market with a large number of open positions, and changes in worker's expectations, concerns and preferences, in part due to the pandemic, including an increased demand for remote work options and other job flexibility. Also, the banking industry generally is subject to more comprehensive regulation of employee compensation than other industries, including deferral and clawback requirements for incentive compensation, which can make it unusually challenging for Citi to compete in labor markets against businesses, including for example technology companies, that are not subject to such regulation. Other factors that could impact its ability to attract, retain and motivate colleagues include, among other things, Citi's presence in a particular market or region, the professional and development opportunities and employee benefits it offers, its reputation and its diversity. For information on Citi's colleagues and workforce management, see "Human Capital Resources and Management" below.

Citi Faces Increased Competitive Challenges, Including from Financial Services and Other Companies and Emerging Technologies.

Citi operates in an increasingly evolving and competitive business environment, which includes both financial and non-financial services firms, such as traditional banks, online banks, financial technology companies and others. These companies compete on the basis of, among other factors, size, reach, quality and type of products and services offered, price, technology and reputation. Certain competitors may be subject to different and, in some cases, less stringent legal and regulatory requirements, whether due to size, jurisdiction, entity type or other factors, placing Citi at a competitive disadvantage.

For example, Citi competes with other financial services companies in the U.S. and globally that continue to develop and introduce new products and services. In recent years, non-traditional financial services firms, such as financial technology companies, have begun to offer services traditionally provided by financial institutions, such as Citi, and have sought bank charters to provide these services. These firms attempt to use technology and mobile platforms to enhance the ability of companies and individuals to borrow, save and invest money. Emerging technologies have the potential to intensify competition and accelerate disruption in the financial services industry. For example, despite recent turmoil in the digital asset market, there is sustained interest from clients and investors in digital assets. Financial services firms and other market participants have begun to offer services related to those assets. However, Citi may not be able to provide the same or similar services for legal or regulatory reasons and due to increased compliance and other risks. In

addition, changes in the payments space (e.g., instant and 24x7 payments) are accelerating, and, as a result, certain of Citi's products and services could become less competitive.

Increased competition and emerging technologies have required and could require Citi to change or adapt its products and services to attract and retain customers or clients or to compete more effectively with competitors, including new market entrants. Simultaneously, as Citi develops new products and services leveraging emerging technologies, new risks may emerge that, if not designed and governed adequately, may result in control gaps and in Citi operating outside of its risk appetite. For example, instant and 24x7 payments products could be accompanied by challenges to forecasting and managing liquidity, as well as increased operational and compliance risks.

Moreover, Citi relies on third parties to support certain of its product and service offerings, which may put Citi at a disadvantage to competitors who may directly offer a broader array of products and services. Also, Citi's businesses, results of operations and reputation may suffer if any third party is unable to provide adequate support for such product and service offerings, whether due to operational incidents or otherwise (for additional information, see the operational processes and systems, cybersecurity and emerging markets risk factors below).

To the extent that Citi is not able to compete effectively with financial technology companies and other firms, Citi could be placed at a competitive disadvantage, which could result in loss of customers and market share, and its businesses, results of operations and financial condition could suffer. For additional information on Citi's competitors, see the co-brand and private label cards and qualified colleagues risk factors above and "Supervision, Regulation and Other—Competition" below.

OPERATIONAL RISKS

A Failure or Disruption of Citi's Operational Processes or Systems Could Negatively Impact Its Reputation, Customers, Clients, Businesses or Results of Operations and Financial Condition.

Citi's global operations rely heavily on its technology, including the accurate, timely and secure processing, management, storage and transmission of confidential transactions, data and other information as well as the monitoring of a substantial amount of data and complex transactions in real time. Citi obtains and stores an extensive amount of personal and client-specific information for its consumer and institutional customers and clients, and must accurately record and reflect their extensive account transactions. Citi's operations must also comply with complex and evolving laws and regulations in the countries in which it operates. With the evolving proliferation of new technologies and the increasing use of the internet, mobile devices and cloud technologies to conduct financial transactions and customers' and clients' increasing use of online banking and trading systems and other platforms, large global financial institutions such as Citi have been, and will continue to be, subject to an ever-increasing risk of operational loss, failure or disruption, including as a result of cyber or information security incidents (for additional information, see the cybersecurity risk factor below).

Although Citi has continued to upgrade its technology, including systems to automate processes and enhance efficiencies, operational incidents are unpredictable and can arise from numerous sources, not all of which are fully within Citi's control. These include, among others, human error, such as manual transaction processing errors, which can be exacerbated by staffing challenges and processing backlogs; fraud or malice on the part of employees or third parties; operational or execution failures or deficiencies by third parties; insufficient (or limited) straight-through processing between legacy systems and any failure to design and effectively operate controls that mitigate operational risks associated with those legacy systems leading to potential risk of errors and operating losses; accidental system or technological failure; electrical or telecommunication outages; failures of or cyber incidents involving computer servers or infrastructure; or other similar losses or damage to Citi's property or assets (see also the climate change risk factor above).

For example, Citi has experienced and could experience further losses associated with manual transaction processing errors, including erroneous payments to lenders or manual errors by Citi traders that cause system and market disruptions and losses for Citi and its clients. Irrespective of the sophistication of the technology utilized by Citi, there will always be some room for human error. In view of the large transactions in which Citi engages, such errors could result in significant losses. While Citi has change management processes in place to appropriately upgrade its operational processes and systems to ensure that any changes introduced do not adversely impact security and operational continuity, such change management can fail or be ineffective. Operational incidents can also arise as a result of failures by third parties with which Citi does business, such as failures by internet, mobile technology and cloud service providers or other vendors to adequately follow procedures or processes, safeguard their systems or prevent system disruptions or cyberattacks.

Incidents that impact information security and/or technology operations may cause disruptions and/or malfunctions within Citi's businesses (e.g., the temporary loss of availability of Citi's online banking system or mobile banking platform), as well as the operations of its clients, customers or other third parties. In addition, operational incidents could involve the failure or ineffectiveness of internal processes or controls. Given Citi's global footprint and the high volume of transactions processed by Citi, certain failures, errors or actions may be repeated or compounded before they are discovered and rectified, which would further increase the consequences and costs. Operational incidents could result in financial losses as well as misappropriation, corruption or loss of confidential and other information or assets, which could significantly negatively impact Citi's reputation, customers, clients, businesses or results of operations and financial condition. Cyber-related and other operational incidents can also result in legal and regulatory actions or proceedings, fines and other costs (see the legal and regulatory proceedings risk factor below).

For information on Citi's management of operational risk, see "Managing Global Risk—Operational Risk" below.

Citi's and Third Parties' Computer Systems and Networks Will Continue to Be Susceptible to an Increasing Risk of Continually Evolving, Sophisticated Cybersecurity Incidents That Could Result in the Theft, Loss, Misuse or Disclosure of Confidential Client or Customer Information, Damage to Citi's Reputation, Additional Costs to Citi, Regulatory Penalties, Legal Exposure and Financial Losses.

Citi's computer systems, software and networks are subject to ongoing cyber incidents, such as unauthorized access, loss or destruction of data (including confidential client information), account takeovers, disruptions of service, phishing, malware, ransomware, computer viruses or other malicious code, cyberattacks and other similar events. These threats can arise from external parties, including cyber criminals, cyber terrorists, hacktivists (individuals or groups using cyberattacks to promote a political or social agenda) and nation-state actors, as well as insiders who knowingly or unknowingly engage in or enable malicious cyber activities.

The increasing use of mobile and other digital banking platforms and services, cloud technologies and connectivity solutions to facilitate remote working for Citi's employees all increase Citi's exposure to cybersecurity risks. Citi's wind-down of its businesses in Russia could also increase its susceptibility to cyberattacks (for additional information about Citi's exposures related to its Russia operations, see the macroeconomic and geopolitical risk factor above and "Managing Global Risk—Other Risks—Country Risk—Russia" below).

Third parties with which Citi does business, as well as retailers and other third parties with which Citi's customers do business, may also be sources of cybersecurity risks, particularly where activities of customers are beyond Citi's security and control systems. For example, Citi outsources certain functions, such as processing customer credit card transactions, uploading content on customer-facing websites and developing software for new products and services. These relationships allow for the storage and processing of customer information by third-party hosting of, or access to, Citi websites, which could lead to compromise or the potential to introduce vulnerable or malicious code, resulting in security breaches impacting Citi customers. Furthermore, because financial institutions are becoming increasingly interconnected with central agents, exchanges and clearing houses, including as a result of derivatives reforms over the last few years, Citi has increased exposure to cyberattacks through third parties. While many of Citi's agreements with third parties include indemnification provisions, Citi may not be able to recover sufficiently, or at all, under these provisions to adequately offset any losses Citi may incur from third-party cyber incidents.

Citi and some of its third-party partners have been subject to attempted and sometimes successful cyberattacks from external sources over the last several years, including (i) denial of service attacks, which attempt to interrupt service to clients and customers; (ii) hacking and malicious software installations intended to gain unauthorized access to information systems or to disrupt those systems; (iii) data breaches due to unauthorized access to customer account data; and (iv) malicious software attacks on client systems, in attempts to gain unauthorized access to Citi systems or client data under the guise of normal client transactions. While Citi's monitoring and protection services were able to detect and respond to the incidents targeting its systems before they became significant, they still resulted in limited losses in some instances as well as increases in expenditures to monitor against the threat of similar future cyber incidents. There can be no assurance that such cyber incidents will not occur again, and they could occur more frequently, via novel tactics and on a more significant scale.

Further, although Citi devotes significant resources to implement, maintain, monitor and regularly upgrade its systems and networks with measures such as intrusion detection and prevention and firewalls to safeguard critical business applications, there is no guarantee that these measures or any other measures can provide absolute security. Because the techniques used to initiate cyberattacks change frequently or, in some cases, are not recognized until launched or even later, Citi may be unable to implement effective preventive measures or otherwise proactively address these methods. In addition, given the evolving nature of cyber threat actors and the frequency and sophistication of the cyber activities they carry out, the determination of the severity and potential impact of a cyber incident may not become apparent for a substantial period of time following discovery of the incident. Also, while Citi engages in certain actions to reduce the exposure resulting from outsourcing, such as performing security control assessments of third-party vendors and limiting third-party access to the least privileged level necessary to perform job functions, these actions cannot prevent all third-party-related cyberattacks or data breaches.

Cyber incidents can result in the disclosure of personal, confidential or proprietary customer, client or employee information, damage to Citi's reputation with its clients and the market, customer dissatisfaction and additional costs to Citi, including expenses such as repairing systems, replacing customer payment cards, credit monitoring or adding new personnel or protection technologies. Cyber incidents can also result in regulatory penalties, loss of revenues, exposure to litigation and other financial losses, including loss of funds, to both Citi and its clients and customers and disruption to Citi's operational systems (for additional information on the potential impact of operational disruptions, see the operational processes and systems risk factor above). Moreover, the increasing risk of cyber incidents has resulted in increased legislative and regulatory scrutiny of firms' cybersecurity protection services and calls for additional laws and regulations to further enhance protection of consumers' personal data.

While Citi maintains insurance coverage that may, subject to policy terms and conditions including significant self-insured deductibles, cover certain aspects of cyber risks, such insurance coverage may be insufficient to cover all losses and may not take into account reputational harm, the costs of which are impossible to quantify.

For additional information about Citi's management of cybersecurity risk, see "Managing Global Risk—Operational Risk—Cybersecurity Risk" below.

Changes or Errors in Accounting Assumptions, Judgments or Estimates, or the Application of Certain Accounting Principles, Could Result in Significant Losses or Other Adverse Impacts.

U.S. GAAP requires Citi to use certain assumptions, judgments and estimates in preparing its financial statements, including, among other items, the estimate of the ACL; reserves related to litigation, regulatory and tax matters; valuation of DTAs; the fair values of certain assets and liabilities; and the assessment of goodwill and other assets for impairment. These assumptions, judgments and estimates are inherently limited because they involve techniques, including the use of historical data in many circumstances, that cannot anticipate every economic and financial outcome in the markets in which Citi operates, nor can they anticipate the specifics and timing of such outcomes. For example, many models used by Citi include assumptions about correlation or lack thereof among prices of various asset classes or other market indicators that may not hold in times of market stress, limited liquidity or other unforeseen circumstances. If Citi's assumptions, judgments or estimates underlying its financial statements are incorrect or differ from actual or subsequent events, Citi could experience unexpected losses or other adverse impacts, some of which could be significant. Citi could also experience declines in its stock price, be subject to legal and regulatory proceedings and incur fines and other losses. For additional information on the key areas for which assumptions and estimates are used in preparing Citi's financial statements, see "Significant Accounting Policies and Significant Estimates" below and Notes 1 and 15.

For example, the CECL methodology requires that Citi provide reserves for a current estimate of lifetime expected credit losses for its loan portfolios and other financial assets, as applicable, at the time those assets are originated or acquired. This estimate is adjusted each period for changes in expected lifetime credit losses. Citi's ACL estimate depends upon its CECL models and assumptions; forecasted macroeconomic conditions, including, among other things, the U.S. unemployment rate and U.S. inflation-adjusted gross domestic product (real GDP); and the credit indicators, composition and other characteristics of Citi's loan portfolios and other applicable financial assets. These model assumptions and forecasted macroeconomic conditions will change over time, resulting in variability in Citi's ACL, and, thus, impact its results of operations and financial condition, as well as regulatory capital due to the CECL phase-in (for additional information on the CECL phase-in, see the capital return risk factor above).

Moreover, Citi has incurred losses related to its foreign operations that are reported in the CTA components of *Accumulated other comprehensive income (loss) (AOCI)*. In accordance with U.S. GAAP, a sale, substantial liquidation or other deconsolidation event of any foreign operations, such as those related to Citi's remaining divestitures or legacy businesses, would result in reclassification of any foreign CTA component of *AOCI* related to that foreign operation, including related hedges and taxes, into Citi's earnings. For example, in the second quarter of 2022, Citi incurred a CTA loss (net of hedges) in *AOCI* released to earnings of approximately $400 million ($345 million after-tax) related to the substantial liquidation of a legacy U.K. consumer operation (for additional information, see "*Legacy Franchises*" and "*Corporate/Other*" above and Note 2). For additional information on Citi's accounting policy for foreign currency translation and its foreign CTA components of *AOCI*, see Notes 1 and 20.

Changes to Financial Accounting and Reporting Standards or Interpretations Could Have a Material Impact on How Citi Records and Reports Its Financial Condition and Results of Operations.

Periodically, the Financial Accounting Standards Board (FASB) issues financial accounting and reporting standards that govern key aspects of Citi's financial statements or interpretations thereof when those standards become effective, including those areas where Citi is required to make assumptions or estimates. Changes to financial accounting or reporting standards or interpretations, whether promulgated or required by the FASB, the SEC, banking regulators or others, could present operational challenges and could also require Citi to change certain of the assumptions or estimates it previously used in preparing its financial statements, which could negatively impact how it records and reports its financial condition and results of operations generally and/or with respect to particular businesses. See Note 1 for additional information on Citi's accounting policies and changes in accounting, including the expected impacts on Citi's results of operations and financial condition.

If Citi's Risk Management Processes, Strategies or Models Are Deficient or Ineffective, Citi May Incur Significant Losses and Its Regulatory Capital and Capital Ratios Could Be Negatively Impacted.

Citi utilizes a broad and diversified set of risk management and mitigation processes and strategies, including the use of models in enacting processes and strategies as well as in analyzing and monitoring the various risks Citi assumes in conducting its activities. For example, Citi uses models as part of its comprehensive stress testing initiatives across the Company. Citi also relies on data to aggregate, assess and manage various risk exposures. Management of these risks is made more challenging within a global financial institution such as Citi, particularly given the complex, diverse and rapidly changing financial markets and conditions in which Citi operates as well as that losses can occur unintentionally from untimely, inaccurate or incomplete processes and data. As discussed below, in October 2020, Citigroup and Citibank entered into consent orders with the FRB and OCC that require Citigroup and Citibank to make improvements in various aspects of enterprise-wide risk management, compliance, data quality management and governance and internal controls (see "Citi's Consent Order Compliance" above and the legal and regulatory proceedings risk factor below).

Citi's risk management processes, strategies and models are inherently limited because they involve techniques, including the use of historical data in many circumstances, assumptions and judgments that cannot anticipate every economic and financial outcome in the markets in which Citi operates, nor can they anticipate the specifics and timing of

such outcomes. For example, many models used by Citi include assumptions about correlation or lack thereof among prices of various asset classes or other market indicators that may not necessarily hold in times of market stress, limited liquidity or other unforeseen circumstances. Citi could incur significant losses, and its regulatory capital and capital ratios could be negatively impacted, if Citi's risk management processes, including its ability to manage and aggregate data in a timely and accurate manner, strategies or models are deficient or ineffective. Such deficiencies or ineffectiveness could also result in inaccurate financial, regulatory or risk reporting.

Moreover, Citi's Basel III regulatory capital models, including its credit, market and operational risk models, currently remain subject to ongoing regulatory review and approval, which may result in refinements, modifications or enhancements (required or otherwise) to these models. Citi is required to notify and obtain preapproval from both the OCC and FRB prior to implementing certain risk-weighted asset treatments, as well as certain model changes, resulting in a more challenging environment within which Citi must operate in managing its risk-weighted assets. Modifications or requirements resulting from these ongoing reviews, as well as any future changes or guidance provided by the U.S. banking agencies regarding the regulatory capital framework applicable to Citi, have resulted in, and could continue to result in, significant changes to Citi's risk-weighted assets. These changes can negatively impact Citi's capital ratios and its ability to achieve its regulatory capital requirements.

CREDIT RISKS

Credit Risk and Concentrations of Risk Can Increase the Potential for Citi to Incur Significant Losses.

Citi has credit exposures to consumer, corporate and public sector borrowers and other counterparties in the U.S. and various countries and jurisdictions globally, including end-of-period consumer loans of $368 billion and end-of-period corporate loans of $289 billion at December 31, 2022. For additional information on Citi's corporate and consumer loan portfolios, see "Managing Global Risk—Corporate Credit" and "—Consumer Credit" below.

A default by a borrower or other counterparty, or a decline in the credit quality or value of any underlying collateral, exposes Citi to credit risk. Despite Citi's target client strategy, various macroeconomic, geopolitical and other factors, among other things, can increase Citi's credit risk and credit costs, particularly for certain sectors, industries or countries (for additional information, see the co-branding and private label credit card and macroeconomic challenges and uncertainties risk factors above and the emerging markets risk factor below). For example, a weakening of economic conditions can adversely affect borrowers' ability to repay their obligations, as well as result in Citi being unable to liquidate the collateral it holds or forced to liquidate the collateral at prices that do not cover the full amount owed to Citi. Citi is also a member of various central clearing counterparties and could incur financial losses as a result of defaults by other clearing members due to the requirements of clearing members to share losses. Additionally, due to the interconnectedness among financial institutions, concerns about the creditworthiness of or defaults by a financial institution could spread to other financial market participants and result in market-wide losses.

While Citi provides reserves for expected losses for its credit exposures, as applicable, such reserves are subject to judgments and estimates that could be incorrect or differ from actual future events. Under the CECL accounting standard, the ACL reflects expected losses, which has resulted in and could lead to additional volatility in the allowance and the provision for credit losses as forecasts of economic conditions change. For additional information, see the incorrect assumptions or estimates and changes to financial accounting and reporting standards risk factors above. For additional information on Citi's ACL, see "Significant Accounting Policies and Significant Estimates" below and Notes 1 and 15. For additional information on Citi's credit and country risk, see each respective business's results of operations above and "Managing Global Risk—Credit Risk" and "Managing Global Risk—Other Risks—Country Risk" below and Notes 14 and 15.

Concentrations of risk to clients or counterparties engaged in the same or related industries or doing business in a particular geography, especially credit and market risks, can also increase Citi's risk of significant losses. For example, Citi routinely executes a high volume of securities, trading, derivative and foreign exchange transactions with non-U.S. sovereigns and with counterparties in the financial services industry, including banks, insurance companies, investment banks, governments, central banks and other financial institutions. Moreover, Citi has indemnification obligations in connection with various transactions that expose it to concentrations of risk, including credit risk from hedging or reinsurance arrangements related to those obligations (for additional information about these exposures, see Note 27). A rapid deterioration of a large borrower or other counterparty or within a sector or country in which Citi has large exposures or indemnifications or unexpected market dislocations could lead to concerns about the creditworthiness of other borrowers or counterparties in related or dependent industries, and such conditions could cause Citi to incur significant losses.

LIQUIDITY RISKS

Citi's Businesses, Results of Operations and Financial Condition Could Be Negatively Impacted if It Does Not Effectively Manage Its Liquidity.

As a large, global financial institution, adequate liquidity and sources of funding are essential to Citi's businesses. Citi's liquidity and sources of funding can be significantly and negatively impacted by factors it cannot control, such as general disruptions in the financial markets, governmental fiscal and monetary policies, regulatory changes or negative investor perceptions of Citi's creditworthiness, unexpected increases in cash or collateral requirements and the consequent inability to monetize available liquidity resources. Citi competes with other banks and financial institutions for both institutional and consumer deposits, which represent Citi's most stable and lowest cost source of long-term funding. The competition for deposits has continued to increase in recent

years, including as a result of online banks and digital banking and fixed income alternatives for customer funds. Furthermore, it is expected that the market for deposits will become more competitive in the current higher interest rate environment.

Citi's costs to obtain and access wholesale funding are directly related to changes in interest and currency exchange rates and its credit spreads. For example, during 2022, interest rates in the U.S. increased significantly, thus, affecting Citi's cost of funding. Changes in Citi's credit spreads are driven by both external market factors and factors specific to Citi, such as negative views by investors of the financial services industry or Citi's financial prospects, and can be highly volatile. For additional information on Citi's primary sources of funding, see "Managing Global Risk—Liquidity Risk" below.

Citi's ability to obtain funding may be impaired and its cost of funding could also increase if other market participants are seeking to access the markets at the same time or to a greater extent than expected, or if market appetite for corporate debt securities declines, as is likely to occur in a liquidity stress event or other market crisis. Citi's ability to sell assets may also be impaired if other market participants are seeking to sell similar assets at the same time or a liquid market does not exist for such assets. A sudden drop in market liquidity could also cause a temporary or protracted dislocation of underwriting and capital markets activity. In addition, clearing organizations, central banks, clients and financial institutions with which Citi interacts may exercise the right to require additional collateral during challenging market conditions, which could further impair Citi's liquidity. If Citi fails to effectively manage its liquidity, its businesses, results of operations and financial condition could be negatively impacted.

In addition, as a holding company, Citigroup Inc. relies on interest, dividends, distributions and other payments from its subsidiaries to fund dividends as well as to satisfy its debt and other obligations. Several of Citi's U.S. and non-U.S. subsidiaries are or may be subject to capital adequacy or other liquidity, regulatory or contractual restrictions on their ability to provide such payments, including any local regulatory stress test requirements and inter-affiliate arrangements entered into in connection with Citigroup Inc.'s resolution plan. Citigroup Inc.'s broker-dealer and bank subsidiaries are subject to restrictions on their ability to lend or transact with affiliates, as well as restrictions on their ability to use funds deposited with them in brokerage or bank accounts to fund their businesses. Limitations on the payments that Citigroup Inc. receives from its subsidiaries could also impact its liquidity. A bank holding company is required by law to act as a source of financial and managerial strength for its subsidiary banks. As a result, the FRB may require Citigroup Inc. to commit resources to its subsidiary banks even if doing so is not otherwise in the interests of Citigroup Inc. or its shareholders or creditors, reducing the amount of funds available to meet its obligations.

Credit Rating Agencies Continuously Review the Credit Ratings of Citi and Certain of Its Subsidiaries, and a Ratings Downgrade Could Adversely Impact Citi's Funding and Liquidity.

The credit rating agencies, such as Fitch Ratings, Moody's Investors Services and S&P Global Ratings, continuously evaluate Citi and certain of its subsidiaries. Their ratings of Citi and its rated subsidiaries' long-term debt and short-term obligations are based on several factors, including the financial strength of Citi and such subsidiaries, as well as factors that are not entirely within the control of Citi and its subsidiaries, such as the agencies' proprietary rating methodologies and assumptions, and conditions affecting the financial services industry and markets generally.

Citi and its subsidiaries may not be able to maintain their current respective ratings and outlooks. Rating downgrades could negatively impact Citi and its rated subsidiaries' ability to access the capital markets and other sources of funds as well as the costs of those funds. A ratings downgrade could also have a negative impact on Citi and its rated subsidiaries' ability to obtain funding and liquidity due to reduced funding capacity and the impact from derivative triggers, which could require Citi and its rated subsidiaries to meet cash obligations and collateral requirements. In addition, a ratings downgrade could have a negative impact on other funding sources such as secured financing and other margined transactions for which there may be no explicit triggers, and on contractual provisions and other credit requirements of Citi's counterparties and clients that may contain minimum ratings thresholds in order for Citi to hold third-party funds.

Furthermore, a credit ratings downgrade could have impacts that may not be currently known to Citi or are not possible to quantify. Some of Citi's counterparties and clients could have ratings limitations on their permissible counterparties, of which Citi may or may not be aware. Certain of Citi's corporate customers and trading counterparties, among other clients, could re-evaluate their business relationships with Citi and limit the trading of certain contracts or market instruments with Citi in response to ratings downgrades. Changes in customer and counterparty behavior could impact not only Citi's funding and liquidity but also the results of operations of certain Citi businesses. For additional information on the potential impact of a reduction in Citi's or Citibank's credit ratings, see "Managing Global Risk—Liquidity Risk" below.

COMPLIANCE RISKS

Ongoing Interpretation and Implementation of Regulatory and Legislative Requirements and Changes and Heightened Regulatory Scrutiny and Expectations in the U.S. and Globally Have Increased Citi's Compliance, Regulatory and Other Risks and Costs.

Citi is continually required to interpret and implement extensive and frequently changing regulatory and legislative requirements in the U.S. and other jurisdictions in which it does business, which may overlap or conflict across jurisdictions, resulting in substantial compliance, regulatory and other risks and costs. In addition, there are heightened regulatory scrutiny and expectations in the U.S. and globally

for large financial institutions, as well as their employees and agents, with respect to governance, infrastructure, data, climate and risk management practices and controls. These requirements and expectations also include, among other things, those related to customer and client protection, market practices, anti-money laundering and increasingly complex sanctions and disclosure regimes. A failure to comply with these requirements and expectations, even if inadvertent, or resolve any identified deficiencies, could result in increased regulatory oversight and restrictions, enforcement proceedings, penalties and fines (for additional information on such regulatory consequences, see the legal and regulatory proceedings risk factor below).

Over the past several years, Citi has been required to implement a significant number of regulatory and legislative changes, including new regulatory or legislative requirements or regimes, across its businesses and functions, and these changes continue. The changes themselves may be complex and subject to interpretation, and will require continued investments in Citi's global operations and technology solutions. In some cases, Citi's implementation of a regulatory or legislative requirement is occurring simultaneously with changing or conflicting regulatory guidance, legal challenges or legislative action to modify or repeal existing rules or enact new rules. Examples of regulatory or legislative changes that have resulted in increased compliance risks and costs include (i) various laws relating to the limitation of cross-border data movement and/or collection and use of customer information, including data localization and protection and privacy laws, which also can conflict with or increase compliance complexity with respect to other laws, including anti-money laundering laws; and (ii) the U.S. banking agencies' regulatory capital rules and requirements, which have continued to evolve (for additional information, see the capital return risk factor and "Capital Resources" above). In addition, certain U.S. regulatory agencies and non-U.S. authorities have prioritized issues of social, economic and racial justice, and are in the process of considering ways in which these issues can be mitigated, including through rulemaking, supervision and other means, even while Congress is signaling, and certain U.S. state governments are pursuing potentially conflicting anti-ESG priorities.

Citi Is Subject to Extensive Legal and Regulatory Proceedings, Examinations, Investigations, Consent Orders and Related Compliance Efforts and Other Inquiries That Could Result in Significant Monetary Penalties, Supervisory or Enforcement Orders, Business Restrictions, Limitations on Dividends, Changes to Directors and/or Officers and Collateral Consequences Arising from Such Outcomes.
At any given time, Citi is a party to a significant number of legal and regulatory proceedings and is subject to numerous governmental and regulatory examinations. Additionally, Citi remains subject to governmental and regulatory investigations, consent orders and related compliance efforts, and other inquiries. Citi could also be subject to enforcement proceedings not only because of violations of laws and regulations, but also due to failures, as determined by its regulators, to have adequate policies and procedures, or to remedy deficiencies on a timely basis.

As previously disclosed, the October 2020 FRB and OCC consent orders require Citigroup and Citibank to implement targeted action plans and submit quarterly progress reports detailing the results and status of improvements relating principally to various aspects of enterprise-wide risk management, compliance, data quality management and governance and internal controls. These improvements will result in continued significant investments by Citi during 2023 and beyond, as an essential part of Citi's broader transformation efforts to enhance its risk, controls, data and finance infrastructure and compliance.

Although there are no restrictions on Citi's ability to serve its clients, the OCC consent order requires Citibank to obtain prior approval of any significant new acquisition, including any portfolio or business acquisition, excluding ordinary course transactions. Moreover, the OCC consent order provides that the OCC has the right to assess future civil money penalties or take other supervisory and/or enforcement actions. Such actions by the OCC could include imposing business restrictions, including possible limitations on the declaration or payment of dividends and changes in directors and/or senior executive officers. More generally, the OCC and/or the FRB could take additional enforcement or other actions if the regulatory agency believes that Citi has not met regulatory expectations regarding compliance with the consent orders. For additional information regarding the consent orders, see "Citi's Consent Order Compliance" above.

The global judicial, regulatory and political environment has generally been challenging for large financial institutions, and financial institutions have been subject to continued regulatory scrutiny. The complexity of the federal and state regulatory and enforcement regimes in the U.S., coupled with the global scope of Citi's operations, also means that a single event or issue may give rise to a large number of overlapping investigations and regulatory proceedings, either by multiple federal and state agencies and authorities in the U.S. or by multiple regulators and other governmental entities in foreign jurisdictions, as well as multiple civil litigation claims in multiple jurisdictions. Violations of law by other financial institutions may also result in regulatory scrutiny of Citi. Responding to regulatory inquiries and proceedings can be time consuming and costly.

U.S. and non-U.S. regulators have been increasingly focused on the culture of financial services firms, including Citi, as well as "conduct risk," a term used to describe the risks associated with behavior by employees and agents, including third parties, that could harm clients, customers, employees or the integrity of the markets, such as improperly creating, selling, marketing or managing products and services or improper incentive compensation programs with respect thereto, failures to safeguard a party's personal information, or failures to identify and manage conflicts of interest.

In addition to the greater focus on conduct risk, the general heightened scrutiny and expectations from regulators could lead to investigations and other inquiries, as well as remediation requirements, more regulatory or other enforcement proceedings, civil litigation and higher compliance and other risks and costs. Further, while Citi takes numerous steps to prevent and detect conduct by employees and agents that could potentially harm clients, customers,

employees or the integrity of the markets, such behavior may not always be deterred or prevented. In addition to regulatory restrictions or structural changes that could result from perceived deficiencies in Citi's culture, such focus could also lead to additional regulatory proceedings. Moreover, the severity of the remedies sought in legal and regulatory proceedings to which Citi is subject has remained elevated. U.S. and certain non-U.S. governmental entities have increasingly brought criminal actions against, or have sought criminal convictions from, financial institutions and individual employees, and criminal prosecutors in the U.S. have increasingly sought and obtained criminal guilty pleas or deferred prosecution agreements against financial entities and individuals and other criminal sanctions for those institutions and individuals. These types of actions by U.S. and international governmental entities may, in the future, have significant collateral consequences for a financial institution, including loss of customers and business, and the inability to offer certain products or services and/or operate certain businesses. Citi may be required to accept or be subject to similar types of criminal remedies, consent orders, sanctions, substantial fines and penalties, remediation and other financial costs or other requirements in the future, including for matters or practices not yet known to Citi, any of which could materially and negatively affect Citi's businesses, business practices, financial condition or results of operations, require material changes in Citi's operations or cause Citi reputational harm.

Additionally, many large claims—both private civil and regulatory—asserted against Citi are highly complex, slow to develop and may involve novel or untested legal theories. The outcome of such proceedings is difficult to predict or estimate until late in the proceedings. Although Citi establishes accruals for its legal and regulatory matters according to accounting requirements, Citi's estimates of, and changes to, these accruals involve significant judgment and may be subject to significant uncertainty, and the amount of loss ultimately incurred in relation to those matters may be substantially higher than the amounts accrued (see the incorrect assumptions or estimates risk factor above). In addition, certain settlements are subject to court approval and may not be approved. For further information on Citi's legal and regulatory proceedings, see Note 29.

OTHER RISKS

Citi's Emerging Markets Presence Subjects It to Various Risks as well as Increased Compliance and Regulatory Risks and Costs.

During 2022, emerging markets revenues accounted for approximately 37% of Citi's total revenues (Citi generally defines emerging markets as countries in Latin America, Asia (other than Japan, Australia and New Zealand), and central and Eastern Europe, the Middle East and Africa in EMEA). Citi's presence in the emerging markets subjects it to various risks, such as limitations or unavailability of hedges on foreign investments; foreign currency volatility, including devaluations and continued strength in the U.S. dollar; sustained increases in interest rates; sovereign debt volatility; election outcomes, regulatory changes and political events; foreign exchange controls, including inability to access indirect foreign exchange mechanisms; macroeconomic and geopolitical challenges and uncertainties and volatility, including with respect to Russia and China (see the macroeconomic and geopolitical risk factor above and "Managing Global Risk—Other Risks—Country Risk—Russia" and "—Ukraine" below); limitations on foreign investment; sociopolitical instability (including from hyperinflation); fraud; nationalization or loss of licenses; restrictions arising from retaliatory Russian laws and regulations on the conduct of its business; sanctions or asset freezes; potential criminal charges; closure of branches or subsidiaries; and confiscation of assets, and these risks can be exacerbated in the event of a deterioration in relationships between the U.S. and an emerging market country.

For example, Citi operates in several countries that have, or have had in the past, strict capital controls, currency controls and/or sanctions, such as Argentina and Russia, that limit its ability to convert local currency into U.S. dollars and/or transfer funds outside of those countries. For instance, due to currency controls in Argentina, Citi faces a risk of devaluation on its unhedged Argentine peso-denominated assets, which continue to increase (for additional information on Argentina-related risks, see "Managing Global Risk—Other Risks—Country Risk—Argentina" below). Moreover, if the economic situation in a country in which Citi operates were to deteriorate below a certain level, U.S. regulators through the Interagency Country Exposure Review Committee (ICERC) may impose mandatory loan loss or other reserve requirements on Citi, which would increase its credit costs and decrease its earnings.

In addition, political turmoil and instability and geopolitical tensions and conflicts (such as the Russia–Ukraine war) have occurred in various regions and emerging market countries across the globe which have required, and may continue to require, management time and attention and other resources, such as monitoring the impact of sanctions on certain emerging market economies as well as impacting Citi's businesses, results of operations and financial conditions in affected countries.

The Transition Away from and Discontinuance of LIBOR or Any Other Interest Rate Benchmark Could Have Adverse Consequences for Citi.

LIBOR and other rates or indices deemed to be benchmarks have been the subject of ongoing U.S. and non-U.S. regulatory scrutiny and reform. The LIBOR administrator ceased publication of non-USD LIBOR and one-week and two-month USD LIBOR on a permanent or representative basis on December 31, 2021, with plans for all other USD LIBOR tenors to permanently cease or become non-representative after June 30, 2023. As a result, Citi ceased entering into new contracts referencing USD LIBOR as of January 1, 2022, other than for limited circumstances where regulators recognized that it may be appropriate for banks to enter into new USD LIBOR contracts, including with respect to market-making, hedging or novations of USD transactions executed before January 1, 2022.

Through a global effort by the financial services industry and regulators, alternative reference rates have been identified

and/or developed and are being used to replace LIBOR and other benchmark rates. Alternative reference rates, such as the Secured Overnight Financing Rate (SOFR), are calculated using components different from those used in the calculation of LIBOR and may fluctuate differently than, and not be representative of, LIBOR. In order to compensate for these differences, certain of Citi's financial instruments and commercial agreements allow for a benchmark replacement adjustment. However, there can be no assurance that any benchmark replacement adjustment will be sufficient to produce the economic equivalent of LIBOR, either at the benchmark replacement date or over the life of such instruments and agreements.

Moreover, the transition presents challenges related to contractual mechanics of existing contracts that reference USD LIBOR and are governed by non-U.S. law or reference the USD LIBOR Ice Swap Rate. Certain of these legacy instruments and contracts are not covered by any legislative solution and do not provide for fallbacks to alternative reference rates, which makes it unclear what the applicable future replacement benchmark rates and associated payments might be after the current benchmark's cessation. Citi may be unable to amend certain instruments and contracts due to an inability to obtain sufficient levels of consent from counterparties or security holders. Although this will depend on the precise contractual terms of the instrument, such consent requirements are often conditions of securities, such as floating rate notes. The Financial Conduct Authority (FCA), a U.K. regulator, has proposed that one-, three- and six-month USD LIBOR be published on a synthetic basis, which would only be available through September 2024.

In addition, the transition away from and discontinuance of LIBOR and other benchmark rates have subjected financial institutions, including Citi, to heightened scrutiny from regulators. Failure to successfully transition away from LIBOR and other benchmark rates could result in adverse regulatory actions, disputes, including potential litigation involving holders of outstanding products and contracts that reference LIBOR and other benchmark rates, and reputational harm to Citi. See "Managing Global Risk—Other Risks—LIBOR Transition Risk" for Citi's ongoing actions to prepare for the transition away from LIBOR.

SUSTAINABILITY AND OTHER ESG MATTERS

Introduction

Citi has worked on Environmental, Social and Governance (ESG) issues for more than 20 years and has a demonstrated record of ESG progress, including participating in the creation and adoption of ESG-related principles and standards. This section summarizes some of Citi's key ESG initiatives, including its Sustainable Progress Strategy, Net Zero, and Financial Inclusion and Racial Equity commitments.

Citi's ESG Report provides information on a broad set of ESG-related efforts. Citi's Task Force on Climate-Related Financial Disclosures (TCFD) Report provides its stakeholders with information on Citi's continued progress to manage climate risk and its Net Zero plan, including information on financed emissions and 2030 emissions targets.

For information regarding Citi's management of climate risk, see "Managing Global Risk—Strategic Risks—Climate Risk" below.

ESG and Climate-Related Governance

Citi's Board of Directors (Board) provides oversight of Citi's management activities (for additional information, see "Managing Global Risk—Risk Governance" below). For example, the Nomination, Governance and Public Affairs Committee of the Board oversees many of Citi's ESG activities, including reviewing Citi's policies and programs for environmental and social sustainability, climate change, human rights, diversity and other ESG issues, as well as overseeing engagement with external stakeholders.

The Risk Management Committee of the Board provides oversight of Citi's Independent Risk Management function and reviews Citi's risk policies and frameworks, including receiving climate risk-related updates.

The Audit Committee of the Board has recently been chartered to provide oversight of controls and procedures pertaining to the ESG-related metrics and related disclosures in Citi's SEC filed reports and voluntary ESG reporting, as well as management's evaluation of Citi's disclosure controls and procedures for ESG reporting.

Citi's Global ESG Council consists of senior members of its management team and certain subject matter experts who provide oversight of Citi's ESG goals and activities. In addition, a number of teams and senior managers contribute to the oversight and management of areas such as environmental sustainability; community investing; talent and diversity; ethics and business practices; and remuneration.

Citi's climate governance structure continues to evolve as Citi advances its understanding of its climate risk and its progress under the Net Zero plan. In addition to the expansion of the Board's oversight of climate matters (see Risk Management Committee and Audit Committee descriptions above), Citi has:

- Expanded and realigned its climate risk team to be part of the Enterprise Risk Management function within Risk;
- Further built out its Clean Energy Transition (CET) team (formed in 2021 and expanded in 2022 to include Corporate Banking), which focuses on providing advisory and capital-raising services to companies involved in energy transition; and
- Launched two climate training pilots for its BCMA (Banking, Capital Markets and Advisory), Risk Management and Global Functions teams involving in-person workshops focused on providing foundational knowledge of climate risks and client engagement.

Key ESG Initiatives

Sustainable Progress Strategy

Citi's Sustainable Progress Strategy is summarized in its Environmental and Social Policy Framework. The three pillars of the strategy each have climate-related elements and serve as the foundation for Citi's climate commitments:

- The first pillar, "Low-Carbon Transition," focuses on financing and facilitating environmental and social finance, including low-carbon solutions, and supporting Citi's clients in their decarbonization and transition strategies.
- The second pillar, "Climate Risk," focuses on Citi's efforts to measure, manage and reduce the climate risk and impact of its client portfolio. Areas of activity include portfolio analysis and stakeholder engagement as well as enhancing TCFD implementation and disclosure.
- The third pillar, "Sustainable Operations," focuses on Citi's efforts to reduce the environmental footprint of its facilities and strengthen its sustainability culture. This includes minimizing the impact of its global operations through operational footprint goals and further integrates sustainable practices across the countries in which Citi operates.

Net Zero Emissions by 2050

Citi is a member of several initiatives that enhance its understanding of climate-related issues, improve its access to data and promote a common understanding and terminology across various climate efforts. These initiatives include the Partnership for Carbon Accounting Financials, the Glasgow Financial Alliance for Net Zero and the Net Zero Banking Alliance.

As previously disclosed, Citi has committed to achieving net zero greenhouse gas (GHG) emissions associated with its financing by 2050, and net zero GHG emissions for its own operations by 2030; both are significant targets given the size and breadth of Citi's lending portfolios, businesses and operational footprint. Citi made this commitment as part of its ongoing work to reduce its climate risk and impact, grow its business in the clean energy transition and help address the challenges that climate change poses to the global economy and broader society. Citi's net zero commitment demonstrates how identifying, assessing and managing climate-related risks and opportunities remains a top business priority for Citi.

While many financial institutions, including Citi, face increasing public pressure to divest from carbon-intensive sectors, Citi believes it has an important role to play in advising and financing the transition to net zero, and it plans to work closely with clients in this effort. Citi recognizes that large-scale, rapid divestment could result in an abrupt and disorderly transition to a low-carbon economy, creating both economic and social upheaval. Citi believes that an orderly, responsible and equitable transition, which accounts for the immediate economic needs of communities and workers, continued access to energy, environmental justice considerations and broader economic development concerns, is essential for the retention of political and social support to move to a low-carbon economy.

The 2050 net zero commitment includes the following framework, delineating the key areas required to achieve its targets:

- Calculate Emissions: Calculate baseline financed emissions for each carbon-intensive sector
- Transition Pathway: Identify the appropriate climate scenario transition pathway
- Target Setting: Establish emissions reduction targets for 2030 and beyond
- Implementation Strategy: Engage with and assess clients to determine transition opportunities
- External Engagement: Solicit feedback from clients, investors and other stakeholders, as the work continues to evolve and the parties collectively define net zero for the banking sector

Citi's Net Zero plan includes:

- *Net Zero Metrics and Target Setting*: Assess targets for carbon-intensive sectors and explore methodologies for calculating financed emissions beyond lending portfolios
- *Client Engagement and Assessment*: Seek to understand clients' GHG emissions and work with them to develop their transition plans and advise on capacity building
- *Risk Management*: Assess climate risk exposure across Citi's lending portfolios and review client carbon reduction progress, with ongoing review and refining of Citi's risk appetite and thresholds and policies related to Climate Risk Management
- *Clean Technology and Transition Finance*: Support existing and, where possible, new technologies to accelerate commercialization and provide transition advisory and finance, via debt and equity underwriting
- *Portfolio Management*: Active portfolio management to align with net zero targets, including considerations of transition measures taken by clients
- *Public Policy and Regulatory Engagement*: Support enabling public policy and regulation in the U.S. and other countries where relevant

In 2022, Citi took the following steps to operationalize its Net Zero plan:

- In addition to the energy and power targets established last year, Citi has set 2030 emissions reduction targets for four additional loan portfolio sectors: automotive manufacturing, commercial real estate, steel and thermal coal mining.
- Citi has begun piloting a Net Zero Review Template for its energy and power clients to better understand their transition plans.
- Citi worked with RMI to help develop and launch the Sustainable STEEL Principles, a solution for measuring and disclosing the alignment of steel lending portfolios with 1.5°C climate targets.

Financial Inclusion and Racial Equity

Building on Citi's longstanding focus on advancing financial inclusion and economic opportunity for communities of color, in September 2020, Citi and the Citi Foundation announced Action for Racial Equity (ARE), a set of strategic initiatives to help close the racial wealth gap and increase economic mobility in the U.S. As part of ARE, Citi and the Citi Foundation have invested more than $1 billion in strategic initiatives to provide greater access to banking and credit in communities of color, increase investment in Black-owned businesses, expand access to affordable housing and

homeownership among Black Americans and advance anti-racist practices within Citi and across the financial services industry.

Consistent with its commitment to transparently report on ARE, in December 2022 Citi released the results of a racial equity audit of ARE, which it had commissioned from the law firm Covington & Burling. The audit assessed ARE as an effort to help address various drivers of the racial wealth gap by evaluating ARE's design, implementation and extent of integration into Citi's business. The audit's overall assessment was that ARE was a well-designed and credible effort to help address the racial wealth gap in the U.S., given the dimensions of Citi's business. More specifically, it concluded that:

- ARE's design effectively leveraged Citi's expertise, network of business partners and resources to address some of the key factors contributing to the racial wealth gap.
- Citi has made progress toward many of the objectives committed to under ARE, although at the time of the audit (the end of the first two years of its three-year commitment) it had not yet accomplished every objective or commitment.
- There are opportunities to further institutionalize ARE efforts into Citi's core business, building upon the creation of dedicated business units in both *PBWM* and *ICG*.
- There are opportunities for Citi to further support consumers from underrepresented communities to build and maintain healthy credit scores and access credit.

In addition to Citi's ongoing work and focus on ARE and in line with its continued commitment to expand access to banking products and services that can help advance economic progress—especially for underbanked and unbanked communities—Citi eliminated overdraft fees, returned item fees and overdraft protection fees beginning in June 2022. In addition to eliminating these fees, Citi will continue to offer a robust suite of free overdraft protection services for its customers.

Additional Information

For additional information on Citi's environmental and social policies and priorities, click on "Our Impact" on Citi's website at www.citigroup.com. For information on Citi's ESG and Sustainability (including climate change) governance, see Citi's 2023 Annual Meeting Proxy Statement to be filed with the SEC in March 2023, as well as its 2022 TCFD Report to be published and available on Citi's investor relations website in March 2023.

The 2022 TCFD Report and any other ESG-related reports and information included elsewhere on Citi's investor relations website are not incorporated by reference into, and do not form any part of, this 2022 Annual Report on Form 10-K.

HUMAN CAPITAL RESOURCES AND MANAGEMENT

Attracting and retaining a highly qualified and motivated workforce is a strategic priority for Citi. Citi seeks to enhance the competitive strength of its workforce through the following efforts:

- Continuously innovating the recruitment, training, compensation, promotion and engagement of colleagues
- Actively seeking and listening to diverse perspectives at all levels of the organization
- Optimizing transparency concerning workforce goals to promote accountability, credibility and effectiveness in achieving those goals
- Providing compensation programs that are competitive in the market and aligned to strategic objectives

Workforce Size and Distribution

As of December 31, 2022, Citi employed approximately 240,000 colleagues in over 90 countries. The Company's workforce is constantly evolving and developing, benefiting from a strong mix of internal and external hiring into new and existing positions. In 2022, Citi welcomed nearly 60,000 new colleagues in addition to the roles filled by colleagues through internal mobility. The following table shows the geographic distribution of Citi's employee population by segment, region and gender:

Segment or component[1]	North America	EMEA	Latin America	Asia	Total[2]	Women[3]	Men[3]	Unspecified[3]
Institutional Clients Group	19,162	19,635	7,569	27,882	74,248	44.1 %	55.9 %	0.03 %
Personal Banking and Wealth Management	39,952	2,227	452	14,084	56,715	56.8	43.2	0.02
Legacy Franchises	58	21	35,776	14,392	50,247	55.1	44.9	—
Corporate/Other	27,690	10,894	7,281	12,828	58,693	46.8	53.2	0.02
Total	86,862	32,777	51,078	69,186	239,903	50.1 %	49.9 %	0.02 %

(1) Colleague distribution is based on assigned business and region, which may not reflect where the colleague physically resides.
(2) Part-time colleagues represented less than 1.5% of Citi's global workforce.
(3) Information regarding gender is self-identified by colleagues.

Driving a Culture of Excellence and Accountability

Citi continues to embark on a talent and culture transformation to drive a culture of excellence and accountability that is supported by strong risk and controls management.

Citi's new Leadership Principles of "taking ownership, delivering with pride and succeeding together" have been reinforced through a behavioral science-led campaign, Citi's New Way, that reinforces the key working habits that support Citi's leadership culture.

Citi's performance management approach also emphasizes the Leadership Principles through a new four-pillar system, evaluating what colleagues deliver against financial performance, risk and controls, and client and franchise goals as well as how colleagues deliver from a leadership perspective. The performance management and incentive compensation processes and associated policies and frameworks have been redesigned to enhance accountability through increased rigor and consistency, in particular for risk and controls.

The culture shift is also being supported by changes in the way Citi identifies, assesses, develops and promotes talent, particularly at the most senior levels of the organization. In 2022, the first Company-wide approach for promotions to the critical leadership role of Managing Director was launched, with common eligibility criteria across Citi, including risk and control performance. Further, all potential successors to Executive Management Team roles are evaluated by the Board and are now subject to a risk and controls assessment.

Diversity, Equity and Inclusion

Citigroup's Board is committed to ensuring that the Board and Citi's Executive Management Team are composed of individuals whose backgrounds reflect the diversity of Citi's employees, customers and other stakeholders. In addition, Citi has increased its efforts to diversify its workforce, including, among other things, taking actions with respect to pay equity, setting representation goals and the use of diverse slates in recruiting.

Pay Transparency and Pay Equity

Citi values pay transparency and has taken significant action to ensure that both managers and employees have greater clarity around Citi's compensation philosophy. Over the past two years, Citi introduced market-based salary structures and bonus opportunity guidelines in various countries worldwide. In addition, Citi recently began posting salary ranges on all

external U.S. job postings, which aligns with strategic objectives of pay equity and transparency. Citi also raised its U.S. minimum wage in 2022, the second broad-based increase in less than two years.

Citi has focused on measuring and addressing pay equity within the organization:

- In 2018, Citi was the first major U.S. financial institution to publicly release the results of a pay equity review comparing its compensation of women to that of men, as well as U.S. minorities to U.S. non-minorities. Since 2018, Citi has continued to be transparent about pay equity, including disclosing its unadjusted or "raw" pay gap for both women and U.S. minorities. The raw gap measures the difference in median compensation. The existence of Citi's raw pay gap reflects a need to increase representation of women and U.S. minorities in senior and higher-paying roles.
- Citi's 2022 pay equity review determined that on an adjusted basis, women globally are paid on average more than 99% of what men are paid at Citi, and that there was not a statistically significant difference in adjusted compensation for U.S. minorities and non-minorities.
- Citi's 2022 raw pay gap analysis showed that the median pay for women globally is 78% of the median for men, up from 74% in 2021 and 2020. The median pay for U.S. minorities is more than 97% of the median for non-minorities, which is up from just above 96% in 2021 and 94% in 2020.

Representation Goals

Citi's management believes that a diverse workforce is key to the Company's success in serving diverse clients and communities. In 2022, Citi announced that it exceeded its Company-wide, aspirational diversity representation goals for 2018–2021 to increase its percentages of women colleagues globally and Black talent in the U.S.

Recognizing that this was just a starting point, Citi has set new goals for 2025. The new goals are more global, embrace more dimensions of diversity and include all levels of the Company.

Citi's 2025 aspirational representation goals are embedded in its business strategy. Citi has goals for hiring and promoting colleagues into roles at the Assistant Vice President to Managing Director levels across the organization, as well as goals for campus hiring from colleges and universities. Having aspirational goals across all levels—from early career through senior leadership roles—will help ensure Citi not only has diverse talent in leadership roles, but will also help the Company build a diverse talent pipeline for the future.

Workforce Development

Citi's numerous programmatic offerings aim to reinforce its culture and values, foster understanding of compliance requirements and develop competencies required to deliver excellence to its clients. Citi encourages career growth and development by offering broad and diverse opportunities to colleagues, including the following:

- Citi provides a range of internal development and rotational programs to colleagues at all levels, including an extensive leadership curriculum, allowing the opportunity to build the skills needed to transition to supervisory and managerial roles. Citi's tuition assistance program further enables colleagues in North America to pursue their educational goals.
- Citi has a focus on internal talent development and aims to provide colleagues with career growth opportunities, with more than 33,000 open positions filled internally in 2022. These opportunities are particularly important as Citi focuses on providing career paths for its internal talent base as part of its efforts to increase organic growth and promotions within the organization.

Wellness and Benefits

Citi is proud to provide a wide range of benefits that support its colleagues mentally, emotionally, physically and financially and through various life stages and events. The Company is focused on providing equitable benefits that are designed to attract, engage and retain colleagues.

Citi has significantly enhanced mental well-being programs by offering free counseling sessions for colleagues and their family members and adding real-time text, video and message-based counseling in the U.S., as well as offering an online tool so that all colleagues around the globe can easily find their local Employee Assistance Programs and resources. Citi also continues to value the importance of physical well-being—providing employees in several office locations and countries access to onsite medical care clinics, fitness centers, subsidized gym memberships and virtual fitness programs.

Citi continues expanding employee benefits to support colleagues and their families. In early 2020, Citi expanded its Paid Parental Leave Policy to include Citi colleagues around the world. Citi also began to offer additional leave opportunities to eligible colleagues, including the "Refresh, Recharge, Reenergize" program, whereby employees are able to take up to 12 weeks for a sabbatical to pursue a personal interest, and the "Giving Back" program, allowing employees to take up to four weeks to work with a charitable institution.

In 2022, Citi implemented a global, flexible work approach to provide colleagues with the ability to balance the demands of their home lives with the work conditions that are necessary for success. The "How We Work" approach includes a new work model for Citi, defined by three role designations for colleagues globally: Resident, Hybrid or Remote. By embracing a flexible model of work, Citi has focused on keeping its approach consistent and aligned with its values and priorities.

For additional information about Citi's human capital management initiatives and goals, see Citi's 2021 ESG report available at www.citigroup.com. The 2021 ESG report and other information included elsewhere on Citi's investor relations website are not incorporated by reference into, and do not form any part of, this 2022 Annual Report on Form 10-K.

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(1) For additional information regarding certain credit risk, market risk and other quantitative and qualitative information, refer to Citi's Pillar 3 Basel III Advanced Approaches Disclosures, as required by the rules of the Federal Reserve Board, on Citi's Investor Relations website.

MANAGING GLOBAL RISK

Overview

For Citi, effective risk management is of primary importance to its overall operations. Accordingly, Citi has established an Enterprise Risk Management (ERM) Framework to ensure that all of Citi's risks are managed appropriately and consistently across the Company and at an aggregate, enterprise-wide level. Citi's culture drives a strong risk and control environment, and is at the heart of the ERM Framework, underpinning the way Citi conducts business. The activities that Citi engages in, and the risks those activities generate, must be consistent with Citi's Mission and Value Proposition and the key Leadership Principles that support it, as well as Citi's risk appetite. As discussed above, Citi also continues its efforts to comply with the FRB and OCC consent orders, relating principally to various aspects of risk management, compliance, data quality management and governance, and internal controls (see "Citi's Consent Order Compliance" and "Risk Factors—Compliance Risks" above).

Under Citi's Mission and Value Proposition, which was developed by its senior leadership and distributed throughout the Company, Citi strives to serve its clients as a trusted partner by responsibly providing financial services that enable growth and economic progress while earning and maintaining the public's trust by constantly adhering to the highest ethical standards. As such, Citi asks all colleagues to ensure that their decisions pass three tests: they are in Citi's clients' best interests, create economic value and are always systemically responsible.

As discussed in "Human Capital Resources and Management" above, Citi has designed Leadership Principles that represent the qualities, behaviors and expectations all employees must exhibit to deliver on Citi's mission of enabling growth and economic progress. The Leadership Principles inform Citi's ERM Framework and will contribute to creating a culture that drives client, control and operational excellence. Citi colleagues share a common responsibility to uphold these leadership principles and hold themselves to the highest standards of ethics and professional behavior in dealing with Citi's clients, business colleagues, shareholders, communities and each other.

Citi's ERM Framework details the principles used to support effective enterprise-wide risk management across the end-to-end risk management lifecycle. The ERM Framework covers the risk management roles and responsibilities of the Citigroup Board of Directors (the Board), Citi's Executive Management Team (see "Risk Governance—Executive Management Team" below) and employees across the lines of defense. The underlying pillars of the framework encompass:

- *Culture*—the core principles and behaviors that underpin a strong culture of risk awareness, in line with Citi's Mission and Value Proposition, and Leadership Principles;
- *Governance*—the committee structure and reporting arrangements that support the appropriate oversight of risk management activities at the Board and Executive Management Team levels;
- *Risk Management*—the end-to-end risk management cycle including the identification, measurement, monitoring, controlling and reporting of all risks including top, material, growing, idiosyncratic and emerging risks, and aggregated to an enterprise-wide level; and
- *Enterprise Programs*—the key risk management programs performed across the risk management lifecycle for all risk categories; these programs also outline the specific roles played by each of the lines of defense in these processes.

Each of these pillars is underpinned by supporting capabilities, which are the infrastructure, people, technology and data, and modelling and analytical capabilities that are in place to enable the execution of the ERM Framework.

Citi's approach to risk management requires that its risk-taking be consistent with its risk appetite. The risk appetite is the aggregate level and types of risk Citi is willing to take or tolerate in order to meet its strategic objectives and business plan. Citi's risk appetite framework is the overall firm-wide approach, including policies, processes, controls and systems through which the risk appetite is established, communicated and monitored. In addition, underlying risk limits and thresholds are designed to control concentrations and operationalize risk appetite.

Citi's risks are generally categorized and summarized as follows:

- *Credit risk* is the risk of loss resulting from the decline in credit quality (or downgrade risk) or failure of a borrower, counterparty, third party or issuer to honor its financial or contractual obligations.
- *Liquidity risk* is the risk that Citi will not be able to efficiently meet both expected and unexpected current and future cash flow and collateral needs without adversely affecting either daily operations or financial conditions of Citi.
- *Market risk (Trading and Non-Trading)*: Market risk of trading portfolios is the risk of loss arising from changes in the value of Citi's assets and liabilities resulting from changes in market variables, such as interest rates, exchange rates, equity and commodity prices or credit spreads. Market risk of non-trading portfolios is the risk to current or projected financial condition and resilience arising from movements in interest rates resulting from repricing risk, basis risk, yield curve risk and options risk.
- *Operational risk* is the risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events. It includes legal risk, which is the risk of loss (including litigation costs, settlements and regulatory fines) resulting from Citi's failure to comply with laws, regulations, prudent ethical standards or contractual obligations in any aspect of Citi's business, but excludes strategic and reputation risks (see below).
- *Compliance risk* is the risk to current or projected financial condition and resilience arising from violations of laws, rules or regulations, or from non-conformance

with prescribed practices, internal policies and procedures or ethical standards.

- *Reputation risk* is the risk to current or projected financial conditions and resilience from negative opinion held by stakeholders.
- *Strategic risk* is the risk of a sustained impact (not episodic impact) to Citi's core strategic objectives as measured by impacts on anticipated earnings, market capitalization or capital, arising from the external factors affecting the Company's operating environment; as well as the risks associated with defining the strategy and executing the strategy, which are identified, measured and managed as part of the Strategic Risk Framework at the Enterprise Level.

Citi uses a lines of defense model as a key component of its ERM Framework to manage its risks. As discussed below, the lines of defense model brings together risk-taking, risk oversight and risk assurance under one umbrella and provides an avenue for risk accountability of first line of defense, a construct for effective challenge by the second line of defense (Independent Risk Management and Independent Compliance Risk Management), and empowers independent risk assurance by the third line of defense (Internal Audit). In addition, the lines of defense model includes organizational units tasked with supporting a strong control environment ("enterprise support functions"). The first, second and third lines of defense, along with enterprise support functions, have distinct roles and responsibilities and are empowered to perform relevant risk management processes and responsibilities in order to manage Citi's risks in a consistent and effective manner.

First Line of Defense: Front Line Units and Front Line Unit Activities

Citi's first line of defense owns the risks and associated controls inherent in, or arising from, the execution of its business activities and is responsible for identifying, measuring, monitoring, controlling and reporting those risks consistent with Citi's strategy, Mission and Value Proposition, Leadership Principles and risk appetite.

Front line units are responsible and held accountable for managing the risks associated with their activities within the boundaries set by independent risk management. They are also responsible for designing and implementing effective internal controls and maintaining processes for managing their risk profile, including through risk mitigation, so that it remains consistent with Citi's established risk appetite.

Front line unit activities are considered part of the first line of defense and are subject to the oversight and challenge of independent risk management.

The first line of defense is composed of Citi's Business Management, Regional Management, certain Corporate Functions (Enterprise Operations and Technology, Chief Administrative Office, Global Public Affairs, Office of the Citibank Chief Executive Officer (CEO) and Finance), as well as other front line unit activities. Front line units may also include enterprise support units and/or conduct enterprise support activities—see "Enterprise Support Functions" below.

Second Line of Defense: Independent Risk Management

Independent risk management units are independent of the first line of defense. They are responsible for overseeing the risk-taking activities of the first line of defense and challenging the first line of defense in the execution of its risk management responsibilities. They are also responsible for independently identifying, measuring, monitoring, controlling and reporting aggregate risks and for setting standards for the management and oversight of risk. Independent risk management is composed of Independent Risk Management (IRM) and Independent Compliance Risk Management (ICRM), which are led by the Group Chief Risk Officer (CRO) and Group Chief Compliance Officer (CCO) who have unrestricted access to the Board and its Risk Management Committee to facilitate the ability to execute their specific responsibilities pertaining to escalation to the Board.

Independent Risk Management

The IRM organization sets risk and control standards for the first line of defense and actively manages and oversees aggregate credit, market (trading and non-trading), liquidity, strategic, operational and reputation risks across Citi, including risks that span categories, such as concentration risk, country risk and climate risk.

IRM is organized to align to risk categories, legal entities/ regions and Company-wide, cross-risk functions or processes. Each of these units reports to a member of the Risk Management Executive Council, who are all direct reports to the Citigroup CRO.

Independent Compliance Risk Management

The ICRM organization actively oversees compliance risk across Citi, sets compliance risk and control standards for the first line of defense to manage compliance risk and promotes business conduct and activity that is consistent with Citi's Mission and Value Proposition and the compliance risk appetite. Citi's objective is to embed an enterprise-wide compliance risk management framework and culture that identifies, measures, monitors, controls and escalates compliance risk across Citi.

ICRM is aligned by product line, function and geography to provide compliance risk management advice and credible challenge on day-to-day matters and strategic decision-making for key initiatives. ICRM also has program-level Enterprise Compliance units responsible for setting standards and establishing priorities for program-related compliance efforts. These Compliance Risk Management heads report directly to the CCO. The CCO reports to Citi's General Counsel and ICRM is organizationally part of the Global Legal Affairs & Compliance group. In addition, the CCO has matrix reporting into the CRO and is part of the Risk Management Executive Council.

Third Line of Defense: Internal Audit

Internal Audit is independent of the first line, second line and enterprise support functions. The role of Internal Audit is to provide independent, objective, reliable, valued and timely assurance to the Board, its Audit Committee, Citi senior management and regulators over the effectiveness of governance, risk management and controls that mitigate

current and evolving risks and enhance the control culture within Citi. The Citi Chief Auditor manages Internal Audit and reports functionally to the Chairman of the Citi Audit Committee and administratively to the Citi Chief Executive Officer. The Citi Chief Auditor has unrestricted access to the Board and the Board Audit Committee to address risks and issues identified through Internal Audit's activities.

Enterprise Support Functions

Enterprise support functions engage in activities that support safety and soundness across Citi. These functions provide advisory services and/or design, implement, maintain and oversee Company-wide programs that support Citi in maintaining an effective control environment.

Enterprise support functions are composed of Human Resources and Legal (including Citi Security and Investigative Services). Front line units may also include enterprise support units and/or conduct enterprise support activities (e.g., the Controllers Group within Finance).

Enterprise support functions, units and activities are subject to the relevant Company-wide independent oversight processes specific to the risks for which they are accountable (e.g., operational risk, compliance risk, reputation risk).

Risk Governance

Citi's ERM Framework encompasses risk management processes to address risks undertaken by Citi through identification, measurement, monitoring, controlling and reporting of all risks. The ERM Framework integrates these processes with appropriate governance to complement Citi's commitment to maintaining strong and consistent risk management practices.

Board Oversight

The Board is responsible for oversight of Citi and holds the Executive Management Team accountable for implementing the ERM Framework, meeting strategic objectives within Citi's risk appetite.

Executive Management Team

The Board delegates authority to an Executive Management Team for directing and overseeing day-to-day management of Citi. The Executive Management Team is led by the Citigroup CEO and provides oversight of group activities, both directly and through authority delegated to committees it has established to oversee the management of risk, to ensure continued alignment with Citi's risk strategy.

Board and Executive Management Committees

The Board executes its responsibilities either directly or through its committees. The Board has delegated authority to the following Board standing committees to help fulfill its oversight and risk management responsibilities:

- *Risk Management Committee (RMC)*: assists the Board in fulfilling its responsibility with respect to (i) oversight of Citi's risk management framework, including the significant policies and practices used in managing credit, market, liquidity, strategic, operational, compliance, reputation and certain other risks, including those pertaining to capital management, and (ii) performance oversight of the Global Risk Review—credit, capital and collateral review functions.
- *Audit Committee*: provides oversight of Citi's financial reporting and internal control risk, as well as Internal Audit and Citi's external independent accountants.
- *Compensation, Performance Management and Culture Committee*: provides oversight of compensation of Citi's employees and Citi management's sustained focus on fostering a principled culture of sound ethics, responsible conduct and accountability within the organization.
- *Nomination, Governance and Public Affairs Committee*: provides oversight of reputational issues, Environmental, Social and Governance (ESG) and sustainability matters, and legal and regulatory compliance risks as they relate to corporate governance matters.
- *Technology Committee*: assists the Board in fulfilling its responsibility with respect to oversight of (i) Citigroup's technology strategy and operating plan and the development of Citi's target operating model and architecture, (ii) technology-based risk management, including Cyber Security, (iii) technology-related resource and talent planning and (iv) third-party management policies, practices and standards.

In addition to the above, the Board has established the following ad hoc committee:

- *Transformation Oversight Committee*: provides oversight of the actions of Citi's management to develop and execute a transformation of Citi's risk and control environment pursuant to the recent regulatory consent orders (for additional information see "Citi's Consent Order Compliance" above).

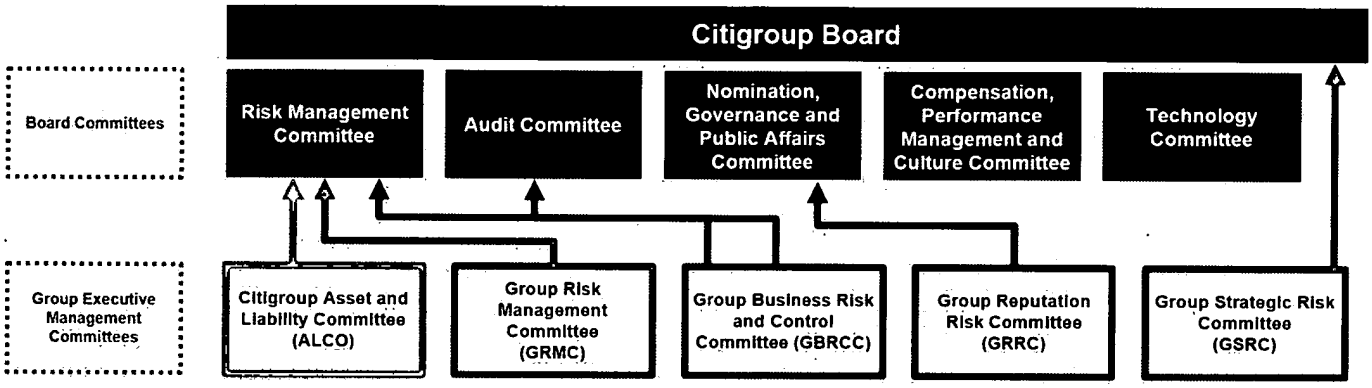
The Executive Management Team has established five standing committees that cover the primary risks to which Citi (i.e., Group) is exposed. These consist of:

- *Group Strategic Risk Committee (GSRC)*: provides governance oversight of Citi's management actions to adequately identify, monitor, report, manage and escalate all material strategic risks facing Citi.
- *Citigroup Asset and Liability Committee (ALCO)*: responsible for governance over management's Liquidity Risk and Market Risk (non-trading) management and for monitoring and influencing the balance sheet, investment securities and capital management activities of Citigroup.
- *Group Risk Management Committee (GRMC)*: the primary senior executive level committee responsible for (i) overseeing the execution of Citigroup's ERM Framework, (ii) monitoring Citi's risk profile at an aggregate level inclusive of individual risk categories, (iii) ensuring that Citi's risk profile remains consistent with its approved risk appetite and (iv) discussing material and emerging risk issues facing the Company. The Committee also provides comprehensive Group-wide coverage of all risk categories, including Credit Risk and Market Risk (trading).
- *Group Business Risk and Control Committee (GBRCC)*: provides governance oversight of Citi's Compliance and Operational Risks.

- *Group Reputation Risk Committee (GRRC)*: provides governance oversight for Reputation Risk management across Citi.

In addition to the Executive Management committees listed above, management may establish ad-hoc committees in response to regulatory feedback or to manage additional activities when deemed necessary.

The figure below illustrates the reporting lines between the Board and Executive Management committees:



CREDIT RISK

Overview

Credit risk is the risk of loss resulting from the decline in credit quality of a client, customer or counterparty (or downgrade risk) or the failure of a borrower, counterparty, third party or issuer to honor its financial or contractual obligations. Credit risk is one of the most significant risks Citi faces as an institution. For additional information, see "Risk Factors—Credit Risk" above. Credit risk arises in many of Citigroup's business activities, including:

- consumer, commercial and corporate lending;
- capital markets derivative transactions;
- structured finance; and
- securities financing transactions (repurchase and reverse repurchase agreements, and securities loaned and borrowed).

Credit risk also arises from clearing and settlement activities, when Citi transfers an asset in advance of receiving its counter-value or advances funds to settle a transaction on behalf of a client. Concentration risk, within credit risk, is the risk associated with having credit exposure concentrated within a specific client, industry, region or other category.

Citi has an established framework in place for managing credit risk across all businesses that includes a defined risk appetite, credit limits and credit policies. Citi's credit risk management framework also includes policies and procedures to manage problem exposures.

To manage concentration risk, Citi has in place a framework consisting of industry limits, single-name concentrations for each business and across Citigroup and a specialized product limit framework.

Credit exposures are generally reported in notional terms for accrual loans, reflecting the value at which the loans as well as other off-balance sheet commitments are carried on the Consolidated Balance Sheet. Credit exposure arising from capital markets activities is generally expressed as the current mark-to-market, net of margin, reflecting the net value owed to Citi by a given counterparty.

The credit risk associated with Citi's credit exposures is a function of the idiosyncratic creditworthiness of the obligor, as well as the terms and conditions of the specific obligation. Citi assesses the credit risk associated with its credit exposures on a regular basis through its allowance for credit losses (ACL) process (see "Significant Accounting Policies and Significant Estimates—Allowance for Credit Losses" below and Notes 1 and 15), as well as through regular stress testing at the company, business, geography and product levels. These stress-testing processes typically estimate potential incremental credit costs that would occur as a result of either downgrades in the credit quality or defaults of the obligors or counterparties. See Note 14 for additional information on Citi's credit risk management.

CORPORATE CREDIT

Consistent with its overall strategy, Citi's corporate clients are typically corporations that value the depth and breadth of Citi's global network. Citi aims to establish relationships with these clients whose needs encompass multiple products, including cash management and trade services, foreign exchange, lending, capital markets and M&A advisory.

Corporate Credit Portfolio

The following table details Citi's corporate credit portfolio within *ICG* and the Mexico SBMM component of *Legacy Franchises* (excluding certain loans managed on a delinquency basis, loans carried at fair value and loans held-for-sale), and before consideration of collateral or hedges, by remaining tenor for the periods indicated:

	December 31, 2022				September 30, 2022				December 31, 2021			
In billions of dollars	Due within 1 year	Greater than 1 year but within 5 years	Greater than 5 years	Total exposure	Due within 1 year	Greater than 1 year but within 5 years	Greater than 5 years	Total exposure	Due within 1 year	Greater than 1 year but within 5 years	Greater than 5 years	Total exposure
Direct outstandings (on-balance sheet)[1]	$ 134	$ 122	$ 27	$ 283	$ 143	$ 114	$ 27	$ 284	$ 145	$ 119	$ 20	$ 284
Unfunded lending commitments (off-balance sheet)[2]	140	256	10	406	133	248	10	391	147	269	13	429
Total exposure	$ 274	$ 378	$ 37	$ 689	$ 276	$ 362	$ 37	$ 675	$ 292	$ 388	$ 33	$ 713

(1) Includes drawn loans, overdrafts, bankers' acceptances and leases.
(2) Includes unused commitments to lend, letters of credit and financial guarantees.

Portfolio Mix—Geography and Counterparty

Citi's corporate credit portfolio is diverse across geography and counterparty. The following table shows the percentage of this portfolio by region based on Citi's internal management geography:

	December 31, 2022	September 30, 2022	December 31, 2021
North America	56 %	56 %	56 %
EMEA	25	25	25
Asia	12	12	13
Latin America	7	7	6
Total	100 %	100 %	100 %

The maintenance of accurate and consistent risk ratings across the corporate credit portfolio facilitates the comparison of credit exposure across all lines of business, geographic regions and products. Counterparty risk ratings reflect an estimated probability of default for a counterparty, and internal risk ratings are derived by leveraging validated statistical models and scorecards in combination with consideration of factors specific to the obligor or market, such as management experience, competitive position, regulatory environment and commodity prices. Facility risk ratings are assigned that reflect the probability of default of the obligor and factors that affect the loss given default of the facility, such as support or collateral. Internal obligor ratings that generally correspond to BBB and above are considered investment grade, while those below are considered non-investment grade.

The following table presents the corporate credit portfolio by facility risk rating as a percentage of the total corporate credit portfolio:

	Total exposure		
	December 31, 2022	September 30, 2022	December 31, 2021
AAA/AA/A	50 %	50 %	48 %
BBB	34	33	34
BB/B	14	15	16
CCC or below	2	2	2
Total	100 %	100 %	100 %

Note: Total exposure includes direct outstandings and unfunded lending commitments.

In addition to the obligor and facility risk ratings assigned to all exposures, Citi may classify exposures in the corporate credit portfolio. These classifications are consistent with Citi's interpretation of the U.S. banking regulators' definition of criticized exposures, which may categorize exposures as special mention, substandard, doubtful or loss.

Risk ratings and classifications are reviewed regularly and adjusted as appropriate. The credit review process incorporates quantitative and qualitative factors, including financial and non-financial disclosures or metrics, idiosyncratic events or changes to the competitive, regulatory or macroeconomic environment. This includes but is not limited to exposures in those sectors significantly impacted by the COVID-19

pandemic (including consumer retail, commercial real estate and transportation).

Citi believes the corporate credit portfolio to be appropriately rated and classified as of December 31, 2022. Citigroup has taken action to adjust internal ratings and classifications of exposures as both the macroeconomic environment and obligor-specific factors have changed, particularly where additional stress has been seen.

As obligor risk ratings are downgraded, the probability of default increases. Downgrades of obligor risk ratings tend to result in a higher provision for credit losses. In addition, downgrades may result in the purchase of additional credit derivatives or other risk mitigants to hedge the incremental credit risk, or may result in Citi's seeking to reduce exposure to an obligor or an industry sector. Citi will continue to review exposures to ensure that the appropriate probability of default is incorporated into all risk assessments.

See Note 14 for additional information on Citi's corporate credit portfolio.

Portfolio Mix—Industry

Citi's corporate credit portfolio is diversified by industry. The following table details the allocation of Citi's total corporate credit portfolio by industry:

	Total exposure		
	December 31, 2022	September 30, 2022	December 31, 2021
Transportation and industrials	**20 %**	20 %	20 %
Technology, media and telecom	**12**	12	12
Consumer retail	**11**	11	11
Real estate	**10**	10	10
Power, chemicals, metals and mining	**9**	9	9
Banks and finance companies[1]	**10**	9	8
Energy and commodities	**7**	7	7
Asset managers and funds	**5**	7	8
Health	**6**	5	5
Insurance	**4**	4	4
Public sector	**3**	3	3
Financial markets infrastructure	**2**	2	2
Other industries	**1**	1	1
Total	**100 %**	100 %	100 %

(1) As of the periods in the table, Citi had less than 1% exposure to securities firms. See corporate credit portfolio by industry, below.

The following table details Citi's corporate credit portfolio by industry as of December 31, 2022:

					Non-investment grade			Selected metrics		
In millions of dollars	Total credit exposure	Funded[1]	Unfunded[1]	Investment grade	Non-criticized	Criticized performing	Criticized non-performing[2]	30 days or more past due and accruing	Net credit losses (recoveries)	Credit derivative hedges[3]
Transportation and industrials	$ 139,225	$ 57,271	$ 81,954	$ 109,197	$ 19,697	$ 9,850	$ 481	$ 403	$ —	$ (8,459)
Autos[4]	47,482	21,995	25,487	40,795	5,171	1,391	125	52	—	(3,084)
Transportation	24,843	10,374	14,469	18,078	3,156	3,444	165	57	(30)	(1,270)
Industrials	66,900	24,902	41,998	50,324	11,370	5,015	191	294	30	(4,105)
Technology, media and telecom	81,211	28,931	52,280	65,386	12,308	3,308	209	169	11	(6,050)
Consumer retail	78,255	32,687	45,568	60,215	14,830	2,910	300	195	28	(5,395)
Real estate	70,676	48,539	22,137	63,023	4,722	2,881	50	138	2	(739)
Power, chemicals, metals and mining	59,404	18,326	41,078	47,395	10,466	1,437	106	226	34	(5,063)
Power	22,718	4,827	17,891	18,822	3,325	512	59	129	(3)	(2,306)
Chemicals	23,147	7,765	15,382	19,033	3,534	564	16	55	30	(2,098)
Metals and mining	13,539	5,734	7,805	9,540	3,607	361	31	42	7	(659)
Banks and finance companies	65,623	42,276	23,347	57,368	5,718	2,387	150	266	65	(1,113)
Energy and commodities[5]	46,309	13,069	33,240	38,918	6,076	1,200	115	180	11	(3,852)
Asset managers and funds	35,983	13,162	22,821	34,431	1,492	60	—	95	—	(759)
Health	41,836	8,771	33,065	36,954	3,737	978	167	84	7	(2,855)
Insurance	29,932	4,417	25,515	29,090	801	41	—	44	—	(3,884)
Public sector	23,705	11,736	11,969	20,663	2,084	956	2	77	4	(1,633)
Financial markets infrastructure	8,742	60	8,682	8,672	70	—	—	—	—	(18)
Securities firms	1,462	569	893	625	678	157	2	2	—	(2)
Other industries	6,697	3,651	3,046	4,842	1,568	238	49	19	16	(8)
Total	$ 689,060	$ 283,465	$ 405,595	$ 576,779	$ 84,247	$ 26,403	$ 1,631	$ 1,898	$ 178	$ (39,830)

(1) Excludes $0.6 billion and $0.1 billion of funded and unfunded exposure at December 31, 2022, respectively, primarily related to the delinquency-managed loans and unearned income. Funded balances also exclude loans carried at fair value of $5.1 billion at December 31, 2022.

(2) Includes non-accrual loan exposures and criticized unfunded exposures.

(3) Represents the amount of purchased credit protection in the form of derivatives to economically hedge funded and unfunded exposures. Of the $39.8 billion of purchased credit protection, $36.6 billion represents the total notional amount of purchased credit derivatives on individual reference entities. The remaining $3.2 billion represents the first loss tranche of portfolios of purchased credit derivatives with a total notional of $27.6 billion, where the protection seller absorbs the first loss on the referenced loan portfolios.

(4) Autos total credit exposure includes securitization financing facilities secured by auto loans and leases, extended mainly to the finance company subsidiaries of global auto manufacturers, bank subsidiaries and independent auto finance companies, of approximately $17.4 billion ($10.3 billion in funded, with more than 99% rated investment grade) as of December 31, 2022.

(5) In addition to this exposure, Citi has energy-related exposure within the public sector (e.g., energy-related state-owned entities) and the transportation and industrials sector (e.g., off-shore drilling entities) included in the table above. As of December 31, 2022, Citi's total exposure to these energy-related entities was approximately $4.7 billion, of which approximately $2.4 billion consisted of direct outstanding funded loans.

The following table details Citi's corporate credit portfolio by industry as of December 31, 2021:

					Non-investment grade			Selected metrics		
In millions of dollars	Total credit exposure	Funded[1]	Unfunded[1]	Investment grade	Non-criticized	Criticized performing	Criticized non-performing[2]	30 days or more past due and accruing	Net credit losses (recoveries)	Credit derivative hedges[3]
Transportation and industrials	$ 143,445	$ 51,502	$ 91,943	$ 110,047	$ 19,051	$ 13,196	$ 1,151	$ 384	$ 127	$ (8,791)
Autos[4]	48,210	18,662	29,548	39,824	5,365	2,906	115	49	2	(3,228)
Transportation	26,897	12,085	14,812	19,233	2,344	4,447	873	105	104	(1,334)
Industrials	68,338	20,755	47,583	50,990	11,342	5,843	163	230	21	(4,229)
Technology, media and telecom	84,333	28,542	55,791	64,676	15,873	3,587	197	156	11	(6,875)
Consumer retail	78,994	32,894	46,100	60,686	13,590	4,311	407	224	100	(5,115)
Real estate	69,808	46,220	23,588	58,089	6,761	4,923	35	116	50	(798)
Power, chemicals, metals and mining	65,641	20,224	45,417	53,575	10,708	1,241	117	292	22	(5,808)
Power	26,199	5,610	20,589	22,860	2,832	420	87	100	17	(3,032)
Chemicals	25,550	8,525	17,025	20,788	4,224	528	10	88	6	(2,141)
Metals and mining	13,892	6,089	7,803	9,927	3,652	293	20	104	(1)	(635)
Banks and finance companies	58,252	36,804	21,448	49,465	4,892	3,890	5	150	(5)	(680)
Energy and commodities[5]	48,973	13,485	35,488	38,972	7,517	2,220	264	224	78	(3,679)
Asset managers and funds	55,517	26,879	28,638	54,119	1,019	377	2	211	—	(869)
Health	33,393	8,826	24,567	27,600	4,702	942	149	95	—	(2,465)
Insurance	28,495	3,162	25,333	27,447	987	61	—	2	1	(2,711)
Public sector	23,842	12,464	11,378	21,035	1,527	1,275	5	37	(3)	(1,282)
Financial markets infrastructure	14,341	109	14,232	14,323	18	—	—	—	—	(22)
Securities firms	1,472	613	859	605	816	51	—	4	—	(5)
Other industries	6,591	2,803	3,788	4,151	1,890	489	61	—	5	(169)
Total	$ 713,097	$ 284,527	$ 428,570	$ 584,790	$ 89,351	$ 36,563	$ 2,393	$ 1,895	$ 386	$ (39,269)

(1) Excludes $0.6 billion and $0.1 billion of funded and unfunded exposure at December 31, 2021, respectively, primarily related to the delinquency-managed loans and unearned income. Funded balances also excludes loans carried at fair value of $6.1 billion at December 31, 2021.

(2) Includes non-accrual loan exposures and criticized unfunded exposures.

(3) Represents the amount of purchased credit protection in the form of derivatives to economically hedge funded and unfunded exposures. Of the $39.3 billion of purchased credit protection, $36.0 billion represents the total notional amount of purchased credit derivatives on individual reference entities. The remaining $3.3 billion represents the first loss tranche of portfolios of purchased credit derivatives with a total notional of $28.4 billion, where the protection seller absorbs the first loss on the referenced loan portfolios.

(4) Autos total credit exposure includes securitization financing facilities secured by auto loans and leases, extended mainly to the finance company subsidiaries of global auto manufacturers, bank subsidiaries and independent auto finance companies, of approximately $17.9 billion ($6.5 billion in funded, with more than 99% rated investment grade) at December 31, 2021.

(5) In addition to this exposure, Citi has energy-related exposure within the public sector (e.g., energy-related state-owned entities) and the transportation and industrials sector (e.g., off-shore drilling entities) included in the table above. As of December 31, 2021, Citi's total exposure to these energy-related entities was approximately $5.1 billion, of which approximately $2.6 billion consisted of direct outstanding funded loans.

Credit Risk Mitigation

As part of its overall risk management activities, Citigroup uses credit derivatives and other risk mitigants to hedge portions of the credit risk in its corporate credit portfolio, in addition to outright asset sales. Citi may enter into partial-term hedges as well as full-term hedges. In advance of the expiration of partial-term hedges, Citi will determine, among other factors, the economic feasibility of hedging the remaining life of the instrument. The results of the mark-to-market and any realized gains or losses on credit derivatives are reflected primarily in *Principal transactions* in the Consolidated Statement of Income.

At December 31, 2022, September 30, 2022 and December 31, 2021, *ICG* had economic hedges on the corporate credit portfolio of $39.8 billion, $36.5 billion and $39.3 billion, respectively. Citi's expected credit loss model used in the calculation of its ACL does not include the favorable impact of credit derivatives and other mitigants that are marked-to-market. In addition, the reported amounts of direct outstandings and unfunded lending commitments in the tables above do not reflect the impact of these hedging transactions. The credit protection was economically hedging underlying *ICG* corporate credit portfolio exposures with the following risk rating distribution:

Rating of Hedged Exposure

	December 31, 2022	September 30, 2022	December 31, 2021
AAA/AA/A	**39 %**	38 %	35 %
BBB	**45**	45	49
BB/B	**12**	13	13
CCC or below	**4**	4	3
Total	**100 %**	100 %	100 %

Loan Maturities and Fixed/Variable Pricing of Corporate Loans

In millions of dollars at December 31, 2022	Due within 1 year	Over 1 year but within 5 years	Over 5 years but within 15 years	Over 15 years	Total
Corporate loans					
In North America offices[1]					
Commercial and industrial loans	$ 23,636	$ 31,116	$ 1,328	$ 96	$ 56,176
Financial institutions	21,619	21,600	168	12	43,399
Mortgage and real estate[2]	7,028	5,074	4,348	1,379	17,829
Installment and other	9,605	12,747	1,287	128	23,767
Lease financing	86	188	34	—	308
Total	$ 61,974	$ 70,725	$ 7,165	$ 1,615	$ 141,479
In offices outside North America[1]					
Commercial and industrial loans	$ 70,210	$ 19,376	$ 4,300	$ 81	$ 93,967
Financial institutions	15,888	5,201	607	235	21,931
Mortgage and real estate[2]	1,946	1,592	566	75	4,179
Installment and other	12,386	7,109	1,256	2,596	23,347
Lease financing	6	40	—	—	46
Governments and official institutions	2,535	428	798	444	4,205
Total	$ 102,971	$ 33,746	$ 7,527	$ 3,431	$ 147,675
Corporate loans, net of unearned income[3]	$ 164,945	$ 104,471	$ 14,692	$ 5,046	$ 289,154
Loans at fixed interest rates[4]					
Commercial and industrial loans		$ 3,885	$ 1,045	$ 48	
Financial institutions		3,924	61	12	
Mortgage and real estate[2]		1,238	3,643	977	
Other[5]		4,148	261	6	
Lease financing		165	—	—	
Total		$ 13,360	$ 5,010	$ 1,043	
Loans at floating or adjustable interest rates[4]					
Commercial and industrial loans		$ 46,607	$ 4,583	$ 129	
Financial institutions		22,877	714	235	
Mortgage and real estate[2]		5,428	1,271	477	
Other[5]		16,136	3,080	3,162	
Lease financing		63	34	—	
Total		$ 91,111	$ 9,682	$ 4,003	
Total fixed/variable pricing of corporate loans with maturities due after one year, net of unearned income[3]		$ 104,471	$ 14,692	$ 5,046	

(1) North America includes the U.S., Canada and Puerto Rico. Mexico is included in offices outside North America. The classification between offices in North America and outside North America is based on the domicile of the booking unit. The differences between the domicile of the booking unit and the domicile of the managing unit are not material.

(2) Loans secured primarily by real estate.

(3) Corporate loans are net of unearned income of ($797) million. Unearned income on corporate loans primarily represents interest received in advance, but not yet earned, on loans originated on a discounted basis.

(4) Based on contractual terms. Repricing characteristics may effectively be modified from time to time using derivative contracts. See Note 23.

(5) Other includes installment and other and loans to government and official institutions.

CONSUMER CREDIT

PBWM fulfills a broad spectrum of customer financial needs, with U.S. Personal Banking providing retail banking, credit card, personal loan, mortgage and small business banking, and Global Wealth offering wealth management lending and other products globally to affluent to ultra-high-net-worth customer segments through the Private bank, Wealth at Work and Citigold. *PBWM*'s retail banking products include a generally prime portfolio built through well-defined lending parameters within Citi's risk appetite framework.

Legacy Franchises also provides such activities in its remaining markets through Asia Consumer and Mexico Consumer. The *Legacy Franchises* consumer credit information discussed below reflects only those exit market portfolios that remained held-for-investment (versus held-for-sale) as of each period. The Philippines was reclassified to held-for-sale as of 4Q21, followed by Malaysia, Thailand, Indonesia, Vietnam, Taiwan, India and Bahrain in 1Q22. As a result, China, Korea, Russia and Poland were the only portfolios that remained held-for-investment and are reflected in the discussion below as of 4Q22.

Consumer Credit Portfolio

The following table shows Citi's quarterly end-of-period consumer loans:[1]

In billions of dollars	4Q'21[2]	1Q'22[2]	2Q'22[2]	3Q'22[2]	**4Q'22[2]**
Personal Banking and Wealth Management					
U.S. Personal Banking					
Cards					
Branded cards	$ 87.9	$ 85.9	$ 91.6	$ 93.7	$ **100.2**
Retail services	46.0	44.1	45.8	46.7	**50.5**
Retail banking					
Mortgages[5]	30.2	30.5	32.3	32.3	**33.4**
Personal, small business and other	2.8	2.8	3.1	3.5	**3.7**
Global Wealth[3][4]					
Cards	4.0	3.8	4.0	4.0	**4.6**
Mortgages[5]	74.6	75.4	77.8	82.0	**84.0**
Personal, small business and other[6]	72.7	71.0	67.0	65.1	**60.6**
Total	**$ 318.2**	**$ 313.5**	**$ 321.6**	**$ 327.3**	**$ 337.0**
Legacy Franchises					
Asia Consumer[7]	$ 41.1	$ 19.5	$ 17.3	$ 13.4	$ **13.3**
Mexico Consumer (excludes Mexico SBMM)	13.3	13.6	13.5	13.7	**14.8**
Legacy Holdings Assets[8]	3.9	3.7	3.2	3.2	**3.0**
Total	**$ 58.3**	**$ 36.8**	**$ 34.0**	**$ 30.3**	**$ 31.1**
Total consumer loans	**$ 376.5**	**$ 350.3**	**$ 355.6**	**$ 357.6**	**$ 368.1**

(1) End-of-period loans include interest and fees on credit cards.

(2) *Legacy Franchises*—4Q22 Asia Consumer loan balances exclude approximately $12 billion of loans ($9 billion of retail banking loans and $3 billion of credit card loan balances) reclassified to held-for-sale (HFS) (in *Other assets* on the Consolidated Balance Sheet) as a result of Citi's signed agreements to sell its consumer banking businesses in four countries: Indonesia, Vietnam, Taiwan and India, which were reclassified to HFS starting 1Q22. (See *Legacy Franchises* above and Note 2 for additional information.) The Malaysia, Thailand and Bahrain sales closed during the fourth quarter of 2022 and were also reclassified to HFS starting 1Q22. The Philippines consumer banking business was reclassified to HFS from 4Q21 until the closing of its sale on August 1, 2022. Accordingly, loans from these sold businesses are excluded from the Asia Consumer loan balances as of the end of such periods.

(3) Consists of $98.2 billion, $99.3 billion, $94.6 billion, $94.1 billion and $92.7 billion of loans in North America as of December 31, 2022, September 30, 2022, June 30, 2022, March 31, 2022 and December 31, 2021, respectively. For additional information on the credit quality of the Global Wealth portfolio, see Note 14.

(4) Consists of $51.0 billion, $51.8 billion, $54.2 billion, $56.1 billion and $58.6 billion of loans outside North America as of December 31, 2022, September 30, 2022, June 30, 2022, March 31, 2022 and December 31, 2021, respectively.

(5) See Note 14 for details on loan-to-value ratios for the portfolios and FICO scores for the U.S. portfolio.

(6) At December 31, 2022, includes approximately $49 billion of classifiably managed loans. Over 90% of these loans are fully collateralized (consisting primarily of marketable investment securities, commercial real estate and limited partner capital commitments in private equity) and have experienced very low historical NCLs. As discussed below, approximately 95% of the classifiably managed portion of these loans are investment grade. See "Consumer Loan Delinquencies Amounts and Ratios" below for details on the delinquency-managed portfolio.

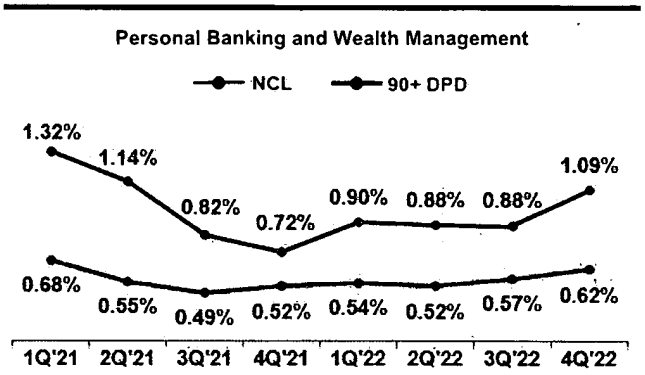
(7) Asia Consumer also includes loans and leases in certain EMEA countries for all periods presented.

(8) Primarily consists of certain North America consumer mortgages.

For information on changes to Citi's consumer loans, see "Liquidity Risk—Loans" below.

Consumer Credit Trends

Personal Banking and Wealth Management (PBWM)

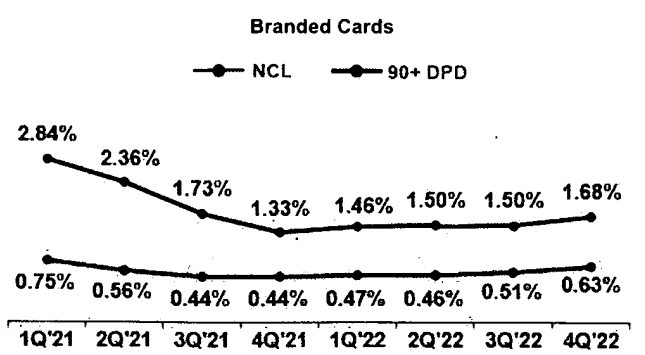


As indicated above, *PBWM* consists of U.S. Personal Banking and Global Wealth Management (Global Wealth). U.S. Personal Banking provides card products through Branded cards and Retail services, and also includes mortgages and home equity, small business and personal consumer loans through Citi's Retail banking network. The Retail bank is concentrated in six major U.S. metropolitan areas. Global Wealth provides investment services, cards, mortgages and personal, small business and other consumer loans through the Private bank, Wealth at Work and Citigold.

As of December 31, 2022, approximately 45% of *PBWM* consumer loans consisted of Branded cards and Retail services card loans, which generally drives the overall credit performance of *PBWM*, as U.S. Cards net credit losses represent approximately 90% of total *PBWM* losses.

As shown in the chart above, the fourth quarter of 2022 net credit loss rate in *PBWM* increased quarter-over-quarter and year-over-year, driven by an increase in net flow rates, primarily reflecting ongoing normalization from historically low levels in U.S. Cards.

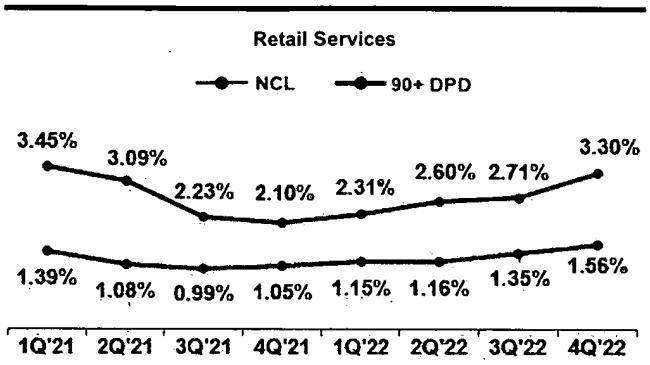
PBWM's 90+ days past due delinquency rate increased quarter-over-quarter and year-over-year, also driven by an increase in net flow rates, primarily reflecting the ongoing normalization in U.S. Cards.



U.S. Personal Banking's Branded cards portfolio includes proprietary and co-branded cards.

As shown in the chart above, the fourth quarter of 2022 net credit loss rate in Branded cards increased quarter-over-quarter and year-over-year, driven by an increase in net flow rates, primarily reflecting ongoing normalization from historically low levels.

The 90+ days past due delinquency rate increased quarter-over-quarter and year-over year, also driven by an increase in net flow rates, primarily reflecting the ongoing normalization.

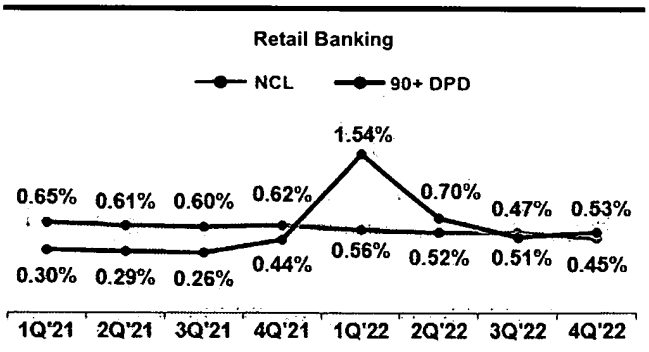


U.S. Personal Banking's Retail services partners directly with more than 20 retailers and dealers to offer private label and co-branded cards. Retail services' target market focuses on select industry segments such as home improvement, specialty retail, consumer electronics and fuel. Retail services continually evaluates opportunities to add partners within target industries that have strong loyalty, lending or payment programs and growth potential.

As shown in the chart above, the fourth quarter of 2022 net credit loss rate in Retail services increased quarter-over-quarter and year-over-year, driven by an increase in net flow rates, primarily reflecting the ongoing normalization from historically low levels.

The 90+ days past due delinquency rate increased quarter-over-quarter and year-over-year, also driven by an increase in net flow rates, primarily reflecting the ongoing normalization.

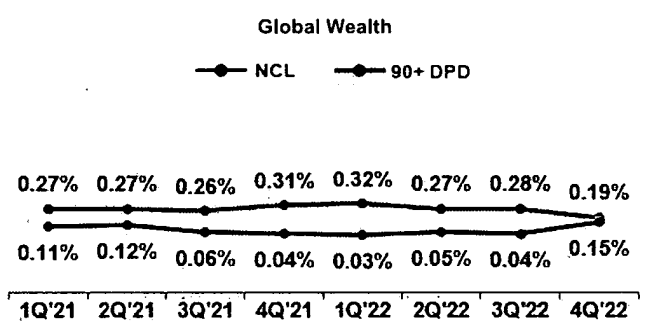
For additional information on cost of credit, loan delinquency and other information for Citi's cards portfolios, see each respective business's results of operations above and Note 14.



U.S. Personal Banking's Retail banking portfolio consists primarily of consumer mortgages (including home equity) and unsecured lending products, such as small business loans and personal loans. The portfolio is generally delinquency managed, where Citi evaluates credit risk based on FICO scores, delinquencies and the value of underlying collateral. The consumer mortgages in this portfolio have historically been extended to high credit quality customers, generally with loan-to-value ratios that are less than or equal to 80% on first and second mortgages. For additional information, see "Loan-to-Value (LTV) Ratios" in Note 14.

As shown in the chart above, the net credit loss rate in Retail banking for the fourth quarter of 2022 increased slightly quarter-over-quarter and year-over-year, primarily driven by the continued impact of industry-wide episodic overdraft losses.

The 90+ days past due delinquency rate decreased quarter-over-quarter and year-over-year, primarily driven by U.S. mortgages, which reflected the lasting effects of government stimulus, unemployment benefits and consumer relief programs.



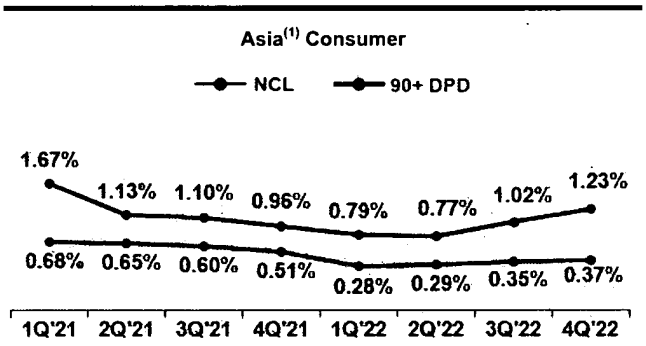
As discussed above, the Global Wealth credit portfolio primarily consists of consumer mortgages, cards and other lending products extended to customer segments that range from the affluent to ultra-high-net-worth through the Private bank, Wealth at Work and Citigold. These customer segments represent a target market that is characterized by historically low default rates and delinquencies.

As of December 31, 2022, approximately $49 billion, or 33%, of the portfolio was classifiably managed and primarily consisted of margin lending, commercial real estate, subscription credit finance and other lending programs. These classifiably managed loans are primarily evaluated for credit risk based on their internal risk rating, of which 95% is rated investment grade. While the delinquency rate in the chart above is calculated only for the delinquency-managed portfolio, the net credit loss rate is calculated using net credit losses for both the delinquency and classifiably managed portfolios.

As shown in the chart above, the net credit loss rate and 90+ days past due delinquency rate were broadly stable quarter-over-quarter and year-over-year, reflecting the strong credit profiles of the portfolios. The net credit loss rate increased slightly quarter-over-quarter, due to a classifiably managed loan charge-off. The low levels of net credit losses and the 90+ days past due delinquency rate continued to reflect the strong credit profiles of the portfolios.

Legacy Franchises

Legacy Franchises provides traditional retail banking and branded card products to retail and small business customers in Asia Consumer and Mexico Consumer.

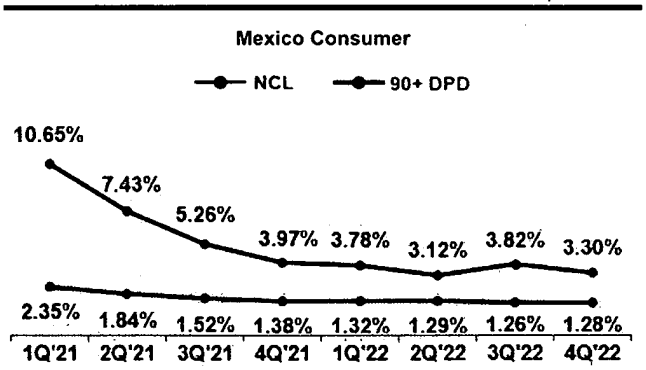


(1) Asia Consumer includes *Legacy Franchises* activities in certain EMEA countries for all periods presented.

As shown in the chart above, the fourth quarter of 2022 net credit loss rate in Asia Consumer for the remaining portfolios held-for-investment (China, Korea, Russia and Poland) increased quarter-over-quarter, primarily driven by lower average loans due to the ongoing wind-down of the businesses, particularly in Korea (decline of $1.5 billion) and the sale of the personal loan portfolio in Russia in the fourth quarter of 2022. The net credit loss rate increased year-over-year, primarily driven by lower average loans due to the ongoing wind-down of the businesses, particularly in Korea (decline of $7.8 billion) and the sale of the personal loan portfolio in Russia, partially offset by the reclassification of loans to held-for-sale during 2022.

The 90+ days past due delinquency rate was largely unchanged quarter-over-quarter and decreased year-over-year, mainly driven by the impact of the Asia Consumer held-for-sale reclassifications, partially offset by the effect of declining loans due to the ongoing wind-down of the businesses, including the sale of the personal loan portfolio in Russia.

The performance of Asia Consumer's portfolios continues to reflect the strong credit profiles in the region's target customer segments.



Mexico Consumer operates in Mexico through Citibanamex and provides credit cards, consumer mortgages and small business and personal loans. Mexico Consumer serves a more mass-market segment in Mexico and focuses on developing multiproduct relationships with customers.

As shown in the chart above, the fourth quarter of 2022 net credit loss rate in Mexico Consumer decreased quarter-over-quarter and year-over-year, primarily driven by the impact of the charge-off of peak delinquencies in early 2021, which resulted in lower delinquencies, leading to lower net credit losses in the current quarter.

The 90+ days past due delinquency rate was largely unchanged quarter-over-quarter and decreased year-over-year, primarily driven by the impact of the charge-off of peak delinquencies and higher payment rates.

For additional information on cost of credit, loan delinquency and other information for Citi's consumer loan portfolios, see each respective business's results of operations above and Note 14.

U.S. Cards FICO Distribution

The following tables show the current FICO score distributions for Citi's Branded cards and Retail services portfolios based on end-of-period receivables. FICO scores are updated monthly for substantially all of the portfolio and on a quarterly basis for the remaining portfolio.

Branded Cards

FICO distribution[1]	Dec. 31, 2022	Sept. 30, 2022	Dec. 31, 2021
> 760	48 %	48 %	49 %
680–760	38	38	38
< 680	14	14	13
Total	100 %	100 %	100 %

Retail Services

FICO distribution[1]	Dec. 31, 2022	Sept. 30, 2022	Dec. 31, 2021
> 760	27 %	27 %	28 %
680–760	42	43	44
< 680	31	30	28
Total	100 %	100 %	100 %

(1) The FICO bands in the tables are consistent with general industry peer presentations.

The FICO distribution of both cards portfolios shifted slightly lower across the credit bands from the prior quarter and the prior year consistent with the ongoing normalization in net credit loss and delinquency rates in the portfolios. The FICO distribution continues to reflect strong underlying credit quality and a benefit from the continued impacts of government stimulus, unemployment benefits and customer relief programs. See Note 14 for additional information on FICO scores.

Additional Consumer Credit Details

Consumer Loan Delinquencies Amounts and Ratios

In millions of dollars, except EOP loan amounts in billions	EOP loans[1] December 31, 2022	90+ days past due[2] December 31, 2022	2021	2020	30–89 days past due[2] December 31, 2022	2021	2020
Personal Banking and Wealth Management[3][4][5]							
Total	$ 337.0	$ 1,764	$ 1,350	$ 1,879	$ 2,037	$ 1,453	$ 1,794
Ratio		**0.61 %**	0.52 %	0.74 %	**0.71 %**	0.56 %	0.71 %
U.S. Personal Banking							
Total	$ 187.8	$ 1,578	$ 1,069	$ 1,588	$ 1,720	$ 1,130	$ 1,513
Ratio		**0.84 %**	0.64 %	0.95 %	**0.92 %**	0.68 %	0.90 %
Cards[4]							
Total	$ 150.7	$ 1,415	$ 871	$ 1,330	$ 1,511	$ 947	$ 1,228
Ratio		**0.94 %**	0.65 %	1.02 %	**1.00 %**	0.71 %	0.94 %
Branded cards	100.2	629	389	686	693	408	589
Ratio		**0.63 %**	0.44 %	0.82 %	**0.69 %**	0.46 %	0.70 %
Retail services	50.5	786	482	644	818	539	639
Ratio		**1.56 %**	1.05 %	1.39 %	**1.62 %**	1.17 %	1.38 %
Retail banking[3]	37.1	163	198	258	209	183	285
Ratio		**0.45 %**	0.62 %	0.70 %	**0.57 %**	0.57 %	0.77 %
Global Wealth delinquency-managed loans[5]	$ 100.0	$ 186	$ 281	$ 291	$ 317	$ 323	$ 281
Ratio		**0.19 %**	0.31 %	0.34 %	**0.32 %**	0.35 %	0.33 %
Global Wealth classifiably managed loans[6]	$ 49.2	N/A	N/A	N/A	N/A	N/A	N/A
Legacy Franchises							
Total	$ 31.1	$ 389	$ 613	$ 1,131	$ 335	$ 546	$ 1,083
Ratio		**1.26 %**	1.06 %	1.47 %	**1.09 %**	0.94 %	1.41 %
Asia Consumer[7][8]	13.3	49	209	456	70	285	514
Ratio		**0.37 %**	0.51 %	0.81 %	**0.53 %**	0.69 %	0.92 %
Mexico Consumer	14.8	190	183	363	186	173	390
Ratio		**1.28 %**	1.38 %	2.49 %	**1.26 %**	1.30 %	2.67 %
Legacy Holdings Assets (consumer)[9]	3.0	150	221	312	79	88	179
Ratio		**5.56 %**	6.31 %	5.03 %	**2.93 %**	2.51 %	2.89 %
Total Citigroup consumer	$ 368.1	$ 2,153	$ 1,963	$ 3,010	$ 2,372	$ 1,999	$ 2,877
Ratio		**0.68 %**	0.62 %	0.91 %	**0.75 %**	0.63 %	0.87 %

(1) End-of-period (EOP) loans include interest and fees on credit cards.

(2) The ratios of 90+ days past due and 30–89 days past due are calculated based on EOP loans, net of unearned income.

(3) The 90+ days past due and 30–89 days past due and related ratios for Retail banking exclude loans guaranteed by U.S. government-sponsored agencies since the potential risk of loss predominantly resides with the U.S. government-sponsored agencies. The amounts excluded for loans 90+ days past due and (EOP loans) were $89 million ($0.6 billion), $185 million ($1.1 billion) and $171 million ($0.7 billion) at December 31, 2022, 2021 and 2020, respectively. The amounts excluded for loans 30–89 days past due (the 30–89 days past due EOP loans have the same adjustments as the 90+ days past due EOP loans) were $70 million, $74 million and $98 million at December 31, 2022, 2021 and 2020, respectively. The EOP loans in the table include the guaranteed loans.

(4) The 90+ days past due balances for Branded cards and Retail services are generally still accruing interest. Citi's policy is generally to accrue interest on credit card loans until 180 days past due, unless notification of bankruptcy filing has been received earlier.

(5) Excludes EOP classifiably managed Private bank loans. These loans are not included in the delinquency numerator, denominator and ratios.

(6) These loans are evaluated for non-accrual status and write-off primarily based on their internal risk classification and not solely on their delinquency status, and therefore delinquency metrics are excluded from this table. As of December 31, 2022, 2021 and 2020, 96%, 94% and 92% of Global Wealth classifiably managed loans were rated investment grade. For additional information on the credit quality of the Global Wealth portfolio, including classifiably managed portfolios, see "Consumer Credit Trends" above.

(7) Asia Consumer includes delinquencies and loans in certain EMEA countries for all periods presented.

(8) Citi recently entered into agreements to sell certain Asia consumer banking businesses. Accordingly, the loans of these businesses have been reclassified as HFS in *Other assets* on the Consolidated Balance Sheet, and hence the loans and related delinquencies and ratios are not included in this table. The reclassifications commenced as follows: Australia (3Q21, and closed on June 1, 2022), the Philippines (4Q21, and closed on August 1, 2022) and Bahrain, India, Indonesia, Malaysia, Taiwan, Thailand and Vietnam (1Q22) (Bahrain, Malaysia and Thailand closed in 4Q22). See Note 2 for additional information.

(9) The 90+ days past due and 30–89 days past due and related ratios exclude U.S. mortgage loans that are primarily related to U.S. mortgages guaranteed by U.S. government-sponsored agencies since the potential risk of loss predominantly resides with the U.S. agencies. The amounts excluded for 90+ days past due and (EOP loans) were $90 million ($0.3 billion), $138 million ($0.4 billion) and $183 million ($0.5 billion) at December 31, 2022, 2021 and 2020, respectively. The amounts excluded for loans 30–89 days past due (the 30–89 days past due EOP loans have the same adjustments as the 90+ days past due EOP loans) were $37 million, $35 million and $73 million at December 31, 2022, 2021 and 2020, respectively. The EOP loans in the table include the guaranteed loans.

N/A Not applicable

Consumer Loan Net Credit Losses and Ratios

	Average loans[1]	Net credit losses[2]		
In millions of dollars, except average loan amounts in billions	2022	2022	2021	2020
Personal Banking and Wealth Management[2]				
Total	$ 321.0	$ 3,021	$ 3,061	$ 5,229
Ratio		**0.94 %**	1.00 %	1.72 %
U.S. Personal Banking				
Total	$ 170.7	$ 2,918	$ 2,939	$ 4,990
Ratio		**1.71 %**	1.85 %	2.95 %
Cards				
Total	**135.6**	**2,640**	2,828	4,858
Ratio		**1.95 %**	2.28 %	3.71 %
Branded cards	**89.8**	**1,384**	1,659	2,708
Ratio		**1.54 %**	2.05 %	3.20 %
Retail services	**45.8**	**1,256**	1,169	2,150
Ratio		**2.74 %**	2.71 %	4.62 %
Retail banking	**35.1**	**278**	111	132
Ratio		**0.79 %**	0.32 %	0.35 %
Global Wealth	$ 150.3	$ 103	$ 122	$ 239
Ratio		**0.07 %**	0.08 %	0.18 %
Legacy Franchises				
Total	$ 34.4	$ 590	$ 1,448	$ 1,482
Ratio		**1.72 %**	2.12 %	1.96 %
Asia Consumer[3][4]	**17.4**	**160**	610	640
Ratio		**0.92 %**	1.23 %	1.22 %
Mexico Consumer	**13.6**	**476**	920	866
Ratio		**3.50 %**	6.87 %	5.97 %
Legacy Holdings Assets (consumer)	**3.4**	**(46)**	(82)	(24)
Ratio		**(1.35)%**	(1.53)%	(0.27)%
Total Citigroup	$ 355.4	$ 3,611	$ 4,509	$ 6,711
Ratio		**1.02 %**	1.20 %	1.77 %

(1) Average loans include interest and fees on credit cards.

(2) The ratios of net credit losses are calculated based on average loans, net of unearned income.

(3) Asia Consumer includes NCLs and average loans in certain EMEA countries (Russia, Poland and Bahrain) for all periods presented.

(4) Citi recently entered into agreements to sell certain Asia consumer banking businesses, which have been reclassified as HFS in *Other assets* and *Other liabilities* on the Consolidated Balance Sheet. As a result, approximately $155 million and $6 million in related net credit losses (NCLs) were recorded as a reduction in revenue (*Other revenue*) in 2022 and 2021, respectively. Accordingly, these NCLs are not included in this table. The reclassifications commenced as follows: Australia (3Q21, and closed on June 1, 2022), the Philippines (4Q21, and closed on August 1, 2022) and Bahrain, India, Indonesia, Malaysia, Taiwan, Thailand and Vietnam (1Q22) (Bahrain, Malaysia and Thailand closed in 4Q22). See Note 2 for additional information.

Loan Maturities and Fixed/Variable Pricing of Consumer Loans

Loan Maturities

In millions of dollars at December 31, 2022	Due within 1 year	Greater than 1 year but within 5 years	Greater than 5 years but within 15 years	Greater than 15 years	Total
In North America offices					
Residential first mortgages	$ 4	$ 181	$ 3,513	$ 92,341	$ 96,039
Home equity loans	551	42	1,669	2,318	4,580
Credit cards[1]	149,822	821	—	—	150,643
Personal, small business and other	33,271	3,945	340	196	37,752
Total	$ 183,648	$ 4,989	$ 5,522	$ 94,855	$ 289,014
In offices outside North America					
Residential mortgages	$ 2,994	$ 372	$ 4,374	$ 20,374	$ 28,114
Credit cards[1]	12,885	70	—	—	12,955
Personal, small business and other	29,637	7,179	588	580	37,984
Total	$ 45,516	$ 7,621	$ 4,962	$ 20,954	$ 79,053

(1) Credit card loans with maturities greater than one year represent TDRs and are at fixed interest rates.

Fixed/Variable Pricing

In millions of dollars at December 31, 2022	Due within 1 year	Greater than 1 year but within 5 years	Greater than 5 years but within 15 years	Greater than 15 years	Total
Loans at fixed interest rates					
Residential first mortgages	$ 2,050	$ 263	$ 2,691	$ 59,918	$ 64,922
Home equity loans	5	39	298	147	489
Credit cards[1]	41,913	891	—	—	42,804
Personal, small business and other	9,748	5,380	343	192	15,663
Total	$ 53,716	$ 6,573	$ 3,332	$ 60,257	$ 123,878
Loans at floating or adjustable interest rates					
Residential first mortgages	$ 948	$ 290	$ 5,196	$ 52,797	$ 59,231
Home equity loans	546	3	1,371	2,171	4,091
Credit cards[1]	120,794	—	—	—	120,794
Personal, small business and other	53,160	5,744	585	584	60,073
Total	$ 175,448	$ 6,037	$ 7,152	$ 55,552	$ 244,189

(1) Credit card loans with maturities greater than one year represent TDRs and are at fixed interest rates.

ADDITIONAL CONSUMER AND CORPORATE CREDIT DETAILS

Loans Outstanding

In millions of dollars	December 31, 2022	2021	2020	2019	2018
Consumer loans					
In North America offices[1]					
Residential first mortgages[2]	$ 96,039	$ 83,361	$ 83,956	$ 78,664	$ 75,074
Home equity loans[2]	4,580	5,745	7,890	10,174	12,675
Credit cards	150,643	133,868	130,385	149,163	144,542
Personal, small business and other	37,752	40,713	39,259	36,548	35,733
Total	$ 289,014	$ 263,687	$ 261,490	$ 274,549	$ 268,024
In offices outside North America[1]					
Residential mortgages[2]	$ 28,114	$ 37,889	$ 42,817	$ 40,467	$ 39,314
Credit cards	12,955	17,808	22,692	25,909	24,951
Personal, small business and other	37,984	57,150	59,475	60,013	52,052
Total	$ 79,053	$ 112,847	$ 124,984	$ 126,389	$ 116,317
Consumer loans, net of unearned income[3]	$ 368,067	$ 376,534	$ 386,474	$ 400,938	$ 384,341
Corporate loans					
In North America offices[1]					
Commercial and industrial	$ 56,176	$ 48,364	$ 53,930	$ 52,229	$ 56,957
Financial institutions	43,399	49,804	39,390	38,782	34,906
Mortgage and real estate[2]	17,829	15,965	16,522	13,696	14,490
Installment and other	23,767	20,143	17,362	22,219	23,759
Lease financing	308	415	673	1,290	1,429
Total	$ 141,479	$ 134,691	$ 127,877	$ 128,216	$ 131,541
In offices outside North America[1]					
Commercial and industrial	$ 93,967	$ 102,735	$ 103,234	$ 112,332	$ 113,662
Financial institutions	21,931	22,158	25,111	28,176	26,602
Mortgage and real estate[2]	4,179	4,374	5,277	4,325	2,920
Installment and other	23,347	22,812	24,034	21,273	20,458
Lease financing	46	40	65	95	152
Governments and official institutions	4,205	4,423	3,811	4,128	4,520
Total	$ 147,675	$ 156,542	$ 161,532	$ 170,329	$ 168,314
Corporate loans, net of unearned income[4]	$ 289,154	$ 291,233	$ 289,409	$ 298,545	$ 299,855
Total loans—net of unearned income	$ 657,221	$ 667,767	$ 675,883	$ 699,483	$ 684,196
Allowance for credit losses on loans (ACLL)	(16,974)	(16,455)	(24,956)	(12,783)	(12,315)
Total loans—net of unearned income and ACLL	$ 640,247	$ 651,312	$ 650,927	$ 686,700	$ 671,881
ACLL as a percentage of total loans—net of unearned income[5]	2.60 %	2.49 %	3.73 %	1.84 %	1.81 %
ACLL for consumer loan losses as a percentage of total consumer loans—net of unearned income[5]	3.84 %	3.73 %	5.22 %	2.51 %	2.52 %
ACLL for corporate loan losses as a percentage of total corporate loans—net of unearned income[5]	1.01 %	0.85 %	1.69 %	0.93 %	0.89 %

(1) North America includes the U.S., Canada and Puerto Rico. Mexico is included in offices outside North America. The classification of corporate loans between offices in North America and outside North America is based on the domicile of the booking unit. The difference between the domicile of the booking unit and the domicile of the managing unit is not material.

(2) Loans secured primarily by real estate.

(3) Consumer loans are net of unearned income of $712 million, $629 million, $692 million, $732 million and $703 million at December 31, 2022, 2021, 2020, 2019 and 2018, respectively. Unearned income on consumer loans primarily represents unamortized origination fees and costs, premiums and discounts.

(4) Corporate loans include Mexico SBMM loans and are net of unearned income of $(797) million, $(770) million, $(787) million, $(763) million and $(817) million at December 31, 2022, 2021, 2020, 2019 and 2018, respectively. Unearned income on corporate loans primarily represents interest received in advance, but not yet earned, on loans originated on a discounted basis.

(5) Because loans carried at fair value do not have an ACLL, they are excluded from the ACLL ratio calculation.

Details of Credit Loss Experience

In millions of dollars	2022	2021	2020	2019	2018
Allowance for credit losses on loans (ACLL) at beginning of year	$ **16,455**	$ 24,956	$ 12,783	$ 12,315	$ 12,355
Adjustments to opening balance:					
Financial instruments—credit losses (CECL)[1]	—	—	4,201	—	—
Variable post-charge-off third-party collection costs[2]	—	—	(443)	—	—
Adjusted ACLL at beginning of year	$ **16,455**	$ 24,956	$ 16,541	$ 12,315	$ 12,355
Provision for credit losses on loans (PCLL)					
Consumer[2]	**4,128**	(1,159)	12,222	7,788	7,261
Corporate	**617**	(1,944)	3,700	430	93
Total	$ **4,745**	$ (3,103)	$ 15,922	$ 8,218	$ 7,354
Gross credit losses on loans					
Consumer					
In U.S. offices	$ **3,944**	$ 4,076	$ 6,141	$ 6,590	$ 5,974
In offices outside the U.S.	**934**	2,144	2,146	2,316	2,352
Corporate					
Commercial and industrial, and other					
In U.S. offices	**110**	228	466	213	119
In offices outside the U.S.	**81**	259	409	196	206
Loans to financial institutions					
In U.S. offices	—	1	14	—	3
In offices outside the U.S.	**80**	1	12	3	7
Mortgage and real estate					
In U.S. offices	—	10	71	23	2
In offices outside the U.S.	**7**	1	4	—	2
Total	$ **5,156**	$ 6,720	$ 9,263	$ 9,341	$ 8,665
Gross recoveries on loans[2]					
Consumer					
In U.S. offices	$ **1,045**	$ 1,215	$ 1,094	$ 988	$ 918
In offices outside the U.S.	**222**	496	482	504	502
Corporate					
Commercial and industrial, and other					
In U.S. offices	**44**	57	34	15	39
In offices outside the U.S.	**46**	54	27	58	79
Loans to financial institutions					
In U.S. offices	**6**	2	—	—	—
In offices outside the U.S.	**3**	1	14	—	6
Mortgage and real estate					
In U.S. offices	—	—	—	8	7
In offices outside the U.S.	**1**	—	1	—	1
Total	$ **1,367**	$ 1,825	$ 1,652	$ 1,573	$ 1,552
Net credit losses on loans (NCLs)					
In U.S. offices	$ **2,959**	$ 3,041	$ 5,564	$ 5,815	$ 5,134
In offices outside the U.S.	**830**	1,854	2,047	1,953	1,979
Total	$ **3,789**	$ 4,895	$ 7,611	$ 7,768	$ 7,113
Other—net[3][4][5][6][7][8]	$ **(437)**	$ (503)	$ 104	$ 18	$ (281)
Allowance for credit losses on loans (ACLL) at end of year	$ **16,974**	$ 16,455	$ 24,956	$ 12,783	$ 12,315
ACLL as a percentage of EOP loans[9]	**2.60 %**	2.49 %	3.73 %	1.84 %	1.81 %
Allowance for credit losses on unfunded lending commitments (ACLUC)[10][11]	$ **2,151**	$ 1,871	$ 2,655	$ 1,456	$ 1,367

Total ACLL and ACLUC	$	**19,125**	$	18,326	$	27,611	$	14,239	$	13,682
Net consumer credit losses on loans	$	**3,611**	$	4,509	$	6,711	$	7,414	$	6,906
As a percentage of average consumer loans		**1.02 %**		1.20 %		1.77 %		1.94 %		1.84 %
Net corporate credit losses on loans	$	**178**	$	386	$	900	$	354	$	207
As a percentage of average corporate loans		**0.06 %**		0.13 %		0.29 %		0.12 %		0.07 %
ACLL by type at end of year[12]										
Consumer	$	**14,119**	$	14,040	$	20,180	$	10,056	$	9,670
Corporate		**2,855**		2,415		4,776		2,727		2,645
Total	$	**16,974**	$	16,455	$	24,956	$	12,783	$	12,315

(1) On January 1, 2020, Citi adopted Accounting Standards Codification (ASC) 326, *Financial Instruments—Credit Losses (CECL)*. The ASC introduces a new credit loss methodology requiring earlier recognition of credit losses while also providing additional disclosure about credit risk. On January 1, 2020, Citi recorded a $4.1 billion, or an approximate 29%, pretax increase in the *Allowance for credit losses*, along with a $3.1 billion after-tax decrease in *Retained earnings* and a deferred tax asset increase of $1.0 billion. This transition impact reflects (i) a $4.9 billion build to the consumer ACL due to longer estimated tenors than under the incurred loss methodology under prior U.S. GAAP, net of recoveries, and (ii) a $0.8 billion decrease to the corporate ACL due to shorter remaining tenors, incorporation of recoveries and use of more specific historical loss data based on an increase in portfolio segmentation across industries and geographies. See Note 1 for further discussion on the impact of Citi's adoption of CECL.

(2) Citi had a change in accounting related to its variable post-charge-off third-party collection costs that was recorded as an adjustment to its January 1, 2020 opening allowance for credit losses on loans of $443 million. See Note 1.

(3) Includes all adjustments to the allowance for credit losses, such as changes in the allowance from acquisitions, dispositions, securitizations, FX translation, purchase accounting adjustments, etc.

(4) 2022 includes an approximate $350 million reclass related to the announced sales of Citi's consumer banking businesses in Thailand, India, Malaysia, Taiwan, Indonesia, Bahrain and Vietnam. Also includes a decrease of approximately $100 million related to FX translation.

(5) 2021 includes an approximate $280 million reclass related to Citi's agreement to sell its Australia consumer banking business and an approximate $90 million reclass related to Citi's agreement to sell its Philippines consumer banking business. Those ACLL were reclassified to *Other assets* during 2021. 2021 also includes a decrease of approximately $134 million related to FX translation.

(6) 2020 includes reductions of approximately $4 million related to the transfer to HFS of various real estate loan portfolios. In addition, 2020 includes an increase of approximately $97 million related to FX translation.

(7) 2019 includes reductions of approximately $42 million related to the sale or transfer to HFS of various loan portfolios. In addition, 2019 includes a reduction of approximately $60 million related to FX translation.

(8) 2018 includes reductions of approximately $201 million related to the sale or transfer to HFS of various loan portfolios, which include approximately $106 million related to the transfer of various real estate loan portfolios to HFS.

(9) December 31, 2022, 2021, 2020, 2019 and 2018 exclude $5.4 billion, $6.1 billion, $6.9 billion, $4.1 billion and $3.2 billion, respectively, of loans that are carried at fair value.

(10) 2020 corporate ACLUC includes a non-provision transfer of $68 million, representing reserves on performance guarantees. The reserves on these contracts were reclassified out of the ACL on unfunded lending commitments and into other liabilities.

(11) Represents additional credit reserves recorded as *Other liabilities* on the Consolidated Balance Sheet.

(12) Beginning in 2020, under CECL, the ACLL represents management's estimate of expected credit losses in the portfolio and troubled debt restructurings. See "Significant Accounting Policies and Significant Estimates" and Note 1 below. Attribution of the ACLL is made for analytical purposes only and the entire ACLL is available to absorb credit losses in the overall portfolio. Prior to 2020, the ACLL represented management's estimate of probable losses inherent in the portfolio, as well as probable losses related to large individually evaluated impaired loans and TDRs.

Allowance for Credit Losses on Loans (ACLL)

The following tables detail information on Citi's ACLL, loans and coverage ratios:

In billions of dollars	December 31, 2022 ACLL	EOP loans, net of unearned income	ACLL as a percentage of EOP loans[1]
Consumer			
North America cards[2]	$ 11.4	$ 150.6	7.6 %
North America mortgages[3]	0.5	100.4	0.5
North America other[3]	0.6	37.8	1.6
International cards	0.8	13.0	6.2
International other[3]	0.8	66.0	1.2
Total[1]	$ 14.1	$ 367.8	3.8 %
Corporate			
Commercial and industrial	$ 1.9	$ 147.8	1.3 %
Financial institutions	0.4	64.9	0.6
Mortgage and real estate	0.4	21.9	1.8
Installment and other	0.2	49.4	0.4
Total[1]	$ 2.9	$ 284.0	1.0 %
Loans at fair value[1]	N/A	$ 5.4	N/A
Total Citigroup	$ 17.0	$ 657.2	2.6 %

In billions of dollars	December 31, 2021 ACLL	EOP loans, net of unearned income	ACLL as a percentage of EOP loans[1]
Consumer			
North America cards[2]	$ 10.8	$ 133.9	8.1 %
North America mortgages[3]	0.5	89.1	0.6
North America other[3]	0.4	40.7	1.0
International cards	1.2	17.8	6.7
International other[3]	1.2	95.0	1.3
Total[1]	$ 14.1	$ 376.5	3.7 %
Corporate			
Commercial and industrial	$ 1.6	$ 147.0	1.1 %
Financial institutions	0.3	71.8	0.4
Mortgage and real estate	0.3	20.3	1.5
Installment and other	0.2	46.1	0.4
Total[1]	$ 2.4	$ 285.2	0.8 %
Loans at fair value[1]	N/A	$ 6.1	N/A
Total Citigroup	$ 16.5	$ 667.8	2.5 %

(1) Excludes loans carried at fair value, since they do not have an ACLL and are excluded from the ACLL ratio calculation.

(2) Includes both Branded cards and Retail services. As of December 31, 2022, the $11.4 billion of ACLL represented approximately 43 months of coincident net credit loss coverage (based on 4Q22 NCLs). As of December 31, 2022, Branded cards ACLL as a percentage of EOP loans was 6.2% and Retail services ACLL as a percentage of EOP loans was 10.3%. As of December 31, 2021, the $10.8 billion of ACLL represented approximately 63 months of coincident net credit loss coverage (based on 4Q21 NCLs). The decrease in the coincident coverage ratio at December 31, 2022 was primarily due to the relatively higher levels of NCLs in 4Q22 versus 4Q21. As of December 31, 2021, Branded cards ACLL as a percentage of EOP loans was 7.1% and Retail services ACLL as a percentage of EOP loans was 10.0%.

(3) Includes residential mortgages, retail loans and personal, small business and other loans, including those extended through the Private bank network.

N/A Not applicable

The following table details Citi's corporate credit ACLL by industry exposure:

In millions of dollars, except percentages	December 31, 2022 Funded exposure[1]	ACLL	ACLL as a % of funded exposure
Transportation and industrials	$ 57,271	$ 699	1.2 %
Technology, media and telecom	28,931	330	1.1
Consumer retail	32,687	358	1.1
Real estate	48,539	500	1.0
Power, chemicals, metals and mining	18,326	288	1.6
Banks and finance companies	42,276	225	0.5
Energy and commodities	13,069	188	1.4
Asset managers and funds	13,162	38	0.3
Health	8,771	81	0.9
Insurance	4,417	11	0.2
Public sector	11,736	58	0.5
Financial markets infrastructure	60	—	—
Securities firms	569	11	1.9
Other industries	3,651	59	1.6
Total classifiably managed loans[2]	$ 283,465	$ 2,846	1.0 %
Loans managed on a delinquency basis[3]	$ 566	$ 9	1.6 %
Total	$ 284,031	$ 2,855	1.0 %

(1) Funded exposure excludes loans carried at fair value of $5.1 billion that are not subject to ACLL under the CECL standard.
(2) As of December 31, 2022, the ACLL shown above reflects coverage of 0.4% of funded investment-grade exposure and 3.0% of funded non-investment-grade exposure.
(3) Primarily associated with delinquency-managed loans including commercial credit cards and other loans, and unearned income at December 31, 2022.

The following table details Citi's corporate credit ACLL by industry exposure:

In millions of dollars, except percentages	December 31, 2021 Funded exposure[1]	ACLL	ACLL as a % of funded exposure
Transportation and industrials	$ 51,502	$ 597	1.2 %
Technology, media and telecom	28,542	170	0.6
Consumer retail	32,894	288	0.9
Real estate	46,220	509	1.1
Power, chemicals, metals and mining	20,224	151	0.7
Banks and finance companies	36,804	197	0.5
Energy and commodities	13,485	268	2.0
Asset managers and funds	26,879	34	0.5
Health	8,826	73	0.8
Insurance	3,162	8	0.3
Public sector	12,464	74	0.6
Financial markets infrastructure	109	—	—
Securities firms	613	10	1.6
Other industries	2,803	28	1.0
Total classifiably managed loans[2]	$ 284,527	$ 2,407	0.8 %
Loans managed on a delinquency basis[3]	$ 636	$ 8	1.3 %
Total	$ 285,163	$ 2,415	0.8 %

(1) Funded exposure excludes loans carried at fair value of $6.1 billion that are not subject to ACLL under the CECL standard.
(2) As of December 31, 2021, the ACLL shown above reflects coverage of 0.7% of funded investment-grade exposure and 2.3% of funded non-investment-grade exposure.
(3) Primarily associated with delinquency-managed loans including commercial credit cards and other loans, and unearned income at December 31, 2021.

Non-Accrual Loans and Assets and Renegotiated Loans
There is a certain amount of overlap among non-accrual loans and assets and renegotiated loans. The following summary provides a general description of each category.

Non-Accrual Loans and Assets:

- Corporate and consumer (including commercial banking) non-accrual status is based on the determination that payment of interest or principal is doubtful.
- A corporate loan may be classified as non-accrual and still be performing under the terms of the loan structure. Non-accrual loans may still be current on interest payments. Citi's corporate non-accrual loans were $1.1 billion, $1.5 billion and $1.6 billion as of December 31, 2022, September 30, 2022 and December 31, 2021, respectively. Of these, approximately 50%, 68% and 56% were performing at December 31, 2022, September 30, 2022 and December 31, 2021, respectively.
- Consumer non-accrual status is generally based on aging, i.e., the borrower has fallen behind on payments.
- Consumer mortgage loans, other than Federal Housing Administration (FHA) insured loans, are classified as non-accrual within 60 days of notification that the borrower has filed for bankruptcy. In addition, home equity loans are classified as non-accrual if the related residential first mortgage loan is 90 days or more past due.
- North America Branded cards and Retail services are not included because, under industry standards, credit card loans accrue interest until such loans are charged off, which typically occurs at 180 days of contractual delinquency.

Renegotiated Loans:

- Includes both corporate and consumer loans whose terms have been modified in a troubled debt restructuring (TDR).
- Includes both accrual and non-accrual TDRs.

Non-Accrual Loans

The table below summarizes Citigroup's non-accrual loans as of the periods indicated. Non-accrual loans may still be current on interest payments. In situations where Citi reasonably expects that only a portion of the principal owed will ultimately be collected, all payments received are reflected as a reduction of principal and not as interest income. For all other non-accrual loans, cash interest receipts are generally recorded as revenue.

	December 31,				
In millions of dollars	2022	2021	2020	2019	2018
Corporate non-accrual loans by region[1][2]					
North America	$ 138	$ 510	$ 1,486	$ 1,082	$ 416
EMEA	502	367	629	398	344
Latin America	429	568	719	473	307
Asia	53	108	212	71	243
Total	$ 1,122	$ 1,553	$ 3,046	$ 2,024	$ 1,310
Corporate non-accrual loans[1][2]					
Banking	$ 767	$ 1,239	$ 2,767	$ 1,742	$ 1,097
Services	153	70	79	113	137
Markets	3	12	21	2	1
Mexico SBMM	199	232	179	167	75
Total	$ 1,122	$ 1,553	$ 3,046	$ 2,024	$ 1,310
Consumer non-accrual loans[1]					
U.S. Personal Banking and Global Wealth	$ 541	$ 680	$ 950	$ 443	$ 455
Asia Consumer[3]	30	209	296	267	242
Mexico Consumer	457	524	774	632	638
Legacy Holdings Assets—Consumer	289	413	602	638	892
Total	$ 1,317	$ 1,826	$ 2,622	$ 1,980	$ 2,227
Total non-accrual loans	$ 2,439	$ 3,379	$ 5,668	$ 4,004	$ 3,537

(1) Corporate loans are placed on non-accrual status based upon a review by Citigroup's risk officers. Corporate non-accrual loans may still be current on interest payments. With limited exceptions, the following practices are applied for consumer loans: consumer loans, excluding credit cards and mortgages, are placed on non-accrual status at 90 days past due and are charged off at 120 days past due; residential mortgage loans are placed on non-accrual status at 90 days past due and written down to net realizable value at 180 days past due. Consistent with industry conventions, Citigroup generally accrues interest on credit card loans until such loans are charged off, which typically occurs at 180 days contractual delinquency. As such, the non-accrual loan disclosures do not include credit card loans. The balances above represent non-accrual loans within *Corporate loans* and *Consumer loans* on the Consolidated Balance Sheet.

(2) The December 31, 2022 total corporate non-accrual loans represented 0.39% of total corporate loans.

(3) Asia Consumer includes balances in certain EMEA countries for all periods presented.

The changes in Citigroup's non-accrual loans were as follows:

	Year ended December 31, 2022			Year ended December 31, 2021		
In millions of dollars	Corporate	Consumer	Total	Corporate	Consumer	Total
Non-accrual loans at beginning of year	$ 1,553	$ 1,826	$ 3,379	$ 3,046	$ 2,622	$ 5,668
Additions	2,123	1,374	3,497	1,466	2,260	3,726
Sales and transfers to HFS	(21)	(240)	(261)	(524)	(310)	(834)
Returned to performing	(378)	(408)	(786)	(219)	(723)	(942)
Paydowns/settlements	(1,814)	(585)	(2,399)	(1,721)	(780)	(2,501)
Charge-offs	(260)	(598)	(858)	(472)	(1,202)	(1,674)
Other	(81)	(52)	(133)	(23)	(41)	(64)
Ending balance	$ 1,122	$ 1,317	$ 2,439	$ 1,553	$ 1,826	$ 3,379

The table below summarizes Citigroup's other real estate owned (OREO) assets. OREO is recorded on the Consolidated Balance Sheet within *Other assets*. This represents the carrying value of all real estate property acquired by foreclosure or other legal proceedings when Citi has taken possession of the collateral:

	December 31,				
In millions of dollars	**2022**	2021	2020	2019	2018
OREO					
North America	$ **10**	$ 15	$ 19	$ 39	$ 64
EMEA	**—**	—	—	1	1
Latin America	**4**	8	7	14	12
Asia	**1**	4	17	7	22
Total OREO	$ **15**	$ 27	$ 43	$ 61	$ 99
Non-accrual assets					
Corporate non-accrual loans	$ **1,122**	$ 1,553	$ 3,046	$ 2,024	$ 1,310
Consumer non-accrual loans	**1,317**	1,826	2,622	1,980	2,227
Non-accrual loans (NAL)	$ **2,439**	$ 3,379	$ 5,668	$ 4,004	$ 3,537
OREO	$ **15**	$ 27	$ 43	$ 61	$ 99
Non-accrual assets (NAA)	$ **2,454**	$ 3,406	$ 5,711	$ 4,065	$ 3,636
NAL as a percentage of total loans	**0.37 %**	0.51 %	0.84 %	0.57 %	0.52 %
NAA as a percentage of total assets	**0.10**	0.15	0.25	0.21	0.19
ACLL as a percentage of NAL[1]	**696**	487	440	319	348

(1) The ACLL includes the allowance for Citi's credit card portfolios and purchased credit-deteriorated loans, while the non-accrual loans exclude credit card balances (with the exception of certain international portfolios) and, prior to 2020, include purchased credit-deteriorated loans as these continue to accrue interest until charge-off.

Renegotiated Loans

The following table presents Citi's loans modified in TDRs:

In millions of dollars	Dec. 31, 2022	Dec. 31, 2021
Corporate renegotiated loans[1]		
In U.S. offices		
Commercial and industrial[2]	$ 35	$ 103
Mortgage and real estate	2	2
Financial institutions	—	—
Other	11	20
Total	$ 48	$ 125
In offices outside the U.S.		
Commercial and industrial[2]	$ 50	$ 133
Mortgage and real estate	11	18
Financial institutions	—	—
Other	1	8
Total	$ 62	$ 159
Total corporate renegotiated loans	$ 110	$ 284
Consumer renegotiated loans[3]		
In U.S. offices		
Mortgage and real estate	$ 1,407	$ 1,485
Cards	1,180	1,269
Personal, small business and other	19	26
Total	$ 2,606	$ 2,780
In offices outside the U.S.		
Mortgage and real estate	$ 152	$ 227
Cards	75	313
Personal, small business and other	88	428
Total	$ 315	$ 968
Total consumer renegotiated loans	$ 2,921	$ 3,748

(1) Includes $108 million and $284 million of non-accrual loans included in the non-accrual loans table above at December 31, 2022 and 2021, respectively. The remaining loans were accruing interest.

(2) In addition to modifications reflected as TDRs at December 31, 2022 and 2021, Citi may have modifications that were not considered TDRs because the modifications did not involve a concession or because they qualified for exemptions from TDR accounting provided by the CARES Act or the interagency guidance.

(3) Includes $566 million and $664 million of non-accrual loans included in the non-accrual loans table above at December 31, 2022 and 2021, respectively. The remaining loans were accruing interest.

Forgone Interest Revenue on Loans[1]

In millions of dollars	In U.S. offices	In non-U.S. offices	2022 total
Interest revenue that would have been accrued at original contractual rates[2]	$ 331	$ 189	$ 520
Amount recognized as interest revenue[2]	158	121	279
Forgone interest revenue	$ 173	$ 68	$ 241

(1) Relates to corporate non-accrual loans, renegotiated loans and consumer loans on which accrual of interest has been suspended.

(2) Interest revenue in offices outside the U.S. may reflect prevailing local interest rates, including the effects of inflation and monetary correction in certain countries.

LIQUIDITY RISK

Overview

Adequate and diverse sources of funding and liquidity are essential to Citi's businesses. Funding and liquidity risks arise from several factors, many of which are mostly or entirely outside Citi's control, such as disruptions in the financial markets, changes in key funding sources, credit spreads, changes in Citi's credit ratings and macroeconomic, geopolitical and other conditions. For additional information, see "Risk Factors—Liquidity Risks" above.

Citi's funding and liquidity management objectives are aimed at (i) funding its existing asset base, (ii) growing its core businesses, (iii) maintaining sufficient liquidity, structured appropriately, so that Citi can operate under a variety of adverse circumstances, including potential Company-specific and/or market liquidity events in varying durations and severity, and (iv) satisfying regulatory requirements, including, but not limited to, those related to resolution planning (for additional information, see "Resolution Plan" and "Total Loss-Absorbing Capacity (TLAC)" below). Citigroup's primary liquidity objectives are established by entity, and in aggregate, across two major categories:

- Citibank (including Citibank Europe plc, Citibank Singapore Ltd. and Citibank (Hong Kong) Ltd.); and
- Citi's non-bank and other entities, including the parent holding company (Citigroup Inc.), Citi's primary intermediate holding company (Citicorp LLC), Citi's broker-dealer subsidiaries (including Citigroup Global Markets Inc., Citigroup Global Markets Limited and Citigroup Global Markets Japan Inc.) and other bank and non-bank subsidiaries that are consolidated into Citigroup (including Citibanamex).

At an aggregate Citigroup level, Citi's goal is to maintain sufficient funding in amount and tenor to fully fund customer assets and to provide an appropriate amount of cash and high-quality liquid assets (as discussed below), even in times of stress, in order to meet its payment obligations as they come due. The liquidity risk management framework provides that in addition to the aggregate requirements, certain entities be self-sufficient or net providers of liquidity, including in conditions established under their designated stress tests.

Citi's primary funding sources include (i) corporate and consumer deposits via Citi's bank subsidiaries, including Citibank, N.A. (Citibank), (ii) long-term debt (primarily senior and subordinated debt) mainly issued by Citigroup Inc., as the parent, and Citibank, and (iii) stockholders' equity. These sources may be supplemented by short-term borrowings, primarily in the form of secured funding transactions.

Citi's funding and liquidity framework, working in concert with overall asset/liability management, ensures that there is sufficient liquidity and tenor in the overall liability structure (including funding products) of the Company relative to the liquidity requirements of Citi's assets. This reduces the risk that liabilities will become due before assets mature or are monetized. The Company holds excess liquidity, primarily in the form of high-quality liquid assets (HQLA), as presented in the table below.

Citi's liquidity is managed centrally by Corporate Treasury, in conjunction with regional and in-country treasurers with oversight provided by Independent Risk Management and various Asset & Liability Committees (ALCOs) at the individual entity, region, country and business levels. Pursuant to this approach, Citi's HQLA are managed with emphasis on asset/liability management and entity-level liquidity adequacy throughout Citi.

Citi's CRO and CFO co-chair Citigroup's ALCO, which includes Citi's Treasurer and other senior executives. The ALCO sets the strategy of the liquidity portfolio and monitors portfolio performance (for additional information about the ALCO, see "Risk Governance—Board and Executive Management Committees" above). Significant changes to portfolio asset allocations are approved by the ALCO. Citi also has other ALCOs, which are established at various organizational levels to ensure appropriate oversight for individual entities, countries, franchise businesses and regions, serving as the primary governance committees for managing Citi's balance sheet and liquidity.

As a supplement to ALCO, Citi's Funding and Liquidity Risk Committee (FLRC) is focused on funding and liquidity risk matters. The FLRC reviews and discusses the funding and liquidity risk profile of, as well as risk management practices for, Citigroup and Citibank and reports its findings and recommendations to each relevant ALCO as appropriate.

Liquidity Monitoring and Measurement

Stress Testing

Liquidity stress testing is performed for each of Citi's major entities, operating subsidiaries and countries. Stress testing and scenario analyses are intended to quantify the potential impact of an adverse liquidity event on the balance sheet and liquidity position, in order to have sufficient liquidity on hand to manage through such an event. These scenarios include assumptions about significant changes in key funding sources, market triggers (such as credit ratings), potential uses of funding and macroeconomic, geopolitical and other conditions. These conditions include expected and stressed market conditions as well as Company-specific events.

Liquidity stress tests are performed to ascertain potential mismatches between liquidity sources and uses over a variety of time horizons and over different stressed conditions. To monitor the liquidity of an entity, these stress tests and potential mismatches are calculated on a daily basis.

Given the range of potential stresses, Citi maintains contingency funding plans on a consolidated basis and for individual entities. These plans specify a wide range of readily available actions for a variety of adverse market conditions or idiosyncratic stresses.

High-Quality Liquid Assets (HQLA)

In billions of dollars	Citibank			Citi non-bank and other entities			Total		
	Dec. 31, 2022	Sept. 30, 2022	Dec. 31, 2021	Dec. 31, 2022	Sept. 30, 2022	Dec. 31, 2021	Dec. 31, 2022	Sept. 30, 2022	Dec. 31, 2021
Available cash	$ 241.2	$ 202.2	$ 253.6	$ 4.3	$ 2.1	$ 2.6	$ 245.5	$ 204.3	$ 256.2
U.S. sovereign	130.0	144.6	119.6	68.7	69.4	63.1	198.7	214.0	182.7
U.S. agency/agency MBS	46.3	52.5	45.0	4.0	4.7	5.7	50.3	57.2	50.7
Foreign government debt[1]	59.1	63.3	48.9	19.4	15.7	13.6	78.5	79.0	62.5
Other investment grade	1.7	2.0	1.6	0.5	0.6	0.8	2.2	2.6	2.4
Total HQLA (AVG)	$ 478.3	$ 464.6	$ 468.7	$ 96.9	$ 92.5	$ 85.8	$ 575.2	$ 557.1	$ 554.5

Note: The amounts shown in the table above are presented on an average basis. For securities, the amounts represent the liquidity value that potentially could be realized and, therefore, exclude any securities that are encumbered and incorporate any haircuts applicable under the U.S. LCR rule. The table above incorporates various restrictions that could limit the transferability of liquidity between legal entities, including Section 23A of the Federal Reserve Act.

(1) Foreign government debt includes securities issued or guaranteed by foreign sovereigns, agencies and multilateral development banks. Foreign government debt securities are held largely to support local liquidity requirements and Citi's local franchises and principally include government bonds from Japan, Korea, Mexico, Singapore and Hong Kong.

The table above includes average amounts of HQLA held at Citigroup's operating entities that are eligible for inclusion in the calculation of Citigroup's consolidated Liquidity Coverage ratio (LCR), pursuant to the U.S. LCR rules. These amounts include the HQLA needed to meet the minimum requirements at these entities as well as any amounts in excess of these minimums that are available to be transferred to other entities within Citigroup. Citigroup's average HQLA increased quarter-over-quarter as of the fourth quarter of 2022, primarily driven by wholesale unsecured debt issuances.

As of December 31, 2022, Citigroup had approximately $1,045 billion of available liquidity resources to support client and business needs, including end-of-period HQLA assets; additional unencumbered securities, including excess liquidity held at bank entities that is non-transferable to other entities within Citigroup; available assets not already accounted for within Citi's HQLA to support the Federal Home Loan Bank (FHLB); and Federal Reserve Bank discount window borrowing capacity.

Short-Term Liquidity Measurement: Liquidity Coverage Ratio (LCR)

In addition to internal 30-day liquidity stress testing performed for Citi's major entities, operating subsidiaries and countries, Citi also monitors its liquidity by reference to the LCR.

The LCR is calculated by dividing HQLA by estimated net outflows assuming a stressed 30-day period, with the net outflows determined by standardized stress outflow and inflow rates prescribed in the LCR rule. The outflows are partially offset by contractual inflows from assets maturing within 30 days. Similar to outflows, the inflows are calculated based on prescribed factors to various asset categories, such as retail loans as well as unsecured and secured wholesale lending. The minimum LCR requirement is 100%.

The table below details the components of Citi's LCR calculation and HQLA in excess of net outflows for the periods indicated:

In billions of dollars	Dec. 31, 2022	Sept. 30, 2022	Dec. 31, 2021
HQLA	$ 575.2	$ 557.1	$ 554.5
Net outflows	489.0	477.0	482.9
LCR	118 %	117 %	115 %
HQLA in excess of net outflows	$ 86.2	$ 80.1	$ 71.6

Note: The amounts are presented on an average basis.

As of December 31, 2022, Citigroup's average LCR increased, primarily driven by wholesale unsecured debt issuances.

Long-Term Liquidity Measurement: Net Stable Funding Ratio (NSFR)

As previously disclosed, the U.S. banking agencies adopted a rule to assess the availability of a bank's stable funding against a required level.

In general, a bank's available stable funding includes portions of equity, deposits and long-term debt, while its required stable funding will be based on the liquidity characteristics of its assets, derivatives and commitments. Standardized weightings are required to be applied to the various asset and liability classes. The ratio of available stable funding to required stable funding is required to be greater than 100%.

The rule became effective beginning July 1, 2021, while public disclosure requirements to report the ratio will occur on a semiannual basis beginning June 30, 2023. Citi was in compliance with the rule as of December 31, 2022.

Loans

As part of its funding and liquidity objectives, Citi seeks to fund its existing asset base appropriately as well as maintain sufficient liquidity to grow its *PBWM* and *ICG* businesses, including its loan portfolio. Citi maintains a diversified portfolio of loans to its consumer and institutional clients. The table below details the average loans, by business and/or segment, and the total Citigroup end-of-period loans for each of the periods indicated:

In billions of dollars	4Q22	3Q22	4Q21
Personal Banking and Wealth Management			
U.S. Retail banking	$ 37	$ 36	$ 34
U.S. Cards	143	138	128
Global Wealth	150	151	150
Total	$ 330	$ 325	$ 312
Institutional Clients Group			
Services	$ 79	$ 82	$ 77
Banking	194	197	195
Markets	12	12	17
Total	$ 285	$ 291	$ 289
Total *Legacy Franchises*[1]	$ 38	$ 39	$ 66
Total Citigroup loans (AVG)	$ 653	$ 655	$ 667
Total Citigroup loans (EOP)	$ 657	$ 646	$ 668

(1) See footnote 2 to the table in "Credit Risk—Consumer Credit—Consumer Credit Portfolio" above.

End-of-period loans decreased 2% year-over-year, largely driven by lower balances in *Legacy Franchises* and the impact of foreign exchange translation. End-of-period loans increased 2% sequentially.

On an average basis, loans declined 2% year-over-year and were largely unchanged sequentially. The year-over-year decline was primarily due to the impact of foreign exchange translation and lower balances in *Legacy Franchises*, which more than offset growth in *PBWM*. The decline in *Legacy Franchises* primarily reflected the reclassification of loans to *Other assets* to reflect held-for-sale accounting as a result of the signing of sale agreements for consumer franchises, as well as the impact of the ongoing Korea and Russia wind-downs.

Average *PBWM* loans as of the fourth quarter of 2022 increased 6% year-over-year, primarily driven by Branded cards and Retail services.

Average *ICG* loans as of the fourth quarter of 2022 decreased 1% year-over-year, primarily driven by RWA optimization efforts within Banking, which more than offset growth in Services from trade finance in TTS.

Deposits

The table below details the average deposits, by business and/or segment, and the total Citigroup end-of-period deposits for each of the periods indicated:

In billions of dollars	4Q22	3Q22	4Q21
Personal Banking and Wealth Management			
U.S. Personal Banking	$ 111	$ 115	$ 114
Global Wealth	320	313	323
Total	$ 431	$ 428	$ 437
Institutional Clients Group			
TTS	$ 694	$ 664	$ 689
Securities services	129	131	140
Markets and Banking	25	22	23
Total	$ 848	$ 817	$ 852
Legacy Franchises[1]	$ 50	$ 50	$ 74
Corporate/Other	$ 32	$ 21	$ 7
Total Citigroup deposits (AVG)	$ 1,361	$ 1,316	$ 1,370
Total Citigroup deposits (EOP)	$ 1,366	$ 1,306	$ 1,317

(1) See footnote 2 to the table in "Credit Risk—Consumer Credit—Consumer Credit Portfolio" above.

End-of-period deposits increased 4% year-over-year, largely driven by Treasury and trade solutions in *ICG*, partially offset by the impact of foreign exchange translation. End-of-period deposits increased 5% sequentially.

On an average basis, deposits declined 1% year-over-year and increased 3% sequentially. The year-over-year decline primarily reflected the impact of foreign exchange translation and a decline in *Legacy Franchises*, partially offset by growth in *Corporate/Other*. The decline in *Legacy Franchises* was due to the impact of held-for-sale accounting as a result of the signing of sale agreements for consumer franchises, as well as the ongoing Korea and Russia wind-downs. *ICG* average deposits were largely unchanged year-over-year. *PBWM* average deposits decreased 1% year-over-year, driven by modest decreases in both U.S. Personal Banking and Global Wealth. *Corporate/Other* average deposits increased $25 billion year-over-year, due to the issuance of institutional certificates of deposit as Citi continues to diversify its funding profile.

Long-Term Debt

Long-term debt (generally defined as debt with original maturities of one year or more) represents the most significant component of Citi's funding for the Citigroup parent company and Citi's non-bank subsidiaries and is a supplementary source of funding for the bank entities.

Long-term debt is an important funding source due in part to its multiyear contractual maturity structure. The weighted-average maturity of unsecured long-term debt issued by Citigroup and its affiliates (including Citibank) with a remaining life greater than one year was approximately 7.6 years as of December 31, 2022, compared to 8.6 years as of the prior year and 7.8 years as of the prior quarter. The weighted-average maturity is calculated based on the contractual maturity of each security. For securities that are redeemable prior to maturity at the option of the holder, the weighted-average maturity is calculated based on the earliest date an option becomes exercisable.

Citi's long-term debt outstanding at the Citigroup parent company includes benchmark senior and subordinated debt and what Citi refers to as customer-related debt, consisting of structured notes, such as equity- and credit-linked notes, as well as non-structured notes. Citi's issuance of customer-related debt is generally driven by customer demand and complements benchmark debt issuance as a source of funding for Citi's non-bank entities. Citi's long-term debt at the bank includes bank notes, FHLB advances and securitizations.

Long-Term Debt Outstanding

The following table presents Citi's end-of-period total long-term debt outstanding for each of the dates indicated:

In billions of dollars	Dec. 31, 2022	Sept. 30, 2022	Dec. 31, 2021
Non-bank[1]			
Benchmark debt:			
Senior debt	$ 117.5	$ 112.7	$ 117.8
Subordinated debt,	22.5	22.4	25.7
Trust preferred	1.6	1.6	1.7
Customer-related debt	101.1	86.9	78.3
Local country and other[2]	7.8	7.0	7.3
Total non-bank	$ 250.5	$ 230.6	$ 230.8
Bank			
FHLB borrowings	$ 7.3	$ 7.3	$ 5.3
Securitizations[3]	7.6	8.4	9.6
Citibank benchmark senior debt	2.6	2.5	3.6
Local country and other[2]	3.6	4.3	5.1
Total bank	$ 21.1	$ 22.5	$ 23.6
Total long-term debt	$ 271.6	$ 253.1	$ 254.4

Note: Amounts represent the current value of long-term debt on Citi's Consolidated Balance Sheet that, for certain debt instruments, includes consideration of fair value, hedging impacts and unamortized discounts and premiums.

(1) Non-bank includes long-term debt issued to third parties by the parent holding company (Citigroup) and Citi's non-bank subsidiaries (including broker-dealer subsidiaries) that are consolidated into Citigroup. As of December 31, 2022, non-bank included $84.2 billion of long-term debt issued by Citi's broker-dealer and other subsidiaries that are consolidated into Citigroup. Certain Citigroup consolidated hedging activities are also included in this line.

(2) Local country and other includes debt issued by Citi's affiliates in support of their local operations. Within non-bank, certain secured financing is also included.

(3) Predominantly credit card securitizations, primarily backed by Branded cards receivables.

Citi's total long-term debt outstanding increased 7% year-over-year, primarily driven by an increase in customer-related debt at the non-bank entities. Sequentially, long-term debt outstanding also increased 7%, largely driven by an increase in customer-related debt and benchmark senior debt at the non-bank entities.

As part of its liability management, Citi has considered, and may continue to consider, opportunities to redeem or repurchase its long-term debt pursuant to open market purchases, tender offers or other means. Such redemptions and repurchases help reduce Citi's overall funding costs. During 2022, Citi redeemed or repurchased an aggregate of approximately $20.8 billion of its outstanding long-term debt.

Long-Term Debt Issuances and Maturities

The table below details Citi's long-term debt issuances and maturities (including repurchases and redemptions) during the periods presented:

	2022		2021		2020	
In billions of dollars	**Maturities**	**Issuances**	Maturities	Issuances	Maturities	Issuances
Non-bank						
Benchmark debt:						
Senior debt	**$ 15.4**	**$ 27.3**	$ 17.6	$ 15.4	$ 6.5	$ 20.4
Subordinated debt	**0.9**	**—**	—	—	—	—
Trust preferred	**0.1**	**—**	—	—	—	—
Customer-related debt	**27.0**	**65.1**	31.2	48.7	27.7	36.8
Local country and other	**2.8**	**3.5**	3.3	3.6	2.4	1.4
Total non-bank	**$ 46.2**	**$ 95.9**	$ 52.1	$ 67.7	$ 36.6	$ 58.6
Bank						
FHLB borrowings	**$ 5.3**	**$ 7.3**	$ 5.7	$ —	$ 7.5	$ 12.9
Securitizations	**2.1**	**0.2**	6.1	—	4.6	0.3
Citibank benchmark senior debt	**0.9**	**—**	9.8	—	9.8	—
Local country and other	**2.6**	**1.3**	1.2	2.9	4.9	4.6
Total bank	**$ 10.9**	**$ 8.8**	$ 22.8	$ 2.9	$ 26.8	$ 17.8
Total	**$ 57.1**	**$ 104.7**	$ 74.9	$ 70.6	$ 63.4	$ 76.4

The table below shows Citi's aggregate long-term debt maturities (including repurchases and redemptions) in 2022, as well as its aggregate expected remaining long-term debt maturities by year as of December 31, 2022:

	Maturities							
In billions of dollars	**2022**	2023	2024	2025	2026	2027	Thereafter	Total
Non-bank								
Benchmark debt:								
Senior debt	**$ 15.4**	$ 4.9	$ 10.5	$ 11.8	$ 23.4	$ 6.9	$ 60.0	$ 117.5
Subordinated debt	**0.9**	1.2	0.9	4.8	2.3	3.6	9.7	22.5
Trust preferred	**0.1**	—	—	—	—	—	1.6	1.6
Customer-related debt	**27.0**	16.4	20.6	14.0	6.2	9.3	34.6	101.1
Local country and other	**2.8**	2.9	0.4	0.3	0.7	0.2	3.1	7.8
Total non-bank	**$ 46.2**	$ 25.4	$ 32.4	$ 30.9	$ 32.6	$ 20.0	$ 109.0	$ 250.5
Bank								
FHLB borrowings	**$ 5.3**	$ 4.3	$ 3.0	$ —	$ —	$ —	$ —	$ 7.3
Securitizations	**2.1**	2.2	1.3	1.6	—	0.8	1.7	7.6
Citibank benchmark senior debt	**0.9**	—	2.6	—	—	—	—	2.6
Local country and other	**2.6**	0.6	1.2	0.2	0.2	—	1.4	3.6
Total bank	**$ 10.9**	$ 7.1	$ 8.1	$ 1.8	$ 0.2	$ 0.8	$ 3.1	$ 21.1
Total long-term debt	**$ 57.1**	$ 32.5	$ 40.5	$ 32.7	$ 32.8	$ 20.8	$ 112.1	$ 271.6

Resolution Plan

Citigroup is required under Title I of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (Dodd-Frank Act) and the rules promulgated by the FDIC and Federal Reserve Board (FRB) to periodically submit a plan for Citi's rapid and orderly resolution under the U.S. Bankruptcy Code in the event of material financial distress or failure. Citigroup will alternate between submitting a full resolution plan and a targeted resolution plan on a biennial cycle.

On November 22, 2022, the FRB and FDIC issued feedback on the resolution plans filed on July 1, 2021 by the eight U.S. global systemically important banks (GSIBs), including Citigroup. The FRB and FDIC identified one shortcoming, but no deficiencies, in Citigroup's 2021 resolution plan regarding data integrity and data quality management issues. For additional information on Citi's resolution plan submissions, see "Risk Factors—Strategic Risks" above.

Under Citi's preferred "single point of entry" resolution plan strategy, only Citigroup, the parent holding company, would enter into bankruptcy, while Citigroup's material legal entities (as defined in the public section of its 2021 resolution plan, which can be found on the FRB's and FDIC's websites) would remain operational outside of any resolution or insolvency proceedings. Citigroup's resolution plan has been designed to minimize the risk of systemic impact to the U.S. and global financial systems, while maximizing the value of the bankruptcy estate for the benefit of Citigroup's creditors, including its unsecured long-term debt holders.

In addition, in line with the FRB's final total loss-absorbing capacity (TLAC) rule, Citigroup believes it has developed the resolution plan so that Citigroup's shareholders and unsecured creditors—including its unsecured long-term debt holders—bear any losses resulting from Citigroup's bankruptcy. Accordingly, any value realized by holders of its unsecured long-term debt may not be sufficient to repay the amounts owed to such debt holders in the event of a bankruptcy or other resolution proceeding of Citigroup.

The FDIC has also indicated that it was developing a single point of entry strategy to implement the Orderly Liquidation Authority under Title II of the Dodd-Frank Act, which provides the FDIC with the ability to resolve a firm when it is determined that bankruptcy would have serious adverse effects on financial stability in the U.S.

As previously disclosed, in response to feedback received from the FRB and FDIC, Citigroup took the following actions:

(i) Citicorp LLC (Citicorp), an existing wholly owned subsidiary of Citigroup, was established as an intermediate holding company (an IHC) for certain of Citigroup's operating material legal entities;

(ii) Citigroup executed an inter-affiliate agreement with Citicorp, Citigroup's operating material legal entities and certain other affiliated entities pursuant to which Citicorp is required to provide liquidity and capital support to Citigroup's operating material legal entities in the event Citigroup were to enter bankruptcy proceedings (Citi Support Agreement);

(iii) pursuant to the Citi Support Agreement:

- Citigroup made an initial contribution of assets, including certain high-quality liquid assets and inter-affiliate loans (Contributable Assets), to Citicorp, and Citicorp became the business-as-usual funding vehicle for Citigroup's operating material legal entities;
- Citigroup will be obligated to continue to transfer Contributable Assets to Citicorp over time, subject to certain amounts retained by Citigroup to, among other things, meet Citigroup's near-term cash needs;
- in the event of a Citigroup bankruptcy, Citigroup will be required to contribute most of its remaining assets to Citicorp; and

(iv) the obligations of both Citigroup and Citicorp under the Citi Support Agreement, as well as the Contributable Assets, are secured pursuant to a security agreement.

The Citi Support Agreement provides two mechanisms, besides Citicorp's issuing of dividends to Citigroup, pursuant to which Citicorp will be required to transfer cash to Citigroup during business as usual so that Citigroup can fund its debt service as well as other operating needs: (i) one or more funding notes issued by Citicorp to Citigroup and (ii) a committed line of credit under which Citicorp may make loans to Citigroup.

Total Loss-Absorbing Capacity (TLAC)

U.S. GSIBs are required to maintain minimum levels of TLAC and eligible LTD, each set by reference to the GSIB's consolidated risk-weighted assets (RWA) and total leverage exposure. The intended purpose of the requirements is to facilitate the orderly resolution of U.S. GSIBs under the U.S. Bankruptcy Code and Title II of the Dodd-Frank Act. For additional information, including Citi's TLAC and LTD amounts and ratios, see "Capital Resources—Current Regulatory Capital Standards" above.

SECURED FUNDING TRANSACTIONS AND SHORT-TERM BORROWINGS

Citi supplements its primary sources of funding with short-term financings that generally include (i) secured funding transactions consisting of securities loaned or sold under agreements to repurchase, i.e., repos, and (ii) to a lesser extent, short-term borrowings consisting of commercial paper and borrowings from the FHLB and other market participants.

Secured Funding Transactions

Secured funding is primarily accessed through Citi's broker-dealer subsidiaries to fund efficiently both (i) secured lending activity and (ii) a portion of the securities inventory held in the context of market making and customer activities. Citi also executes a smaller portion of its secured funding transactions through its bank entities, which are typically collateralized by government debt securities. Generally, daily changes in the level of Citi's secured funding are primarily due to fluctuations in secured lending activity in the matched book (as described below) and securities inventory.

Secured funding of $202 billion as of December 31, 2022 increased 6% from the prior year and was unchanged sequentially, driven by normal business activity. The average balance for secured funding was approximately $205 billion for the quarter ended December 31, 2022.

The portion of secured funding in the broker-dealer subsidiaries that funds secured lending is commonly referred to as "matched book" activity. The majority of this activity is secured by high-quality liquid securities such as U.S. Treasury securities, U.S. agency securities and foreign government debt securities. Other secured funding is secured by less liquid securities, including equity securities, corporate bonds and asset-backed securities, the tenor of which is generally equal to or longer than the tenor of the corresponding matched book assets.

The remainder of the secured funding activity in the broker-dealer subsidiaries serves to fund securities inventory held in the context of market making and customer activities. To maintain reliable funding under a wide range of market conditions, including under periods of stress, Citi manages these activities by taking into consideration the quality of the underlying collateral and establishing minimum required funding tenors. The weighted average maturity of Citi's secured funding of less liquid securities inventory was greater than 110 days as of December 31, 2022.

Citi manages the risks in its secured funding by conducting daily stress tests to account for changes in capacity, tenor, haircut, collateral profile and client actions. In addition, Citi maintains counterparty diversification by establishing concentration triggers and assessing counterparty reliability and stability under stress. Citi generally sources secured funding from more than 150 counterparties.

Short-Term Borrowings

Citi's short-term borrowings of $47 billion as of the fourth quarter of 2022 increased 68% year-over-year, reflecting an increase in FHLB advances and commercial paper issuance, as Citi continues to diversify its funding profile, and decreased 1% sequentially, driven by normal business activity (see Note 18 for further information on Citigroup's and its affiliates' outstanding short-term borrowings).

CREDIT RATINGS

Citigroup's funding and liquidity, funding capacity, ability to access capital markets and other sources of funds, the cost of these funds and its ability to maintain certain deposits are partially dependent on its credit ratings.

The table below shows the ratings for Citigroup and Citibank as of December 31, 2022. While not included in the table below, the long-term and short-term ratings of Citigroup Global Markets Holding Inc. (CGMHI) were A+/F1 at Fitch Ratings, A2/P-1 at Moody's Investors Service and A/A-1 at S&P Global Ratings as of December 31, 2022.

Ratings as of December 31, 2022

	Citigroup Inc.			Citibank, N.A.		
	Long-term	Short-term	Outlook	Long-term	Short-term	Outlook
Fitch Ratings (Fitch)	A	F1	Stable	A+	F1	Stable
Moody's Investors Service (Moody's)	A3	P-2	Stable	Aa3	P-1	Stable
S&P Global Ratings (S&P)	BBB+	A-2	Stable	A+	A-1	Stable

Potential Impacts of Ratings Downgrades

Ratings downgrades by Fitch, Moody's or S&P could negatively impact Citigroup's and/or Citibank's funding and liquidity due to reduced funding capacity, including derivative triggers, which could take the form of cash obligations and collateral requirements.

The following information is provided for the purpose of analyzing the potential funding and liquidity impact to Citigroup and Citibank of a hypothetical simultaneous ratings downgrade across all three major rating agencies. This analysis is subject to certain estimates, estimation methodologies, judgments and uncertainties. Uncertainties include potential ratings limitations that certain entities may have with respect to permissible counterparties, as well as general subjective counterparty behavior. For example, certain corporate customers and markets counterparties could re-evaluate their business relationships with Citi and limit transactions in certain contracts or market instruments with Citi. Changes in counterparty behavior could impact Citi's funding and liquidity, as well as the results of operations of certain of its businesses. The actual impact to Citigroup or Citibank is unpredictable and may differ materially from the potential funding and liquidity impacts described below. For additional information on the impact of credit rating changes on Citi and its applicable subsidiaries, see "Risk Factors—Liquidity Risks" above.

Citigroup Inc. and Citibank—Potential Derivative Triggers

As of December 31, 2022, Citi estimates that a hypothetical one-notch downgrade of the senior debt/long-term rating of Citigroup Inc. across all three major rating agencies could impact Citigroup's funding and liquidity due to derivative triggers by approximately $0.5 billion, compared to $0.6 billion as of September 30, 2022. Other funding sources, such as secured financing transactions and other margin requirements, for which there are no explicit triggers, could also be adversely affected.

As of December 31, 2022, Citi estimates that a hypothetical one-notch downgrade of the senior debt/long-term rating of Citibank across all three major rating agencies could impact Citibank's funding and liquidity due to derivative triggers by approximately $0.4 billion, compared to $0.8 billion as of September 30, 2022. Other funding sources, such as secured financing transactions and other margin requirements, for which there are no explicit triggers, could also be adversely affected.

In total, as of December 31, 2022, Citi estimates that a one-notch downgrade of Citigroup Inc. and Citibank across all three major rating agencies could result in increased aggregate cash obligations and collateral requirements of approximately $0.9 billion, compared to $1.4 billion as of September 30, 2022 (see also Note 23). As detailed under "High-Quality Liquid Assets (HQLA)" above, Citigroup has various liquidity resources available to its bank and non-bank entities in part as a contingency for the potential events described above.

In addition, a broad range of mitigating actions are currently included in Citigroup's and Citibank's contingency funding plans. For Citigroup, these mitigating factors include, but are not limited to, accessing surplus funding capacity from existing clients, tailoring levels of secured lending and adjusting the size of select trading books and collateralized borrowings at certain Citibank subsidiaries. Mitigating actions available to Citibank include, but are not limited to, selling or financing highly liquid government securities, tailoring levels of secured lending, adjusting the size of select trading assets, reducing loan originations and renewals, raising additional deposits or borrowing from the FHLB or central banks. Citi believes these mitigating actions could substantially reduce the funding and liquidity risk, if any, of the potential downgrades described above.

Citibank—Additional Potential Impacts

In addition to the above derivative triggers, Citi believes that a potential downgrade of Citibank's senior debt/long-term rating across any of the three major rating agencies could also have an adverse impact on the commercial paper/short-term rating of Citibank. Citibank has provided liquidity commitments to consolidated asset-backed commercial paper conduits, primarily in the form of asset purchase agreements. As of December 31, 2022, Citibank had liquidity commitments of approximately $11.0 billion to consolidated asset-backed commercial paper conduits, compared to $9.1 billion as of December 31, 2021 (see Note 22 for additional information).

In addition to the above-referenced liquidity resources of certain Citibank entities, Citibank could reduce the funding and liquidity risk, if any, of the potential downgrades described above through mitigating actions, including repricing or reducing certain commitments to commercial paper conduits. In the event of the potential downgrades described above, Citi believes that certain corporate customers could re-evaluate their deposit relationships with Citibank. This re-evaluation could result in clients adjusting their discretionary deposit levels or changing their depository institution, which could potentially reduce certain deposit levels at Citibank. However, Citi could choose to adjust pricing, offer alternative deposit products to its existing customers or seek to attract deposits from new customers, in addition to the mitigating actions referenced above.

MARKET RISK

OVERVIEW

Market risk is the potential for losses arising from changes in the value of Citi's assets and liabilities resulting from changes in market variables such as interest rates, foreign exchange rates, equity prices, commodity prices and credit spreads, as well as their implied volatilities. Market risk arises from both Citi's trading and non-trading portfolios. For additional information on market risk and market risk management at Citi, see "Risk Factors" above.

Each business is required to establish, with approval from Citi's market risk management, a market risk limit framework for identified risk factors that clearly defines approved risk profiles and is within the parameters of Citi's overall risk appetite. These limits are monitored by the Risk organization, including various regional, legal entity and business Risk Management committees, Citi's country and business Asset & Liability Committees and the Citigroup Risk Management and Asset & Liability Committees. In all cases, the businesses are ultimately responsible for the market risks taken and for remaining within their defined limits.

MARKET RISK OF NON-TRADING PORTFOLIOS

Market risk from non-trading portfolios stems predominantly from the potential impact of changes in interest rates and foreign exchange rates on Citi's net interest income and on Citi's *Accumulated other comprehensive income (loss) (AOCI)* from its investment securities portfolios. Market risk from non-trading portfolios also includes the potential impact of changes in foreign exchange rates on Citi's capital invested in foreign currencies.

Banking Book Interest Rate Risk

For interest rate risk purposes, Citi's non-trading portfolios are referred to as the Banking Book. Management of interest rate risk in the Banking Book is governed by Citi's Non-Trading Market Risk Policy. Management's Asset & Liability Committee (ALCO) establishes Citi's risk appetite and related limits for interest rate risk in the Banking Book, which are subject to approval by Citigroup's Board of Directors. Corporate Treasury is responsible for the day-to-day management of Citi's Banking Book interest rate risk as well as periodically reviewing it with the ALCO. Citi's Banking Book interest rate risk management is also subject to independent oversight from Treasury Risk Management, a second line of defense team reporting to the Treasury Chief Risk Officer.

Changes in interest rates impact Citi's net income, *AOCI* and CET1. These changes primarily affect Citi's Banking Book through net interest income, due to a variety of risk factors, including:

- Differences in timing and amounts of the maturity or repricing of assets, liabilities and off-balance sheet instruments;
- Changes in level and/or shape of interest rate curves;
- Client behavior in response to changes in interest rate (e.g., mortgage prepayments, deposit betas); and
- Changes in maturity of instruments resulting from changes in interest rate environment.

As part of their ongoing activities, Citi's businesses generate interest rate-sensitive positions from their client-facing products, such as loans and deposits. The component of this interest rate risk that can be hedged is transferred via Citi's funds transfer pricing process to Corporate Treasury. Corporate Treasury uses various tools to manage the total interest rate risk position within the established risk appetite and target Citi's desired risk profile, including its investment securities portfolio, company-issued debt and interest rate derivatives.

In addition, Citi uses multiple metrics to measure its Banking Book interest rate risk. Interest Rate Exposure (IRE) is a key metric that analyzes the impact of a range of scenarios on Citi's Banking Book net interest income and certain other interest rate-sensitive income versus a base case. IRE does not represent a forecast of Citi's net interest income.

The scenarios, methodologies and assumptions used in this analysis are periodically evaluated and enhanced in response to changes in the market environment, changes in Citi's balance sheet composition, enhancements in Citi's modeling and other factors.

Since the third quarter of 2022, Citi has employed enhanced IRE methodologies and changes to certain assumptions. The changes included, among other things, assumptions around the projected balance sheet and revisions to the treatment of certain business contributions (notably accrual positions in *ICG*'s Markets businesses). These changes resulted in a higher impact to Citi's net interest income over a 12-month period.

Under the enhanced methodology, Citi utilizes the most recent quarter-end balance sheet, assuming no changes to its composition and size over the forecasted horizon (holding the balance sheet static). The forecasts incorporate expectations and assumptions of deposit pricing, loan spreads and mortgage prepayment behavior implied by the interest rate curves in each scenario. The base case scenario reflects the market implied forward interest rates, and sensitivity scenarios assume instantaneous shocks to the base case. The forecasts do not assume Citi takes any risk-mitigating actions in response to changes in the interest rate environment. Certain interest rates are subject to flooring assumptions in downward rate scenarios. Deposit pricing sensitivities, (i.e., deposit betas), are informed by historical and expected behavior. Actual deposit pricing could differ from the assumptions used in these forecasts.

Citi's IRE analysis primarily reflects the impacts from the following Banking Book assets and liabilities: loans, client deposits, Citi's deposits with other banks, investment securities, long-term debt, any related interest rate hedges and the funds transfer pricing of positions in total trading and credit portfolio VAR. It excludes impacts from any positions that are included in total trading and credit portfolio VAR.

Interest Rate Risk of Investment Portfolios—Impact on *AOCI*

Citi also measures the potential impacts of changes in interest rates on the value of its *AOCI*, which can in turn impact Citi's common equity and tangible common equity. This will impact Citi's CET1 and other regulatory capital ratios. Citi seeks to manage its exposure to changes in the market level of interest rates, while limiting the potential impact on its *AOCI* and regulatory capital position.

AOCI at risk is managed as part of the Company-wide interest rate risk position. *AOCI* at risk considers potential changes in *AOCI* (and the corresponding impact on the CET1 Capital ratio) relative to Citi's capital generation capacity.

The following table presents the 12-month estimated impact to Citi's net interest income, *AOCI* and the CET1 Capital ratio, each assuming an unanticipated parallel instantaneous 100 basis point (bps) increase in interest rates:

In millions of dollars, except as otherwise noted	**Dec. 31, 2022**	Sept. 30, 2022	Dec. 31, 2021
Parallel interest rate shock +100 bps			
Interest rate exposure[1][2]			
U.S. dollar	**$ 186**	$ 677	$ 781
All other currencies	**1,650**	1,483	2,025
Total	**$ 1,836**	$ 2,160	$ 2,806
As a percentage of average interest-earning assets	**0.08 %**	0.10 %	0.12 %
Estimated initial negative impact to *AOCI* (after-tax)[3]	**$ (1,102)**	$ (969)	$ (4,609)
Estimated initial impact on CET1 Capital ratio (bps)	**(10)**	(9)	(30)

(1) Excludes trading book and fair value option banking book portfolios and replaces them with the associated transfer pricing.
(2) IRE as of December 31, 2021 excludes certain IRE methodology enhancements implemented in September 2022, most notably the banking book revisions to the treatment of certain business.
(3) Includes the effect of changes in interest rates on *AOCI* related to investment securities, cash flow hedges and pension liability adjustments.

Citi's balance sheet is asset sensitive (assets reprice faster than liabilities), resulting in higher net interest income in increasing interest rate scenarios. The estimated impact to Citi's net interest income in a 100 bps upward rate shock scenario as of December 31, 2022 decreased quarter-over-quarter and year-over-year, primarily reflecting the net impact of lower expected gains due to U.S. dollar interest rate moves that have already been realized and changes in Citi's balance sheet. At progressively higher interest rate levels, the marginal net interest income benefit is lower, as Citi assumes it will pass on a larger share of rate changes to depositors (i.e., higher betas), further reducing Citi's IRE sensitivity. Currency-specific interest rate changes and balance sheet factors may drive quarter-to-quarter volatility in Citi's estimated IRE.

In a 100 bps upward rate shock scenario, Citi expects that the approximate $1.1 billion initial negative impact to *AOCI* could potentially be offset in shareholders' equity through the expected recovery of the impact on *AOCI* through accretion of Citi's investment portfolio and expected net interest income benefit over a period of approximately four months.

Scenario Analysis

The following table presents the estimated impact to Citi's net interest income, *AOCI* and the CET1 Capital ratio (on a fully implemented basis) under five different scenarios of changes in interest rate for the U.S. dollar and all other currencies in which Citi has invested capital as of December 31, 2022. The 100 bps downward rate scenarios are impacted by the low level of interest rates in several countries and the assumption that market interest rates, as well as rates paid to depositors and charged to borrowers, do not fall below zero (i.e., the "flooring assumption"). The rate scenarios are also impacted by convexity related to mortgage products.

In millions of dollars, except as otherwise noted	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
Overnight rate change (bps)	100	100	—	—	(100)
10-year rate change (bps)	100	—	100	(100)	(100)
Interest rate exposure					
U.S. dollar	$ 186	$ 98	$ 105	$ (121)	$ (322)
All other currencies	1,650	1,426	229	(236)	(1,434)
Total	$ 1,836	$ 1,524	$ 334	$ (357)	$ (1,756)
Estimated initial impact to *AOCI* (after-tax)[(1)]	$ (1,102)	$ (931)	$ (159)	$ 46	$ 1,014
Estimated initial impact to CET1 Capital ratio (bps)	(10)	(8)	(2)	1	10

Note: Each scenario assumes that the rate change will occur instantaneously. Changes in interest rates for maturities between the overnight rate and the 10-year rate are interpolated.

(1) Includes the effect of changes in interest rates on *AOCI* related to investment securities, cash flow hedges and pension liability adjustments.

As shown in the table above, the estimated impact to Citi's net interest income remains larger under Scenario 2 than Scenario 3, as Citi's Banking Book has relatively higher interest rate exposure to the short end of the yield curve. For U.S. dollars, exposure to downward rate shocks is larger in magnitude than to upward rate shocks. This is because of the lower benefit to net interest income from Citi's deposit base at higher rate levels, as well as the prepayment effects on mortgage loans and mortgage-backed securities. For other currencies, exposure to downward rate shocks is smaller in magnitude as a result of Citi's flooring assumption, given low rate levels for certain non-U.S. dollar currencies.

The magnitude of the impact to *AOCI* is greater under Scenario 2 as compared to Scenario 3. This is because the combination of changes to Citi's investment portfolio, partially offset by changes related to Citi's pension liabilities, results in a net position that is more sensitive to rates at shorter- and intermediate-term maturities.

Changes in Foreign Exchange Rates—Impacts on *AOCI* and Capital

As of December 31, 2022, Citi estimates that an unanticipated parallel instantaneous 5% appreciation of the U.S. dollar against all of the other currencies in which Citi has invested capital could reduce Citi's tangible common equity (TCE) by approximately $1.7 billion, or 1.0%, as a result of changes to Citi's CTA in *AOCI*, net of hedges. This impact would be primarily due to changes in the value of the Mexican peso, Euro, Singapore dollar and Indian rupee.

This impact is also before any mitigating actions Citi may take, including ongoing management of its foreign currency translation exposure. Specifically, as currency movements change the value of Citi's net investments in foreign currency-denominated capital, these movements also change the value of Citi's risk-weighted assets denominated in those currencies. This, coupled with Citi's foreign currency hedging strategies, such as foreign currency borrowings, foreign currency forwards and other currency hedging instruments, lessens the impact of foreign currency movements on Citi's CET1 Capital ratio. Changes in these hedging strategies, as well as hedging costs, divestitures and tax impacts, can further affect the actual impact of changes in foreign exchange rates on Citi's capital as compared to an unanticipated parallel shock, as described above.

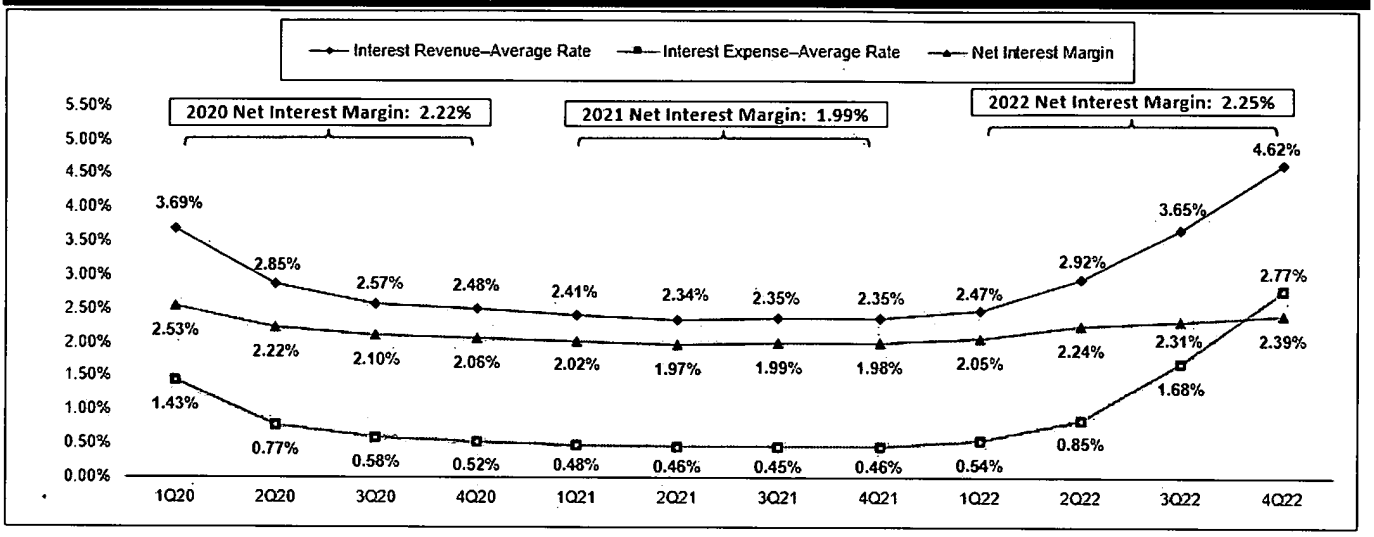
The effect of Citi's ongoing management strategies with respect to quarterly changes in foreign exchange rates, and the quarterly impact of these changes on Citi's TCE and CET1 Capital ratio, are shown in the table below. See Note 20 for additional information on the changes in *AOCI*.

	For the quarter ended		
In millions of dollars, except as otherwise noted	**Dec. 31, 2022**	Sept. 30, 2022	Dec. 31, 2021
Change in FX spot rate[1]	**4.0 %**	(4.5)%	(0.6)%
Change in TCE due to FX translation, net of hedges	$ **1,193**	$ (2,121)	$ (438)
As a percentage of TCE	**0.8 %**	(1.4)%	(0.3)%
Estimated impact to CET1 Capital ratio (on a fully implemented basis) due to changes in FX translation, net of hedges (bps)	**(3)**	(2)	(1)

(1) FX spot rate change is a weighted average based on Citi's quarterly average GAAP capital exposure to foreign countries.

Interest Revenue/Expense and Net Interest Margin (NIM)

Average Rates—Interest Revenue, Interest Expense and Net Interest Margin



In millions of dollars, except as otherwise noted	2022	2021	2020	Change 2022 vs. 2021	Change 2021 vs. 2020
Interest revenue[1]	$ 74,573	$ 50,667	$ 58,285	47 %	(13)%
Interest expense[2]	25,740	7,981	13,338	223	(40)
Net interest income, taxable equivalent basis[1]	$ 48,833	$ 42,686	$ 44,947	14 %	(5)%
Interest revenue—average rate[3]	3.43 %	2.36 %	2.88 %	107 bps	(52) bps
Interest expense—average rate	1.48	0.46	0.81	102 bps	(35) bps
Net interest margin[3][4]	2.25	1.99	2.22	26 bps	(23) bps
Interest rate benchmarks					
Two-year U.S. Treasury note—average rate	2.99 %	0.27 %	0.39 %	272 bps	(12) bps
10-year U.S. Treasury note—average rate	2.95	1.45	0.89	150 bps	56 bps
10-year vs. two-year spread	(4) bps	118 bps	50 bps		

(1) *Interest revenue* and *Net interest income* include the taxable equivalent adjustments primarily related to the tax-exempt bond portfolio and certain tax-advantaged loan programs (based on the U.S. federal statutory tax rate of 21%) of $165 million, $192 million and $196 million for 2022, 2021 and 2020, respectively.

(2) Interest expense associated with certain hybrid financial instruments, which are classified as *Long-term debt* and accounted for at fair value, is reported together with any changes in fair value as part of *Principal transactions* in the Consolidated Statement of Income and is therefore not reflected in *Interest expense* in the table above.

(3) The average rate on interest revenue and net interest margin reflects the taxable equivalent gross-up adjustment. See footnote 1 above.

(4) Citi's NIM is calculated by dividing net interest income by average interest-earning assets.

Non-*ICG* Markets Net Interest Income

In millions of dollars	2022	2021	2020
Net interest income—taxable equivalent basis[1] per above	$ **48,833**	$ 42,686	$ 44,947
ICG Markets net interest income—taxable equivalent basis[1]	**5,173**	5,167	5,208
Non-*ICG* Markets net interest income—taxable equivalent basis[1]	$ **43,660**	$ 37,519	$ 39,739

(1) *Interest revenue* and *Net interest income* include the taxable equivalent adjustments discussed in the table above.

Citi's net interest income in the fourth quarter of 2022 was $13.3 billion (also $13.3 billion on a taxable equivalent basis), an increase of $2.5 billion versus the prior year, primarily driven by non-*ICG* Markets (approximately $2.2 billion), as *ICG* Markets was largely unchanged (up approximately $0.3 billion across fixed income markets and equity markets). The increase in net interest income in non-*ICG* Markets was primarily driven by higher interest rates. Citi's net interest margin was 2.39% on a taxable equivalent basis in the fourth quarter of 2022, an increase of eight basis points from the prior quarter, also largely driven by higher interest rates.

Citi's net interest income for 2022 increased 15%, or approximately $6.2 billion, to $48.7 billion ($48.8 billion on a taxable equivalent basis) versus the prior year. The increase was primarily due to an increase in non-*ICG* Markets net interest income, largely reflecting higher interest rates and higher loan balances in *PBWM*. In 2022, Citi's net interest margin increased to 2.25% on a taxable equivalent basis, compared to 1.99% in 2021, primarily driven by higher interest rates and a mix-shift in balances.

Additional Interest Rate Details

Average Balances and Interest Rates—Assets[1][2][3]

Taxable Equivalent Basis

	Average balance			Interest revenue			% Average rate		
In millions of dollars, except rates	**2022**	2021	2020	**2022**	2021	2020	**2022**	2021	2020
Assets									
Deposits with banks[4]	**$ 262,504**	$ 298,319	$ 288,629	**$ 4,515**	$ 577	$ 928	**1.72 %**	0.19 %	0.32 %
Securities borrowed and purchased under agreements to resell[5]									
In U.S. offices	**$ 188,672**	$ 172,716	$ 149,076	**$ 3,933**	$ 385	$ 1,202	**2.08 %**	0.22 %	0.81 %
In offices outside the U.S.[4]	**164,675**	149,944	138,074	**3,221**	667	1,081	**1.96**	0.44	0.78
Total	**$ 353,347**	$ 322,660	$ 287,150	**$ 7,154**	$ 1,052	$ 2,283	**2.02 %**	0.33 %	0.80 %
Trading account assets[6][7]									
In U.S. offices	**$ 142,146**	$ 140,215	$ 144,130	**$ 4,005**	$ 2,653	$ 3,624	**2.82 %**	1.89 %	2.51 %
In offices outside the U.S.[4]	**132,046**	151,722	134,078	**3,422**	2,718	2,509	**2.59**	1.79	1.87
Total	**$ 274,192**	$ 291,937	$ 278,208	**$ 7,427**	$ 5,371	$ 6,133	**2.71 %**	1.84 %	2.20 %
Investments									
In U.S. offices									
Taxable	**$ 355,012**	$ 322,884	$ 265,833	**$ 5,642**	$ 3,547	$ 3,860	**1.59 %**	1.10 %	1.45 %
Exempt from U.S. income tax	**11,742**	12,296	14,084	**424**	437	452	**3.61**	3.55	3.21
In offices outside the U.S.[4]	**150,968**	152,940	139,400	**5,210**	3,498	3,781	**3.45**	2.29	2.71
Total	**$ 517,722**	$ 488,120	$ 419,317	**$ 11,276**	$ 7,482	$ 8,093	**2.18 %**	1.53 %	1.93 %
Consumer loans[8]									
In U.S. offices	**$ 268,910**	$ 253,184	$ 258,614	**$ 23,127**	$ 19,810	$ 20,436	**8.60 %**	7.82 %	7.90 %
In offices outside the U.S.[4]	**86,497**	121,794	120,974	**5,264**	6,598	7,327	**6.09**	5.42	6.06
Total	**$ 355,407**	$ 374,978	$ 379,588	**$ 28,391**	$ 26,408	$ 27,763	**7.99 %**	7.04 %	7.31 %
Corporate loans[8]									
In U.S. offices	**$ 139,906**	$ 132,957	$ 138,232	**$ 5,417**	$ 4,213	$ 6,264	**3.87 %**	3.17 %	4.53 %
In offices outside the U.S.[4]	**158,008**	160,101	167,405	**7,528**	4,911	6,242	**4.76**	3.07	3.73
Total	**$ 297,914**	$ 293,058	$ 305,637	**$ 12,945**	$ 9,124	$ 12,506	**4.35 %**	3.11 %	4.09 %
Total loans[8]									
In U.S. offices	**$ 408,816**	$ 386,141	$ 396,846	**$ 28,544**	$ 24,023	$ 26,700	**6.98 %**	6.22 %	6.73 %
In offices outside the U.S.[4]	**244,505**	281,895	288,379	**12,792**	11,509	13,569	**5.23**	4.08	4.71
Total	**$ 653,321**	$ 668,036	$ 685,225	**$ 41,336**	$ 35,532	$ 40,269	**6.33 %**	5.32 %	5.88 %
Other interest-earning assets[9]	**$ 112,549**	$ 75,876	$ 67,547	**$ 2,865**	$ 653	$ 579	**2.55 %**	0.86 %	0.86 %
Total interest-earning assets	**$ 2,173,635**	$ 2,144,948	$ 2,026,076	**$ 74,573**	$ 50,667	$ 58,285	**3.43 %**	2.36 %	2.88 %
Non-interest-earning assets[6]	**$ 222,388**	$ 202,761	$ 200,378						
Total assets	**$ 2,396,023**	$ 2,347,709	$ 2,226,454						

(1) *Interest revenue* and *Net interest income* include the taxable equivalent adjustments primarily related to the tax-exempt bond portfolio and certain tax-advantaged loan programs (based on the U.S. federal statutory tax rate of 21%) of $165 million, $192 million and $196 million for 2022, 2021 and 2020, respectively.
(2) Interest rates and amounts include the effects of risk management activities associated with the respective asset categories.
(3) Monthly or quarterly averages have been used by certain subsidiaries where daily averages are unavailable.
(4) Average rates reflect prevailing local interest rates, including inflationary effects and monetary corrections in certain countries.
(5) Average volumes of securities borrowed or purchased under agreements to resell are reported net pursuant to ASC 210-20-45. However, *Interest revenue* excludes the impact of ASC 210-20-45.
(6) The fair value carrying amounts of derivative contracts are reported net, pursuant to ASC 815-10-45, in *Non-interest-earning assets* and *Other non-interest-bearing liabilities*.
(7) *Interest expense* on *Trading account liabilities* of *ICG* is reported as a reduction of *Interest revenue*. *Interest revenue* and *Interest expense* on cash collateral positions are reported in interest on *Trading account assets* and *Trading account liabilities*, respectively.
(8) Net of unearned income. Includes cash-basis loans.
(9) Includes assets from businesses held-for-sale (see Note 2) and *Brokerage receivables*.

Average Balances and Interest Rates—Liabilities and Equity, and Net Interest Income[1][2][3]

Taxable Equivalent Basis

	Average balance			Interest expense			% Average rate		
In millions of dollars, except rates	**2022**	2021	2020	**2022**	2021	2020	**2022**	2021	2020
Liabilities									
Deposits									
In U.S. offices[4]	$ **572,394**	$ 532,466	$ 485,848	$ **5,986**	$ 1,084	$ 2,524	**1.05 %**	0.20 %	0.52 %
In offices outside the U.S.[5]	**516,329**	557,207	541,301	**5,573**	1,812	2,810	**1.08**	0.33	0.52
Total	$ **1,088,723**	$ 1,089,673	$ 1,027,149	$ **11,559**	$ 2,896	$ 5,334	**1.06 %**	0.27 %	0.52 %
Securities loaned and sold under agreements to repurchase[6]									
In U.S. offices	$ **112,771**	$ 136,955	$ 137,348	$ **2,816**	$ 676	$ 1,292	**2.50 %**	0.49 %	0.94 %
In offices outside the U.S.[5]	**94,936**	93,744	79,426	**1,639**	336	785	**1.73**	0.36	0.99
Total	$ **207,707**	$ 230,699	$ 216,774	$ **4,455**	$ 1,012	$ 2,077	**2.14 %**	0.44 %	0.96 %
Trading account liabilities[7][8]									
In U.S. offices	$ **52,166**	$ 47,871	$ 38,308	$ **697**	$ 109	$ 283	**1.34 %**	0.23 %	0.74 %
In offices outside the U.S.[5]	**70,102**	67,739	52,051	**740**	373	345	**1.06**	0.55	0.66
Total	$ **122,268**	$ 115,610	$ 90,359	$ **1,437**	$ 482	$ 628	**1.18 %**	0.42 %	0.70 %
Short-term borrowings and other interest-bearing liabilities[9]									
In U.S. offices	$ **95,054**	$ 69,683	$ 82,363	$ **2,161**	$ (27)	$ 493	**2.27 %**	(0.04)%	0.60 %
In offices outside the U.S.[5]	**55,133**	26,133	20,053	**327**	148	137	**0.59**	0.57	0.68
Total	$ **150,187**	$ 95,816	$ 102,416	$ **2,488**	$ 121	$ 630	**1.66 %**	0.13 %	0.62 %
Long-term debt[10]									
In U.S. offices	$ **166,063**	$ 186,522	$ 213,809	$ **5,625**	$ 3,384	$ 4,656	**3.39 %**	1.81 %	2.18 %
In offices outside the U.S.[5]	**3,592**	4,282	3,918	**176**	86	13	**4.90**	2.01	0.33
Total	$ **169,655**	$ 190,804	$ 217,727	$ **5,801**	$ 3,470	$ 4,669	**3.42 %**	1.82 %	2.14 %
Total interest-bearing liabilities	$ **1,738,540**	$ 1,722,602	$ 1,654,425	$ **25,740**	$ 7,981	$ 13,338	**1.48 %**	0.46 %	0.81 %
Demand deposits in U.S. offices	$ **135,725**	$ 98,414	$ 30,876						
Other non-interest-bearing liabilities[7]	**322,151**	324,643	346,736						
Total liabilities	$ **2,196,416**	$ 2,145,659	$ 2,032,037						
Citigroup stockholders' equity	$ **199,088**	$ 201,360	$ 193,769						
Noncontrolling interests	**519**	690	648						
Total equity	$ **199,607**	$ 202,050	$ 194,417						
Total liabilities and stockholders' equity	$ **2,396,023**	$ 2,347,709	$ 2,226,454						
Net interest income as a percentage of average interest-earning assets[11]									
In U.S. offices	$ **1,272,222**	$ 1,244,182	$ 1,187,077	$ **28,802**	$ 26,404	$ 27,520	**2.26 %**	2.12 %	2.32 %
In offices outside the U.S.[6]	**901,412**	900,766	838,999	**20,031**	16,282	17,427	**2.22**	1.81	2.08
Total	$ **2,173,634**	$ 2,144,948	$ 2,026,076	$ **48,833**	$ 42,686	$ 44,947	**2.25 %**	1.99 %	2.22 %

(1) *Interest revenue* and *Net interest income* include the taxable equivalent adjustments discussed in the table above.
(2) Interest rates and amounts include the effects of risk management activities associated with the respective liability categories.
(3) Monthly or quarterly averages have been used by certain subsidiaries where daily averages are unavailable.
(4) Consists of other time deposits and savings deposits. Savings deposits are made up of insured money market accounts, NOW accounts and other savings deposits.
(5) Average rates reflect prevailing local interest rates, including inflationary effects and monetary corrections in certain countries.
(6) Average volumes of securities sold under agreements to repurchase are reported net pursuant to ASC 210-20-45. However, *Interest expense* excludes the impact of ASC 210-20-45.
(7) The fair value carrying amounts of derivative contracts are reported net, pursuant to ASC 815-10-45, in *Non-interest-earning assets* and *Other non-interest-bearing liabilities*.
(8) *Interest expense* on *Trading account liabilities* of *ICG* is reported as a reduction of *Interest revenue*. *Interest revenue* and *Interest expense* on cash collateral positions are reported in interest on *Trading account assets* and *Trading account liabilities*, respectively.

(9) Includes *Brokerage payables*.
(10) Excludes hybrid financial instruments and beneficial interests in consolidated VIEs that are classified as *Long-term debt*, as the changes in fair value for these obligations are recorded in *Principal transactions*.
(11) Includes allocations for capital and funding costs based on the location of the asset.

Analysis of Changes in Interest Revenue[1][2][3]

	2022 vs. 2021			2021 vs. 2020		
	Increase (decrease) due to change in:			Increase (decrease) due to change in:		
In millions of dollars	Average balance	Average rate	Net change	Average balance	Average rate	Net change
Deposits with banks[3]	$ (77)	$ 4,015	$ 3,938	$ 30	$ (381)	$ (351)
Securities borrowed and purchased under agreements to resell						
In U.S. offices	$ 39	$ 3,509	$ 3,548	$ 166	$ (983)	$ (817)
In offices outside the U.S.[3]	72	2,482	2,554	86	(500)	(414)
Total	$ 111	$ 5,991	$ 6,102	$ 252	$ (1,483)	$ (1,231)
Trading account assets[4]						
In U.S. offices	$ 37	$ 1,315	$ 1,352	$ (96)	$ (875)	$ (971)
In offices outside the U.S.[3]	(388)	1,092	704	320	(111)	209
Total	$ (351)	$ 2,407	$ 2,056	$ 224	$ (986)	$ (762)
Investments[1]						
In U.S. offices	$ 404	$ 1,678	$ 2,082	$ 761	$ (1,089)	$ (328)
In offices outside the U.S.[3]	(46)	1,758	1,712	345	(628)	(283)
Total	$ 358	$ 3,436	$ 3,794	$ 1,106	$ (1,717)	$ (611)
Consumer loans (net of unearned income)[5]						
In U.S. offices	$ 1,277	$ 2,040	$ 3,317	$ (426)	$ (200)	$ (626)
In offices outside the U.S.[3]	(2,078)	744	(1,334)	49	(778)	(729)
Total	$ (801)	$ 2,784	$ 1,983	$ (377)	$ (978)	$ (1,355)
Corporate loans (net of unearned income)[5]						
In U.S. offices	$ 230	$ 974	$ 1,204	$ (231)	$ (1,820)	$ (2,051)
In offices outside the U.S.[3]	(65)	2,682	2,617	(263)	(1,068)	(1,331)
Total	$ 165	$ 3,656	$ 3,821	$ (494)	$ (2,888)	$ (3,382)
Loans (net of unearned income)[5]						
In U.S. offices	$ 1,507	$ 3,014	$ 4,521	$ (706)	$ (1,971)	$ (2,677)
In offices outside the U.S.[3]	(2,143)	3,426	1,283	(299)	(1,761)	(2,060)
Total	$ (636)	$ 6,440	$ 5,804	$ (1,005)	$ (3,732)	$ (4,737)
Other interest-earning assets[6]	$ 438	$ 1,774	$ 2,212	$ 72	$ 2	$ 74
Total interest revenue	$ (157)	$ 24,063	$ 23,906	$ 679	$ (8,297)	$ (7,618)

(1) *Interest revenue* and *Net interest income* include the taxable equivalent adjustments discussed in the table above.
(2) Rate/volume variance is allocated based on the percentage relationship of changes in volume and changes in rate to the total net change.
(3) Changes in average rates reflect changes in prevailing local interest rates, including inflationary effects and monetary corrections in certain countries.
(4) *Interest expense* on *Trading account liabilities* of *ICG* is reported as a reduction of *Interest revenue*. *Interest revenue* and *Interest expense* on cash collateral positions are reported in interest on *Trading account assets* and *Trading account liabilities*, respectively.
(5) Includes cash-basis loans.
(6) Includes *Brokerage receivables*.

Analysis of Changes in Interest Expense and Net Interest Income[1][2][3]

In millions of dollars	2022 vs. 2021 Increase (decrease) due to change in: Average balance	Average rate	Net change	2021 vs. 2020 Increase (decrease) due to change in: Average balance	Average rate	Net change
Deposits						
In U.S. offices	**$ 87**	**$ 4,815**	**$ 4,902**	$ 222	$ (1,661)	$ (1,439)
In offices outside the U.S.[3]	**(142)**	**3,903**	**3,761**	80	(1,078)	(998)
Total	**$ (55)**	**$ 8,718**	**$ 8,663**	$ 302	$ (2,739)	$ (2,437)
Securities loaned and sold under agreements to repurchase						
In U.S. offices	**$ (140)**	**$ 2,280**	**$ 2,140**	$ (4)	$ (612)	$ (616)
In offices outside the U.S.[3]	**4**	**1,299**	**1,303**	122	(571)	(449)
Total	**$ (136)**	**$ 3,579**	**$ 3,443**	$ 118	$ (1,183)	$ (1,065)
Trading account liabilities[4]						
In U.S. offices	**$ 11**	**$ 577**	**$ 588**	$ 58	$ (232)	$ (174)
In offices outside the U.S.[3]	**13**	**354**	**367**	93	(65)	28
Total	**$ 24**	**$ 931**	**$ 955**	$ 151	$ (297)	$ (146)
Short-term borrowings and other interest-bearing liabilities[5]						
In U.S. offices	**$ (6)**	**$ 2,194**	**$ 2,188**	$ (66)	$ (454)	$ (520)
In offices outside the U.S.[3]	**172**	**7**	**179**	37	(26)	11
Total	**$ 166**	**$ 2,201**	**$ 2,367**	$ (29)	$ (480)	$ (509)
Long-term debt						
In U.S. offices	**$ (407)**	**$ 2,648**	**$ 2,241**	$ (551)	$ (721)	$ (1,272)
In offices outside the U.S.[3]	**(16)**	**106**	**90**	1	71	72
Total	**$ (423)**	**$ 2,754**	**$ 2,331**	$ (550)	$ (650)	$ (1,200)
Total interest expense	**$ (424)**	**$ 18,183**	**$ 17,759**	$ (8)	$ (5,349)	$ (5,357)
Net interest income	**$ 267**	**$ 5,880**	**$ 6,147**	$ 687	$ (2,948)	$ (2,261)

(1) *Interest revenue* and *Net interest income* include the taxable equivalent adjustments discussed in the table above.
(2) Rate/volume variance is allocated based on the percentage relationship of changes in volume and changes in rate to the total net change.
(3) Changes in average rates reflect changes in prevailing local interest rates, including inflationary effects and monetary corrections in certain countries.
(4) *Interest expense* on *Trading account liabilities* of *ICG* is reported as a reduction of *Interest revenue*. *Interest revenue* and *Interest expense* on cash collateral positions are reported in interest on *Trading account assets* and *Trading account liabilities*, respectively.
(5) Includes *Brokerage payables*.

Market Risk of Trading Portfolios

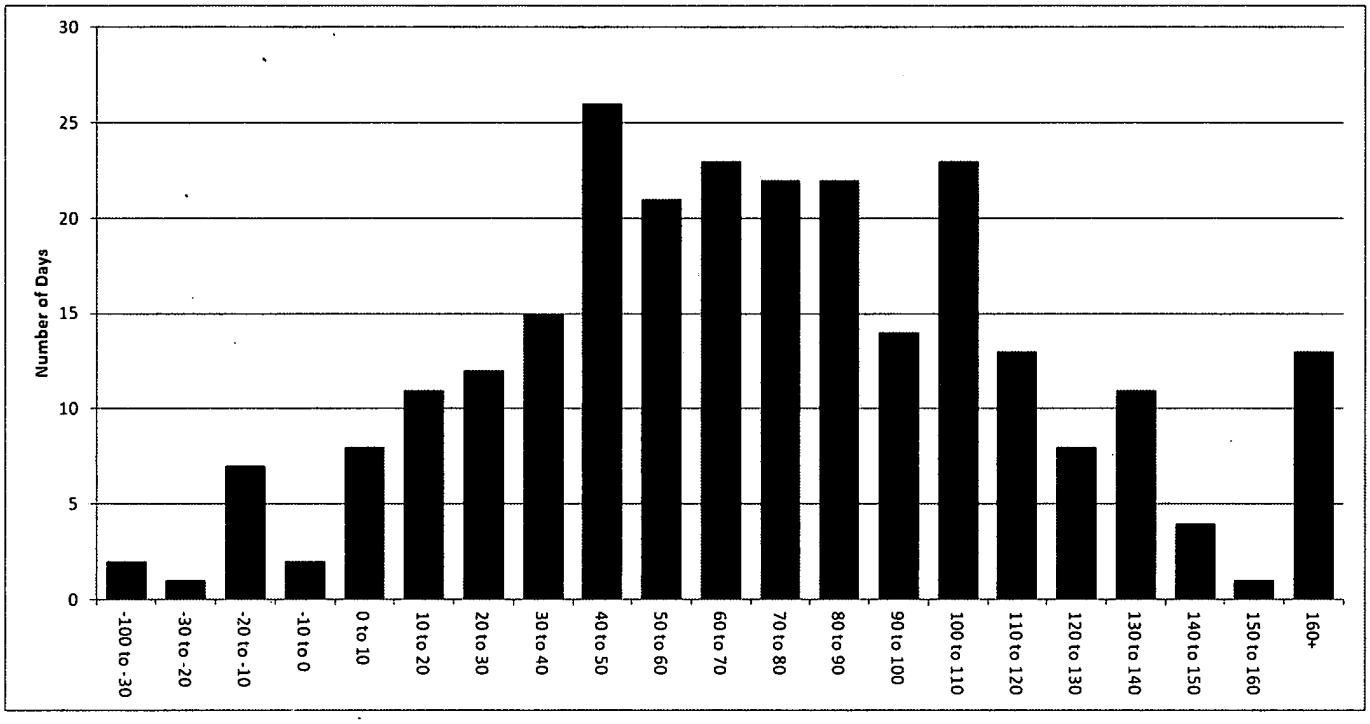
Trading portfolios include positions resulting from market-making activities, hedges of certain available-for-sale (AFS) debt securities, the CVA relating to derivative counterparties and all associated hedges, fair value option loans and hedges of the loan portfolio within capital markets origination in *ICG*.

The market risk of Citi's trading portfolios is monitored using a combination of quantitative and qualitative measures, including, but not limited to, factor sensitivities, value at risk (VAR) and stress testing. Each trading portfolio across Citi's businesses has its own market risk limit framework encompassing these measures and other controls, including trading mandates, new product approval, permitted product lists and pre-trade approval for larger, more complex and less liquid transactions.

The following chart of total daily trading-related revenue (loss) captures trading volatility and shows the number of days in which revenues for Citi's trading businesses fell within particular ranges. Trading-related revenue includes trading, net interest and other revenue associated with Citi's trading businesses. It excludes DVA, FVA and CVA adjustments incurred due to changes in the credit quality of counterparties, as well as any associated hedges of that CVA. In addition, it excludes fees and other revenue associated with capital markets origination activities. Trading-related revenues are driven by both customer flows and the changes in valuation of the trading inventory. As shown in the chart below, positive trading-related revenue was achieved for 95.4% of the trading days in 2022.

Daily Trading-Related Revenue (Loss)(1)—12 Months Ended December 31, 2022

In millions of dollars



(1) Reflects the effects of asymmetrical accounting for economic hedges of certain AFS debt securities. Specifically, the change in the fair value of hedging derivatives is included in trading-related revenue, while the offsetting change in the fair value of hedged AFS debt securities is included in *AOCI* and not reflected above.

Factor Sensitivities

Factor sensitivities are expressed as the change in the value of a position for a defined change in a market risk factor, such as a change in the value of a U.S. Treasury Bond for a one-basis-point change in interest rates. Citi's Global Market Risk function, within the Independent Risk Management organization, works to ensure that factor sensitivities are calculated, monitored and limited for all material risks taken in the trading portfolios.

Value at Risk (VAR)

VAR estimates, at a 99% confidence level, the potential decline in the value of a position or a portfolio under normal market conditions assuming a one-day holding period. VAR statistics, which are based on historical data, can be materially different across firms due to differences in portfolio composition, VAR methodologies and model parameters. As a result, Citi believes VAR statistics can be used more effectively as indicators of trends in risk-taking within a firm, rather than as a basis for inferring differences in risk-taking across firms.

Citi uses a single, independently approved Monte Carlo simulation VAR model (see "VAR Model Review and Validation" below), which has been designed to capture material risk sensitivities (such as first- and second-order sensitivities of positions to changes in market prices) of various asset classes/risk types (such as interest rate, credit spread, foreign exchange, equity and commodity risks). Citi's VAR includes positions that are measured at fair value; it does not include investment securities classified as AFS or HTM. See Note 13 for information on these securities.

Citi believes its VAR model is conservatively calibrated to incorporate fat-tail scaling and the greater of short-term (approximately the most recent month) and long-term (18 months for commodities and three years for others) market volatility. The Monte Carlo simulation involves approximately 550,000 market factors, making use of approximately 480,000 time series, with sensitivities updated daily, volatility parameters updated intra-monthly and correlation parameters updated monthly. The conservative features of the VAR calibration contribute an approximate 46% add-on to what would be a VAR estimated under the assumption of stable and perfectly, normally distributed markets.

As presented in the table below, Citi's average trading VAR increased $22 million from 2021 to 2022, mainly due to increased market volatility. Citi's average trading and credit portfolio VAR increased $23 million from 2021 to 2022 in line with trading VAR.

Year-end and Average Trading VAR and Trading and Credit Portfolio VAR

In millions of dollars	December 31, 2022	2022 Average	December 31, 2021	2021 Average
Interest rate	$ 130	$ 100	$ 50	$ 65
Credit spread	78	74	59	71
Covariance adjustment[1]	(45)	(49)	(35)	(42)
Fully diversified interest rate and credit spread[2]	$ 163	$ 125	$ 74	$ 94
Foreign exchange	20	31	36	42
Equity	27	27	29	33
Commodity	32	41	28	34
Covariance adjustment[1]	(94)	(101)	(88)	(102)
Total trading VAR—all market risk factors, including general and specific risk (excluding credit portfolios)[2]	$ 148	$ 123	$ 79	$ 101
Specific risk-only component[3]	$ (4)	$ (2)	$ 3	$ 1
Total trading VAR—general market risk factors only (excluding credit portfolios)	$ 152	$ 125	$ 76	$ 100
Incremental impact of the credit portfolio[4]	$ 30	$ 31	$ 45	$ 30
Total trading and credit portfolio VAR	$ 178	$ 154	$ 124	$ 131

(1) Covariance adjustment (also known as diversification benefit) equals the difference between the total VAR and the sum of the VARs tied to each risk type. The benefit reflects the fact that the risks within individual and across risk types are not perfectly correlated and, consequently, the total VAR on a given day will be lower than the sum of the VARs relating to each risk type. The determination of the primary drivers of changes to the covariance adjustment is made by an examination of the impact of both model parameter and position changes.

(2) The total trading VAR includes mark-to-market and certain fair value option trading positions in *ICG*, with the exception of hedges to the loan portfolio, fair value option loans and all CVA exposures. Available-for-sale and accrual exposures are not included.

(3) The specific risk-only component represents the level of equity and fixed income issuer-specific risk embedded in VAR.

(4) The credit portfolio is composed of mark-to-market positions associated with non-trading business units, the CVA relating to derivative counterparties and all associated CVA hedges. FVA and DVA are not included. The credit portfolio also includes hedges to the loan portfolio, fair value option loans and hedges to the leveraged finance pipeline within capital markets origination in *ICG*.

The table below provides the range of market factor VARs associated with Citi's total trading VAR, inclusive of specific risk:

	2022		2021	
In millions of dollars	Low	High	Low	High
Interest rate	$ 45	$ 165	$ 47	$ 96
Credit spread	59	108	54	96
Fully diversified interest rate and credit spread	$ 72	$ 183	$ 74	$ 123
Foreign exchange	12	98	33	49
Equity	12	44	21	50
Commodity	27	104	19	55
Total trading	$ 78	$ 168	$ 79	$ 130
Total trading and credit portfolio	110	226	108	166

Note: No covariance adjustment can be inferred from the above table as the high and low for each market factor will be from different close-of-business dates.

The following table provides the VAR for *ICG*, excluding the CVA relating to derivative counterparties, hedges of CVA, fair value option loans and hedges to the loan portfolio:

In millions of dollars	Dec. 31, 2022
Total—all market risk factors, including general and specific risk	$ 150
Average—during year	$ 124
High—during year	166
Low—during year	81

VAR Model Review and Validation

Generally, Citi's VAR review and model validation process entails reviewing the model framework, major assumptions and implementation of the mathematical algorithm. In addition, product-specific back-testing on portfolios is periodically completed as part of the ongoing model performance monitoring process and reviewed with Citi's U.S. banking regulators. Furthermore, Regulatory VAR back-testing (as described below) is performed against buy-and-hold profit and loss on a monthly basis for multiple sub-portfolios across the organization (trading desk level, *ICG* operating segment and Citigroup) and the results are shared with U.S. banking regulators.

Material VAR model and assumption changes must be independently validated within Citi's Independent Risk Management organization. All model changes, including those for the VAR model, are validated by the model validation group within Citi's Model Risk Management. In the event of significant model changes, parallel model runs are undertaken prior to implementation. In addition, significant model and assumption changes are subject to the periodic reviews and approval by Citi's U.S. banking regulators.

Citi uses the same independently validated VAR model for both Regulatory VAR and Risk Management VAR (i.e., total trading and total trading and credit portfolios VARs) and, as such, the model review and validation process for both purposes is as described above.

Regulatory VAR, which is calculated in accordance with Basel III, differs from Risk Management VAR due to the fact that certain positions included in Risk Management VAR are not eligible for market risk treatment in Regulatory VAR. The composition of Risk Management VAR is discussed under "Value at Risk" above. The applicability of the VAR model for positions eligible for market risk treatment under U.S. regulatory capital rules is periodically reviewed and approved by Citi's U.S. banking regulators.

In accordance with Basel III, Regulatory VAR includes all trading book-covered positions and all foreign exchange and commodity exposures. Pursuant to Basel III, Regulatory VAR excludes positions that fail to meet the intent and ability to trade requirements and are therefore classified as non-trading book and categories of exposures that are specifically excluded as covered positions. Regulatory VAR excludes CVA on derivative instruments and DVA on Citi's own fair-value option liabilities. CVA hedges are excluded from Regulatory VAR and included in credit risk-weighted assets as computed under the Advanced Approaches for determining risk-weighted assets.

Regulatory VAR Back-Testing

In accordance with Basel III, Citi is required to perform back-testing to evaluate the effectiveness of its Regulatory VAR model. Regulatory VAR back-testing is the process in which the daily one-day VAR, at a 99% confidence interval, is compared to the buy-and-hold profit and loss (i.e., the profit and loss impact if the portfolio is held constant at the end of the day and re-priced the following day). Buy-and-hold profit and loss represents the daily mark-to-market profit and loss attributable to price movements in covered positions from the close of the previous business day. Buy-and-hold profit and loss excludes realized trading revenue, net interest, fees and commissions, intra-day trading profit and loss and changes in reserves.

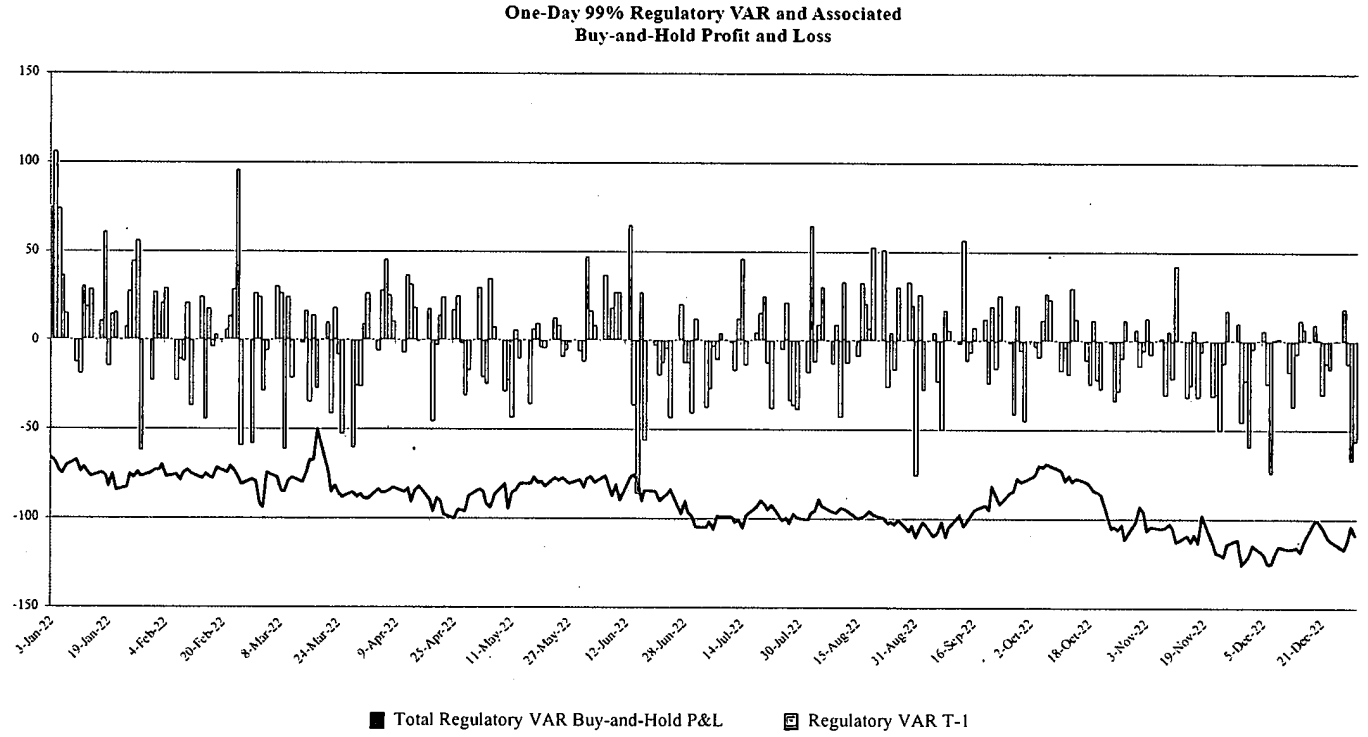
Based on a 99% confidence level, Citi would expect two to three days in any one year where buy-and-hold losses exceed the Regulatory VAR. Given the conservative calibration of Citi's VAR model (as a result of taking the greater of short- and long-term volatilities and fat-tail scaling of volatilities), Citi would expect fewer exceptions under normal and stable market conditions. Periods of unstable market conditions could increase the number of back-testing exceptions.

The following graph shows the daily buy-and-hold profit and loss associated with Citi's covered positions compared to Citi's one-day Regulatory VAR during 2022. During 2022, one back-testing exception was observed at the Citigroup level.

The difference between the 48.3% of days with buy-and-hold gains for Regulatory VAR back-testing and the 95.4% of days with trading, net interest and other revenue associated with Citi's trading businesses, shown in the histogram of daily trading-related revenue below, reflects, among other things, that a significant portion of Citi's trading-related revenue is not generated from daily price movements on these positions and exposures, as well as differences in the portfolio composition of Regulatory VAR and Risk Management VAR.

Regulatory Trading VAR and Associated Buy-and-Hold Profit and Loss[1]—12 Months Ended December 31, 2022

In millions of dollars



(1) Buy-and-hold profit and loss, as defined by the banking regulators under Basel III, represents the daily mark-to-market revenue movement attributable to the trading position from the close of the previous business day. Buy-and-hold profit and loss excludes realized trading revenue and net interest intra-day trading profit and loss on new and terminated trades, as well as changes in reserves. Therefore, it is not comparable to the trading-related revenue presented in the chart of daily trading-related revenue above.

Stress Testing

Citi performs market risk stress testing on a regular basis to estimate the impact of extreme market movements. It is performed on individual positions and trading portfolios, as well as in aggregate, inclusive of multiple trading portfolios. Citi's market risk management, after consultations with the businesses, develops both systemic and specific stress scenarios, reviews the output of periodic stress testing exercises and uses the information to assess the ongoing appropriateness of exposure levels and limits. Citi uses two complementary approaches to market risk stress testing across all major risk factors (i.e., equity, foreign exchange, commodity, interest rate and credit spreads): top-down systemic stresses and bottom-up business-specific stresses. Systemic stresses are designed to quantify the potential impact of extreme market movements on an institution-wide basis, and are constructed using both historical periods of market stress and projections of adverse economic scenarios. Business-specific stresses are designed to probe the risks of particular portfolios and market segments, especially those risks that are not fully captured in VAR and systemic stresses.

The systemic stress scenarios and business-specific stress scenarios at Citi are used in several reports reviewed by senior management and also to calculate internal risk capital for trading market risk. In general, changes in market values are defined over a one-year horizon. For the most liquid positions and market factors, changes in market values are defined over a shorter two-month horizon. The limited set of positions and market factors whose market value changes are defined over a two-month horizon are those that in management's judgment have historically remained very liquid during financial crises, even as the trading liquidity of most other positions and market factors materially declined.

OPERATIONAL RISK

Overview

Operational risk is the risk of loss resulting from inadequate or failed internal processes or systems, including human error or misjudgment, or from external events. This includes legal risk, which is the risk of loss (including litigation costs, settlements and regulatory fines) resulting from the failure of Citi to comply with laws, regulations, prudent ethical standards and contractual obligations in any aspect of its businesses, but excludes strategic and reputation risks. Citi also recognizes the impact of operational risk on the reputation risk associated with Citi's business activities.

Operational risk is inherent in Citi's global business activities, as well as related support functions, and can result in losses. Citi maintains a comprehensive Company-wide risk taxonomy to classify operational risks that it faces using standardized definitions across Citi's Operational Risk Management Framework (see discussion below). This taxonomy also supports regulatory requirements and expectations inclusive of those related to U.S. Basel III, Comprehensive Capital Analysis and Review (CCAR), Heightened Standards for Large Financial Institutions and Dodd-Frank Act Stress Testing (DFAST).

Citi manages operational risk consistent with the overall framework described in "Managing Global Risk—Overview" above. Citi's goal is to keep operational risk at appropriate levels relative to the characteristics of its businesses, the markets in which it operates, its capital and liquidity and the competitive, economic and regulatory environment. This includes effectively managing operational risk and maintaining or reducing operational risk exposures within Citi's operational risk appetite.

Citi's Independent Operational Risk Management group has established a global Operational Risk Management Framework with policies and practices for identification, measurement, monitoring, managing and reporting operational risks and the overall operating effectiveness of the internal control environment. As part of this framework, Citi has defined its operational risk appetite and established a manager's control assessment (MCA) process for self-identification of significant operational risks, assessment of the performance of key controls and mitigation of residual risk above acceptable levels.

Each Citi operating segment must implement operational risk processes consistent with the requirements of this framework. This includes:

- understanding the operational risks they are exposed to;
- designing controls to mitigate identified risks;
- establishing key indicators;
- monitoring and reporting whether the operational risk exposures are in or out of their operational risk appetite;
- having processes in place to bring operational risk exposures within acceptable levels;
- periodically estimating and aggregating the operational risks they are exposed to; and
- ensuring that sufficient resources are available to actively improve the operational risk environment and mitigate emerging risks.

Citi considers operational risks that result from the introduction of new or changes to existing products, or result from significant changes in its organizational structures, systems, processes and personnel.

Citi has a governance structure for the oversight of operational risk exposures through Business Risk and Controls Committees (BRCCs), which include a Citigroup Global BRCC as well as business, functions, regional and country BRCCs. BRCCs provide escalation channels for senior management to review operational risk exposures including breaches of operational risk appetite, key indicators, operational risk events and control issues. Membership includes senior business and functions leadership as well as members of the second line of defense.

In addition, Independent Risk Management, including the Operational Risk Management group, works proactively with Citi's businesses and functions to drive a strong and embedded operational risk management culture and framework across Citi. The Operational Risk Management group actively challenges business and functions implementation of the Operational Risk Management Framework requirements and the quality of operational risk management practices and outcomes.

Information about businesses' key operational risks, historical operational risk losses and the control environment is reported by each major business segment and functional area. Citi's operational risk profile and related information is summarized and reported to senior management, as well as to the Audit and Risk Committees of Citi's Board of Directors by the Head of Operational Risk Management.

Operational risk is measured through Operational Risk Capital and Operational Risk Regulatory Capital for the Advanced Approaches under Basel III. Projected operational risk losses under stress scenarios are estimated as a required part of the FRB's CCAR process.

For additional information on Citi's operational risks, see "Risk Factors—Operational Risk" above.

Cybersecurity Risk

Overview

Cybersecurity risk is the business risk associated with the threat posed by a cyberattack, cyber breach or the failure to protect Citi's most vital business information assets or operations, resulting in a financial or reputational loss (for additional information, see the operational processes and systems and cybersecurity risk factors in "Risk Factors—Operational Risks" above). With an evolving threat landscape, ever-increasing sophistication of threat actor tactics, techniques and procedures, and use of new technologies to conduct financial transactions, Citi and its clients, customers and third parties are and will continue to be at risk from cyberattacks and information security incidents. Citi recognizes the significance of these risks and, therefore, leverages a threat-focused strategy to protect against, detect and respond to, and recover from cyberattacks. Further, Citi actively participates in financial industry, government and cross-sector knowledge-sharing groups to enhance individual and collective cybersecurity preparedness and resilience.

Risk Management

Citi's technology and cybersecurity risk management program is built on three lines of defense. Citi's first line of defense under the Office of the Chief Information Security Officer provides frontline business, operational and technical controls and capabilities to protect against cybersecurity risks, and to respond to cyber incidents and data breaches. Citi manages these threats through state-of-the-art Fusion Centers, which serve as central commands for monitoring and coordinating responses to cyber threats. The enterprise information security team is responsible for infrastructure defense and security controls, performing vulnerability assessments and third-party information security assessments, employee awareness and training programs and security incident management. In each case the team works in coordination with a network of information security officers who are embedded within the businesses and functions globally.

Citi's Operational Risk Management-Technology and Cyber (ORM-T/C) and Independent Compliance Risk Management-Technology and Information Security (ICRM-T) groups serve as the second line of defense, and actively evaluate, anticipate and challenge Citi's risk mitigation practices and capabilities. Citi seeks to proactively identify and remediate technology and cybersecurity risks before they materialize as incidents that negatively affect business operations. Accordingly, the ORM-T/C team independently challenges and monitors capabilities in accordance with Citi's defined Technology and Cyber Risk Appetite statements. To address evolving cybersecurity risks and corresponding regulations, ORM-T/C and ICRM-T teams collectively also monitor cyber legal and regulatory requirements, identify and define emerging risks, execute strategic cyber threat assessments, perform new products and initiative reviews, perform data management risk oversight and conduct cyber risk assurance reviews (inclusive of third-party assessments). In addition, ORM-T/C employs tools and oversees and challenges metrics that are both tailored to cybersecurity and technology and aligned with Citi's overall operational risk management framework to effectively track, identify and manage risk.

Internal audit serves as the third line of defense and independently provides assurance on how effectively the organization as a whole manages cybersecurity risk. Citi also has multiple senior committees such as the Information Security Risk Committee (ISRC), which governs enterprise-level risk tolerance inclusive of cybersecurity risk.

Board Oversight

Citi's Board of Directors and/or one or more Board Committees provides oversight of management's efforts to mitigate cybersecurity risk and respond to cyber incidents. The Board and/or one or more Board Committees receives regular reports on cybersecurity and engages in discussions throughout the year with management and subject-matter experts on the effectiveness of Citi's overall cybersecurity program. The Board and/or one or more Board Committees also obtains updates on Citi's inherent cybersecurity risks and Citi's road map and progress for addressing these risks.

Moreover, Citi's Board and its committee members receive contemporaneous reporting on significant cyber events including response, legal obligations, and outreach and notification to regulators, and customers when needed, as well as guidance to management as appropriate. On an annual basis, the Board's Risk Management Committee approved a standalone Cybersecurity Risk Appetite Statement against which Citi's performance is measured quarterly. For additional information on the Board's oversight of cybersecurity risk management, see Citi's upcoming 2023 Proxy Statement to be filed with the SEC in March 2023.

COMPLIANCE RISK

Compliance risk is the risk to current or projected financial condition and resilience arising from violations of laws, rules, or regulations, or from non-conformance with prescribed practices, internal policies and procedures or ethical standards. Compliance risk exposes Citi to fines, civil money penalties, payment of damages and the voiding of contracts. Compliance risk can result in diminished reputation, harm to Citi's customers, limited business opportunities and lessened expansion potential. It encompasses the risk of noncompliance with all laws and regulations, as well as prudent ethical standards and some contractual obligations. It could also include exposure to litigation (known as legal risk) from all aspects of traditional and non-traditional banking.

Citi seeks to operate with integrity, maintain strong ethical standards and adhere to applicable policies and regulatory and legal requirements. Citi must maintain and execute a proactive Compliance Risk Management (CRM) Framework (as set forth in the CRM Policy) that is designed to manage compliance risk effectively across Citi, with a view to fundamentally strengthen the compliance risk management culture across the lines of defense taking into account Citi's risk governance framework and regulatory requirements. Independent Compliance Risk Management's (ICRM) primary objectives are to:

- Drive and embed a culture of compliance and control throughout Citi;
- Maintain and oversee an integrated CRM Framework that facilitates enterprise-wide compliance with local, national or cross-border laws, rules or regulations, Citi's internal policies, standards and procedures and relevant standards of conduct;
- Assess compliance risks and issues across product lines, functions and geographies, supported by globally consistent systems and compliance risk management processes; and
- Provide compliance risk data aggregation and reporting capabilities.

Citi carries out its objectives and fulfills its responsibilities through the CRM Framework, which is composed of the following integrated key activities, to holistically manage compliance risk:

- Management of Citi's compliance with laws, rules and regulations by identifying and analyzing changes, assessing the impact, and implementing appropriate policies, processes and controls;

- Developing and providing compliance training to ensure colleagues are aware of and understand the key laws, rules and regulations;
- Monitoring the Compliance Risk Appetite, which is articulated through qualitative compliance risk statements describing Citi's appetite for certain types of risk and quantitative measures to monitor the Company's compliance risk exposure;
- Executing Compliance Risk Assessments, the results of which inform Compliance Risk Monitoring and testing of compliance risks and controls in assessing conformance with laws, rules, regulations and internal policies; and
- Issue identification, escalation and remediation to drive accountability, including measurement and reporting of compliance risk metrics against established thresholds in support of the CRM Policy and Compliance Risk Appetite.

To anticipate, control and mitigate compliance risk, Citi has established the CRM Policy to achieve standardization and centralization of methodologies and processes, and to enable more consistent and comprehensive execution of compliance risk management.

Citi has a commitment, as well as an obligation, to identify, assess and mitigate compliance risks associated with its businesses and functions. ICRM is responsible for oversight of Citi's CRM Policy, while all businesses and global control functions are responsible for managing their compliance risks and operating within the Compliance Risk Appetite.

As discussed above, Citi is working to address the FRB and OCC consent orders, which include improvements to Citi's CRM Framework and its enterprise-wide application (for additional information regarding the consent orders, see "Citi's Consent Order Compliance" above).

REPUTATION RISK

Citi's reputation is a vital asset in building trust and Citi is diligent in enhancing and protecting its reputation with its key stakeholders. To support this, Citi has developed a reputation risk framework. Under this framework, Citigroup and Citibank, N.A. have implemented a risk appetite statement and related key indicators to monitor corporate activities and operations relative to Citi's risk appetite. The framework also requires that business segments and regions escalate potential material reputation risks that require review or mitigation through a Reputation Risk Committee or equivalent.

The Reputation Risk Committees, which are composed of Citi's senior executives, govern the process by which material reputation risks are identified, measured, monitored, controlled and reported. The Reputation Risk Committees determine the appropriate actions to be taken in line with risk appetite and regulatory expectations, while promoting a culture of risk awareness and high standards of integrity and ethical behavior across the Company, consistent with Citi's Mission and Value Proposition. The Citigroup Reputation Risk Committee may escalate reputation risks to the Nomination, Governance and Public Affairs Committee or other appropriate committee of the Citigroup Board of Directors.

Every Citi employee is responsible for safeguarding Citi's reputation, guided by Citi's Code of Conduct. Colleagues are expected to exercise sound judgment and common sense in decisions and actions. They are also expected to promptly escalate all issues that present material reputation risk in line with policy.

STRATEGIC RISK

As discussed above, strategic risk is the risk of a sustained impact (not episodic impact) to Citi's core strategic objectives as measured by impacts on anticipated earnings, market capitalization, or capital, arising from external factors affecting the Company's operating environment, as well as the risks associated with defining the strategy and executing the strategy, which are identified, measured and managed as part of the Strategic Risk Framework at the Enterprise Level.

In this context, external factors affecting Citi's operating environment are the economic environment, geopolitical/ political landscape, industry/competitive landscape, societal trends, customer/client behavior, regulatory/legislative environment and trends related to investors/shareholders.

Citi's Executive Management Team is responsible for the development and execution of Citi's strategy. This strategy is translated into forward-looking plans (collectively Citi's Strategic Plan) that are then cascaded across the organization. Citi's Strategic Plan is presented to the Board on an annual basis, and is aligned with risk appetite thresholds and includes a risk assessment as required by internal frameworks. It is also aligned with limit requirements for capital allocation. Governance and oversight of strategic risk is facilitated by internal committees on a group-wide basis as well as strategic committees at the operating segment and regional levels.

Citi works to ensure that strategic risks are adequately considered and addressed across its various risk management activities, and that strategic risks are assessed in the context of Citi's risk appetite. Citi conducts a top-down, bottom-up risk identification process to identify risks, including strategic risks. Business segments undertake a quarterly risk identification process to systematically identify and document all material risks faced by Citi. Independent Risk Management oversees the risk identification process through regular reviews and coordinates identification and monitoring of top risks. In addition, Citi performs a quarterly Risk Assessment of the Plan (RAOP) and continuously monitors risks associated with its execution of strategy. Independent Risk Management also manages strategic risk by monitoring risk appetite thresholds in conjunction with various strategic risk committees, which are part of the governance structure that Citi has in place to manage its strategic risks.

For additional information on Citi's strategic risks, see "Risk Factors—Strategic Risks" above.

Climate Risk

Climate change presents immediate and long-term risks to Citi and its clients and customers, with the risks expected to increase over time. Climate risk refers to the risk of loss arising from climate change and comprises both physical risk and transition risk. Physical risk considers how chronic and acute climate change (e.g., increased storms, drought, fires, floods) can directly damage physical assets (e.g., real estate,

crops) or otherwise impact their value or productivity. Transition risk considers how changes in policy, technology, business practices and market preferences to address climate change (e.g., carbon pricing policies, power generation shifts from fossil fuels to renewable energy) can lead to changes in the value of assets, commodities and companies.

Climate risk is an overarching risk that can act as a driver of other categories of risk, such as credit risk from obligors exposed to high climate risk, strategic risks if Citi fails to consider transition risk in client selection, reputational risk from increased stakeholder concerns about financing high-carbon industries and operational risk from physical risks to Citi's facilities and personnel. Citi's focus on climate risk continues to increase, driven by materiality of strategic, reputational and financial risk considerations. Citi continues to make progress toward embedding these considerations into its overarching risk management approach. For additional information on climate risk, see "Risk Factors—Strategic Risks" above.

Citi reviews factors related to climate risk under its Environmental and Social Risk Management (ESRM) Policy, which includes a focus on climate risk related to financed projects and clients in high-carbon sectors. Considering the credit risk of stranded assets, as well as the reputational risks associated with the coal sector due to its high-carbon emissions, Citi's ESRM Policy includes a prohibition on all project-related financing of new coal-fired power plants and new or expanding thermal coal mines, as well as timetables to reduce financing of companies with high exposure to coal-fired power and coal mining that do not pursue low-carbon transition in the coming years. These sector approaches set clear expectations for clients and help address certain climate risk-driven credit risk concerns while reducing reputation risk.

Citi continues to explore and test methodologies for quantifying how climate risks could impact the individual credit profiles of its clients across various sectors. To assist in embedding climate risk assessments in its credit assessment process, Citi has developed sector-specific climate risk assessments. Such climate risk assessments are designed to supplement publicly available client disclosures and data provided from third-party vendors and facilitate conversations with clients on their most material climate risks and management plans for adaptation and mitigation. Citi's assessments consider sectors that have been identified as higher climate risk by its risk identification process. This will help Citi better understand its clients' businesses and climate-related risks. Citi's Net Zero plan is leading to the further integration of climate risk discussions into client engagement and client selection.

Citi continues to develop globally consistent principles and approaches for managing climate risk across the Company through the implementation of its Climate Risk Management Framework. Through this implementation, climate risk is being embedded into relevant policies and processes over time.

Furthermore, Citi continues to participate in financial industry initiatives and develop and pilot new methodologies and approaches for measuring and assessing the potential financial risks of climate change. Citi also continues to monitor regulatory developments on climate risk and sustainable finance and actively engage with regulators on these topics.

For additional information about sustainability and other ESG matters at Citi, see "Sustainability and Other ESG Matters" above.

OTHER RISKS

LIBOR Transition Risk

As previously disclosed, the LIBOR administrator ceased publication of non-USD LIBOR and one-week and two-month USD LIBOR on a permanent or representative basis on December 31, 2021, with plans for all other USD LIBOR tenors to permanently cease or become non-representative after June 30, 2023. As a result, Citi ceased entering into new contracts referencing USD LIBOR as of January 1, 2022, other than for limited circumstances where regulators recognized that it may be appropriate for banks to enter into new USD LIBOR contracts, including with respect to market-making, hedging or novations of USD transactions executed before January 1, 2022. (For information about risks to Citi from a transition away from and discontinuation of LIBOR or any other benchmark rates, see "Risk Factors—Other Risks" above.)

During 2022, Citi continued its efforts to manage its LIBOR transition risks. Citi has been focused on further reducing its LIBOR exposure and remediating its remaining outstanding LIBOR-linked contracts. In addition, Citi has continued to monitor and engage on legislative, regulatory and other initiatives and developments related to LIBOR transition matters.

As of December 31, 2022, Citi had a USD LIBOR-linked gross notional exposure of approximately $7.1 trillion that matures after the LIBOR cessation date of June 30, 2023, of which approximately $7 trillion relates to derivatives. This derivatives exposure includes (i) bilateral derivatives with a gross notional of approximately $2.5 trillion of which 96% is already remediated through inclusion of ISDA fallbacks and (ii) cleared derivatives with a gross notional of approximately $4.5 trillion that will be covered by the Central Counterparty Clearing House (CCP) conversions planned for the second quarter of 2023.

The remaining gross notional of approximately $0.15 trillion relates to cash products (e.g., loans, debt securities, preferred stock and securitizations), which Citi continues to address through active conversion or insertion of robust contract fallback language or is covered by legislative solutions such as the Adjustable Interest Rate (LIBOR) Act (see the discussion below). Due to rounding, USD LIBOR-linked derivatives and cash products exposure may not sum to total USD LIBOR-linked gross notional exposure.

In the U.S., the LIBOR Act provides for the use of a statutory replacement for the overnight, one-month, three-month, six-month and 12-month tenors of USD LIBOR in all contracts governed by U.S. law that lack adequate fallback provisions. As required by the LIBOR Act, each proposed replacement rate, which differs depending on product type, is based on the Secured Overnight Financing Rate (SOFR). Citi's USD LIBOR-linked securities and contracts that do not have adequate fallbacks as described in the LIBOR Act and

that are governed by U.S. law will fall within the application of the LIBOR Act. As a result, USD LIBOR in these contracts will be replaced with SOFR plus the applicable spread adjustment.

Citi is focused on remediating contracts that reference the USD LIBOR Ice Swap Rate and non-U.S. law contracts, which are not covered by the LIBOR Act. As of December 31, 2022, Citi had a USD LIBOR Ice Swap Rate gross notional exposure of approximately $0.17 trillion. This includes approximately $0.16 trillion of bilateral derivatives, of which 79% has already been remediated through inclusion of ISDA fallbacks, and approximately $0.01 trillion of debt securities that Citi is addressing through its remediation action plans. The USD LIBOR Ice Swap Rate is a separate rate from USD LIBOR and is not included in the USD LIBOR-linked gross notional exposure.

On November 23, 2022, the FCA proposed the publication of one-, three- and six-month USD LIBOR on a synthetic basis through September 2024, which would provide additional time for non-U.S.-law-governed contracts and any contracts that reference the USD LIBOR Ice Swap Rate to be remediated or mature.

Further, Citi continued to engage with regulators, financial accounting bodies and others on LIBOR transition matters. This included participating in a number of working groups, including the Alternative Reference Rates Committee (ARRC) convened by the FRB, to promote and advance development of SOFR and seek to identify and address potential challenges from LIBOR transition.

Citi has also continued to use alternative reference rates in certain newly issued financial instruments. Citi has issued floating rate benchmark and customer-related debt linked to SOFR and originated and arranged loans linked to SOFR. Citi's derivatives contracts are predominantly linked to SOFR and other global alternative reference rates. Citi also provides term SOFR-linked products to clients in accordance with industry best practices and recommendations.

Country Risk

Top 25 Country Exposures

The following table presents Citi's top 25 exposures by country (excluding the U.S.) as of December 31, 2022. (Including the U.S., the total exposure as of December 31, 2022 to the top 25 countries would represent approximately 98% of Citi's exposure to all countries.)

For purposes of the table, loan amounts are reflected in the country where the loan is booked, which is generally based on the domicile of the borrower. For example, a loan to a Chinese subsidiary of a Switzerland-based corporation will generally be categorized as a loan in China. In addition, Citi has developed regional booking centers in certain countries, most significantly in the United Kingdom (U.K.) and Ireland, in order to more efficiently serve its corporate customers. As an example, with respect to the U.K., only 38% of corporate loans presented in the table below are to U.K. domiciled entities (40% for unfunded commitments), with the balance of the loans predominately to European domiciled counterparties. Approximately 90% of the total U.K. funded loans and 89% of the total U.K. unfunded commitments were investment grade as of December 31, 2022.

Trading account assets and investment securities are generally categorized based on the domicile of the issuer of the security of the underlying reference entity. For additional information on the assets included in the table, see the footnotes to the table below.

In billions of dollars	ICG loans	PBWM loans[1]	Legacy Franchises loans	Loans transferred to HFS[7]	Other funded[2]	Unfunded[3]	Net MTM on derivatives/ repos[4]	Total hedges (on loans and CVA)	Investment securities[5]	Trading account assets[6]	Total as of 4Q22	Total as of 3Q22	Total as of 4Q21	Total as a % of Citi as of 4Q22
United Kingdom	$34.1	$ 4.9	$ —	$ —	$ 1.1	$ 38.7	$ 11.2	$ (6.3)	$ 4.9	$ (0.1)	$88.5	$93.0	$ 95.9	5.1 %
Mexico	8.4	0.1	21.9	—	0.3	8.4	2.0	(2.1)	19.3	2.9	61.2	56.3	59.6	3.5
Hong Kong	9.0	19.7	—	—	0.4	6.7	1.7	(1.2)	10.8	1.2	48.3	50.2	50.4	2.8
Ireland	14.6	—	—	—	0.5	31.6	0.2	(0.2)	—	0.7	47.4	50.3	44.5	2.7
Singapore	9.1	18.7	—	—	0.2	6.2	0.9	(0.5)	9.3	1.3	45.2	44.5	45.7	2.6
Brazil	12.2	—	—	—	0.1	3.3	7.0	(1.0)	7.0	0.1	28.7	29.8	27.3	1.6
India	6.3	—	—	3.4	0.8	4.4	1.6	(0.6)	8.6	0.8	25.3	25.6	29.8	1.5
South Korea	3.7	—	8.7	—	0.1	2.1	1.5	(0.9)	8.1	0.4	23.7	22.8	32.0	1.4
Germany	0.5	—	—	—	0.2	6.6	7.7	(4.1)	9.1	2.6	22.6	20.4	19.4	1.3
China	5.2	—	2.9	—	0.8	1.7	1.0	(1.2)	9.1	1.2	20.7	19.1	23.4	1.2
Japan	1.5	—	—	—	—	4.0	3.1	(2.3)	5.1	7.6	19.0	17.9	15.9	1.1
United Arab Emirates	7.2	1.5	—	—	1.0	5.8	0.2	(0.4)	2.1	—	17.4	15.8	14.9	1.0
Jersey	2.4	3.3	—	—	—	10.3	—	(0.1)	—	—	15.9	16.1	17.7	0.9
Poland	3.1	—	1.4	—	—	2.8	0.6	(0.1)	7.3	0.5	15.6	12.5	13.1	0.9
Canada	1.5	1.5	—	—	0.1	6.2	1.7	(1.9)	3.7	2.4	15.2	15.8	14.7	0.9
Australia[8]	8.7	0.4	—	—	—	5.4	0.8	(1.0)	0.8	(0.7)	14.4	14.5	16.4	0.8
Taiwan	4.0	—	—	7.9	0.1	1.2	0.4	(0.1)	0.2	0.1	13.8	14.4	15.3	0.8
Indonesia	1.8	—	—	0.5	—	1.2	1.5	(0.2)	1.0	0.1	5.9	5.6	5.5	0.3
Malaysia	1.4	—	—	—	0.2	0.7	0.1	—	3.1	(0.1)	5.4	8.0	7.8	0.3
Philippines[9]	0.8	—	—	—	0.1	0.2	2.4	—	1.8	(0.3)	5.0	5.3	2.3	0.3
Luxembourg	0.1	0.9	—	—	—	—	0.2	(0.3)	3.7	0.1	4.7	4.4	4.0	0.3
South Africa	1.5	—	—	—	—	0.5	—	(0.2)	2.5	0.1	4.4	4.3	3.8	0.3
Thailand	1.2	—	—	—	—	0.3	0.1	—	2.4	0.2	4.2	7.4	7.9	0.2
Czech Republic	0.7	—	—	—	—	0.9	2.0	—	0.4	—	4.0	3.2	3.5	0.2
Chile	1.0	—	—	—	2.2	0.1	0.1	—	—	—	3.4	3.2	2.5	0.2
Total as a % of Citi's total exposure														**32.2 %**
Total as a % of Citi's non-U.S. total exposure														**93.9 %**

(1) *PBWM* loans reflect funded loans, including those related to the Private bank, net of unearned income. As of December 31, 2022, Private bank loans in the table above totaled $19.8 billion, concentrated in Singapore ($5.2 billion), the U.K. ($4.8 billion) and Hong Kong ($4.1 billion).

(2) Other funded includes other direct exposures such as accounts receivable and investments accounted for under the equity method.

(3) Unfunded exposure includes unfunded corporate lending commitments, letters of credit and other contingencies.

(4) Net mark-to-market (MTM) counterparty risk on OTC derivatives and securities lending/borrowing transactions (repos). Exposures are shown net of collateral and inclusive of CVA. Also includes margin loans.
(5) Investment securities include debt securities available-for-sale, recorded at fair market value, and debt securities held-to-maturity, recorded at amortized cost.
(6) Trading account assets are shown on a net basis and include issuer risk on cash products and derivative exposure where the underlying reference entity/issuer is located in that country.
(7) December 31, 2022, September 30, 2022 and December 31, 2021 include *Legacy Franchises* loans reclassified to HFS as a result of Citi's agreement to sell its consumer banking business in each applicable country. For additional information, see "*Legacy Franchises*" above and Note 2.
(8) December 31, 2021 includes *Legacy Franchises* loans reclassified to HFS as a result of Citi's agreement to sell its consumer banking business in Australia, which closed on June 1, 2022. For additional information, see "*Legacy Franchises*" above and Note 2.
(9) December 31, 2021 includes *Legacy Franchises* loans reclassified to HFS as a result of Citi's agreement to sell its consumer banking business in the Philippines, which closed on August 1, 2022. For additional information, see "*Legacy Franchises*" above and Note 2.

Russia

Introduction

In Russia, Citi has operated through both its *ICG* and *Legacy Franchises* segments. Citi continues to closely monitor the war in Ukraine, related sanctions and economic conditions and continues to mitigate its Russia exposures and risks as appropriate.

As previously disclosed, Citi intends to wind down nearly all of its consumer, local commercial and institutional banking businesses in the country. As a result, Citi has ceased soliciting any new business or new clients in Russia. Citi will continue to manage its existing legal and regulatory commitments and obligations, as well as support its employees, during this period. For additional information, see "Citi's Wind-Down of Its Russia Operations" below.

For additional information about Citi's risks related to its Russia exposures, see "Risk Factors—Market-Related Risk," "—Operational Risks" and "—Other Risks" above.

Impact of Russia's Invasion of Ukraine on Citi's Businesses

Russia-related Balance Sheet Exposures

Citi's domestic operations in Russia are conducted through a subsidiary of Citibank, AO Citibank, which uses the Russian ruble as its functional currency.

The following table summarizes Citi's exposures related to its Russia operations:

In billions of U.S. dollars	December 31, 2022	September 30, 2022	December 31, 2021	Change 4Q22 vs. 3Q22
Loans	$ 0.6	$ 1.6	$ 2.9	$ (1.0)
Investment securities[1]	1.1	1.4	1.5	(0.3)
Net MTM on derivatives/repos[2]	1.4	1.4	0.4	—
Total hedges (on loans and CVA)	(0.1)	(0.1)	(0.1)	—
Unfunded[3]	0.1	0.2	0.7	(0.1)
Trading accounts assets	—	0.1	—	(0.1)
Country risk exposure	**$ 3.1**	**$ 4.6**	**$ 5.4**	**$ (1.5)**
Cash on deposit and placements[4]	2.4	3.0	1.0	(0.6)
National Settlements Depository[5]	1.8	—	—	1.8
Reverse repurchase agreements[2]	—	—	1.8	—
Total third-party exposure[6]	**$ 7.3**	**$ 7.6**	**$ 8.2**	**$ (0.3)**
Additional exposures to Russian counterparties that are not held by the Russian subsidiary	0.2	0.3	1.6	(0.1)
Total Russia exposure[7]	**$ 7.5**	**$ 7.9**	**$ 9.8**	**$ (0.4)**

(1) Investment securities include debt securities available-for-sale (AFS), recorded at fair market value, primarily local government debt securities. There were no impairment losses recognized during the third and fourth quarters of 2022.
(2) Net mark-to-market (MTM) on OTC derivatives and securities lending/borrowing transactions (repos). Effective from 2Q22, reverse repurchase agreements have been shown gross of collateral and reclassified to net MTM on derivatives/repos in the table above, as netting of collateral for Russia-related reverse repurchase agreements was removed. This removal was due to the inability to conclude, with a well-founded basis, the enforceability of contractual rights in the Russian legal system in the event of a counterparty default, given the geopolitical uncertainty caused by the war in Ukraine. As this exposure was already included in Total third-party exposure, the Total Russia exposure was not impacted by this reclassification.
(3) Unfunded exposure consists of unfunded corporate lending commitments, letters of credit and other contingencies.
(4) Cash on deposit and placements are primarily with the Central Bank of Russia.
(5) Represents dividends received by Citi in its role as custodian for investor clients in Russia. Citi is unable to remit these funds to clients due to restrictions imposed by the Russian government.
(6) The majority of AO Citibank's third-party exposures was funded with domestic deposit liabilities from both corporate and personal banking clients.
(7) Citigroup's CTA loss included in its *AOCI* related to its indirect subsidiary, AO Citibank, is excluded from the above table, because the CTA loss is not held in AO Citibank and would be recognized in Citigroup's earnings upon either the substantial liquidation or a loss of control of AO Citibank. Citi has separately described these risks in "Deconsolidation Risk" below.

During the fourth quarter of 2022, Citi continued to reduce its operations in Russia and Russia-related exposures, resulting in a net decrease in total Russia exposure of $0.4 billion, shown in the table above, as well as a change in the composition of its exposure as mitigation efforts have reduced Citi's third-party credit risk. The sequential decline in exposure was driven by a $1.3 billion decrease due to depreciation of the ruble against the U.S. dollar and a $0.9 billion decrease due to loan repayments and sales, partially offset by a $1.8 billion increase in local currency terms, driven by dividends received by Citi as custodian for investor clients in Russia that Citi is unable to remit due to restrictions imposed by the Russian government.

Citi's continued risk mitigation efforts include *ICG* borrower paydowns and limiting extensions of new credit. *ICG*'s credit exposure also reflected a shift to a higher proportion of stronger credit names, including a higher proportion of subsidiaries of multinational companies that are headquartered outside of Russia, primarily in the U.S. and Europe. The decline in overall exposure was also driven by a reduction in exposures to Russian counterparties not held by AO Citibank.

Citi's net investment in Russia was approximately $1.2 billion as of December 31, 2022 (compared to $1.3 billion as of September 30, 2022). The decrease was primarily driven by a $0.2 billion decrease due to depreciation of the ruble against the U.S. dollar, partially offset by an increase of $0.1 billion in retained earnings. A portion of Citi's net investment was hedged for foreign currency depreciation as of December 31, 2022, using forward foreign exchange contracts executed with international peer banks.

Earnings and Other Impacts on Citi's Businesses

Citi's *ICG*, *PBWM* and *Legacy Franchises* segments and *Corporate/Other* have been impacted by various macroeconomic factors and volatilities, including Russia's invasion of Ukraine and its direct and indirect impact on the European and global economies. For a broader discussion of these factors and volatilities on Citi's businesses, see "Executive Summary" and each business's results of operations above.

As of December 31, 2022, Citigroup's ACL included a $0.3 billion remaining credit reserve for Citi's direct and indirect Russian counterparties (down from $0.5 billion at September 30, 2022).

Citi's Wind-Down of Its Russia Operations

In August 2022, Citi disclosed its decision to wind down its Russia consumer and local commercial banking businesses, including actively pursuing portfolio sales. In connection with the wind-down plan, Citi incurred $22 million (excluding the impact from any portfolio sales) of costs in 2022.

In October 2022, Citi announced that it will be ending nearly all of the institutional banking services it offers in Russia by the end of the first quarter of 2023. Going forward, Citi's only operations in Russia will be those necessary to fulfill its remaining legal and regulatory obligations.

On October 28, 2022, Citi entered into an agreement to sell a portfolio of ruble-denominated personal installment loans, totaling approximately $240 million in outstanding loan balances as of the fourth quarter of 2022, to Uralsib, a Russian commercial bank. Citi closed the sale in December 2022 and incurred a pretax net loss of approximately $12 million as a result. In connection with the portfolio sale, Citi also entered into a referral agreement to settle to Uralsib a portfolio of ruble-denominated credit card loans, subject to customer consents. The outstanding card loans balance was approximately $219 million as of the fourth quarter of 2022. Citi will refer credit card customers, who at the customers' sole discretion will be eligible to refinance their outstanding card loan balances with Uralsib.

At this time, Citi expects to incur estimated costs of approximately $190 million in connection with its consumer and institutional wind-down plans in Russia, primarily through 2024 ($80 million in *ICG* and $110 million in *Legacy Franchises*). For additional information, see "*Institutional Clients Group*" and "*Legacy Franchises*" above.

Deconsolidation Risk

Citi's operations in Russia subject it to various risks, including, among others, foreign currency volatility, including appreciations or devaluations; restrictions arising from retaliatory Russian laws and regulations on the conduct of its business; sanctions or asset freezes; or other deconsolidation events (for additional information, see "Risk Factors—Other Risks" above). Examples of triggers that may result in deconsolidation of AO Citibank include voluntary or forced sale of ownership or loss of control due to actions of relevant governmental authorities, including expropriation (i.e., the entity becomes subject to the complete control of a government, court, administrator, trustee or regulator); revocation of banking license; and loss of ability to elect a board of directors or appoint members of senior management. As of December 31, 2022, Citi continued to consolidate AO Citibank because none of the deconsolidation factors were triggered.

In the event of a loss of control of AO Citibank, Citi would be required to (i) write off the net investment of approximately $1.2 billion (compared to $1.3 billion as of September 30, 2022), (ii) recognize a CTA loss of approximately $1.3 billion through earnings (compared to $1.0 billion as of September 30, 2022) and (iii) recognize a loss of $0.5 billion (compared to $0.3 billion as of September 30, 2022) on intercompany liabilities owed by AO Citibank to other Citi entities outside Russia. In the sole event of a substantial liquidation, as opposed to a loss of control, Citi would be required to recognize the CTA loss of approximately $1.3 billion through earnings and would evaluate its remaining net investment as circumstances evolve.

Citi as Paying Agent for Russian-related Clients

Citi serves or served as paying agent on bonds issued by various entities in Russia, including Russian corporate clients. Citi's role as paying agent is administrative. In this role, Citi acts as an agent of its client, the bond issuer, receiving interest and principal payments from the bond issuer and then making payments to international central securities depositories (e.g., Depository Trust Company, Euroclear, Clearstream). The international central securities depositories (ICSDs) make payments to those participants or account holders (e.g., broker/

dealers) that have clients who are investors in the applicable bonds (i.e., bondholders). As a paying agent, Citi generally does not have information about the identity of the bondholders. Citi may be exposed to risks due to its responsibilities for receiving and processing payments on behalf of its clients as a result of sanctions or other governmental requirements and prohibitions. To mitigate operational and sanctions risks, Citi has established policies, procedures and controls for client relationships and payment processing to help ensure compliance with U.S., U.K., EU and other jurisdictions' sanctions laws.

These processes may require Citi to delay or withhold the processing of payments as a result of sanctions on the bond issuer. Citi is also prevented from making payments to accounts on behalf of bondholders should the ICSDs disclose to Citi the presence of sanctioned bondholders. In both instances, Citi is generally required to segregate, restrict or block the funds until applicable sanctions are lifted or the payment is otherwise authorized under applicable law.

Reputational Risks

Citi has continued its efforts to enhance and protect its reputation with its colleagues, clients, customers, investors, regulators and the public. Citi's response to the war in Ukraine, including any action or inaction, may have a negative impact on Citi's reputation with some or all of these parties.

For example, Citi is exposed to reputational risk as a result of its current presence in Russia and association with Russian individuals or entities, whether subject to sanctions or not, including Citi's inability to support its global clients in Russia, which could adversely affect its broader client relationships and businesses; current involvement in transactions or supporting activities involving Russian assets or interests; failure to correctly interpret and apply laws and regulations, including those related to sanctions; perceived misalignment of Citi's actions to its stated strategy in Russia; and the reputational impact from Citi's activity and engagement with Ukraine or with non-Russian clients exiting their Russia businesses. Citi has considered the potential for reputation risk and taken actions to mitigate such risks. Citi established a Russia Special Review Process with management's Reputation Risk Committee with oversight for significant Russia-related reputation risks and completed a number of reputation risk reviews of matters with a Russian nexus.

While Citi announced its intention to wind down its businesses in Russia, Citi will continue to manage those operations during the wind-down process and will be required to maintain certain limited operations to fulfill its remaining legal and regulatory obligations. Also, sanctions and sanctions compliance are highly complex and may change over time and result in increased operational risk. Failure to fully comply with relevant sanctions or the application of sanctions where they should not be applied may negatively impact Citi's reputation. In addition, Citi currently performs services for, conducts business with or deals in non-sanctioned Russian-owned businesses and Russian assets. This has attracted, and will likely continue to attract, negative attention, despite the previously disclosed plan to wind down nearly all its activities in the country, cessation of new business and client originations, and reduction of other exposures.

Citi's continued presence or divestiture of businesses in Russia could also increase its susceptibility to cyberattacks that could negatively impact its relationships with clients and customers, harm its reputation, increase its compliance costs and adversely affect its business operations and results of operations. For additional information on operational and cyber risks, see "Risk Factors—Operational Risk" above.

Board's Role in Overseeing Related Risks

The Citi Board of Directors (Board) and the Board's Risk Management Committee (RMC) and its other Committees have received and continue to receive regular reports from senior management regarding the war in Ukraine and its impact on Citi's operations in Russia, Ukraine and elsewhere, as well as the war's broader geopolitical, macroeconomic and reputational impacts. In addition to receiving regular briefings from management, the full Board has routinely been invited to attend portions of the RMC meetings for discussions related to the war in Ukraine, including with respect to Citi's risk exposures and stress testing. The reports to the Board and its Committees from senior management who represent the impacted businesses and the EMEA region, Independent Risk Management, Finance, Independent Compliance Risk Management, including those individuals responsible for sanctions compliance, and Human Resources, have included detailed information regarding financial impacts, impacts on capital, cybersecurity, strategic considerations, sanctions compliance, employee assistance and reputational risks, enabling the Board and its Committees to properly exercise their oversight responsibilities. In addition, senior management has also provided updates to Citi's Executive Management Team and the Board, outside of formal meetings, regarding Citi's Russia-related risks, including with respect to cybersecurity matters.

Ukraine

Citi has continued to operate in Ukraine throughout the war through its *ICG* businesses, serving the local subsidiaries of multinationals, along with local financial institutions and the public sector. Citi employs approximately 230 people in Ukraine and their safety is Citi's top priority.

All of Citi's domestic operations in Ukraine are conducted through a subsidiary of Citibank, which uses the Ukrainian hryvnia as its functional currency. Citi's exposures in Ukraine are not significant enough to be included in the "Top 25 Country Exposures" table above. As of December 31, 2022, these exposures amounted to $1.0 billion, unchanged from September 30, 2022, and were exclusively composed of third-party assets held on the Citi Ukraine subsidiary.

Argentina

Citi operates in Argentina through its *ICG* businesses. As of December 31, 2022, Citi's net investment in its Argentine operations was approximately $1.7 billion. Under U.S. GAAP, Citi uses the U.S. dollar as the functional currency for its operations in countries that are deemed highly inflationary. Citi uses Argentina's official market exchange rate to remeasure its net Argentine peso-denominated assets into the U.S. dollar. As of December 31, 2022, the official Argentine peso exchange rate against the U.S. dollar was 177.15.

As previously disclosed, the Central Bank of Argentina has continued to maintain certain capital and currency controls that restrict Citi's ability to access U.S. dollars in Argentina and remit earnings from its Argentine operations. As a result, Citi's net investment in its Argentine operations is likely to continue to increase as Citi generates net income in its Argentine franchise and its earnings cannot be remitted.

Due to the currency controls implemented by the Central Bank of Argentina, certain indirect foreign exchange mechanisms have developed that some Argentine entities may use to obtain U.S. dollars, generally at rates that are significantly higher than Argentina's official exchange rate. Citibank Argentina is precluded from accessing these alternative mechanisms, and these exchange mechanisms cannot be used to remeasure Citi's net monetary assets into the U.S. dollar under U.S. GAAP. However, if Argentina's official exchange rate converges with the approximate rate implied by the indirect foreign exchange mechanisms, Citi could incur a loss on its capital in Argentina. Citi cannot predict future fluctuations in Argentina's official market exchange rate or to what extent Citi may be able to access U.S. dollars at the official exchange rate in the future.

Citi economically hedges the foreign currency risk in its net Argentine peso-denominated assets to the extent possible and prudent using non-deliverable forward (NDF) derivative instruments that are primarily executed outside of Argentina. As of December 31, 2022, the international NDF market had very limited liquidity, resulting in Citi's inability to economically hedge its Argentine peso exposure. Accordingly, and to the extent that Citi does not execute NDF contracts for this unhedged exposure in the future, Citi would record devaluations on its net Argentine peso-denominated assets in earnings, without any benefit from a change in the fair value of derivative positions used to economically hedge the exposure.

Citi continually evaluates its economic exposure to its Argentine counterparties and reserves for changes in credit risk and records mark-to-market adjustments for relevant market risks associated with its Argentine assets. Citi believes it has established an appropriate ACL on its Argentine loans, and appropriate fair value adjustments on Argentine assets and liabilities measured at fair value, for credit and sovereign risks under U.S. GAAP as of December 31, 2022. However, U.S. regulatory agencies may require Citi to record additional reserves in the future, increasing *ICG*'s cost of credit, based on the perceived country risk associated with its Argentine exposures.

For additional information on Citi's emerging markets risks, including those related to its Argentine exposures, see "Risk Factors" above.

FFIEC—Cross-Border Claims on Third Parties and Local Country Assets

Citi's cross-border disclosures are presented below, based on the country exposure bank regulatory reporting guidelines of the Federal Financial Institutions Examination Council (FFIEC). The following summarizes some of the key FFIEC reporting guidelines:

- Amounts are based on the domicile of the ultimate obligor, counterparty, collateral (only including qualifying liquid collateral), issuer or guarantor, as applicable (e.g., a security recorded by a Citi U.S. entity but issued by the U.K. government is considered U.K. exposure; a loan recorded by a Citi Mexico entity to a customer domiciled in Mexico where the underlying collateral is held in Germany is considered German exposure).
- Amounts do not consider the benefit of collateral received for secured financing transactions (i.e., repurchase agreements, reverse repurchase agreements and securities loaned and borrowed) and are reported based on notional amounts.
- Netting of derivative receivables and payables, reported at fair value, is permitted, but only under a legally binding netting agreement with the same specific counterparty, and does not include the benefit of margin received or hedges.
- Credit default swaps (CDS) are included based on the gross notional amount sold and purchased and do not include any offsetting CDS on the same underlying entity.
- Loans are reported without the benefit of hedges.

Given the requirements noted above, Citi's FFIEC cross-border exposures and total outstandings tend to fluctuate, in some cases significantly, from period to period. As an example, because total outstandings under FFIEC guidelines do not include the benefit of margin or hedges, market volatility in interest rates, foreign exchange rates and credit spreads may cause significant fluctuations in the level of total outstandings, all else being equal.

The tables below show each country whose total outstandings exceeded 0.75% of total Citigroup assets:

	December 31, 2022									
	Cross-border claims on third parties and local country assets									
In billions of dollars	Banks (a)	Public (a)	NBFIs[1] (a)	Other (corporate and households) (a)	Trading assets[2] (included in (a))	Short-term claims[2] (included in (a))	Total outstanding[3] (sum of (a))	Commitments and guarantees[4]	Credit derivatives purchased[5]	Credit derivatives sold[5]
United Kingdom	$ 4.9	$ 31.7	$ 59.9	$ 16.2	$ 11.4	$ 82.4	$ 112.7	$ 24.3	$ 79.3	$ 77.8
Cayman Islands	—	—	99.8	9.8	6.1	70.3	109.6	18.4	0.2	0.2
Japan	35.4	40.0	17.2	6.9	17.0	71.4	99.5	15.6	13.6	11.9
Germany	4.9	48.3	39.6	6.7	8.3	55.9	99.5	24.1	50.8	48.8
Mexico	2.9	31.1	11.4	29.0	3.9	40.8	74.4	22.0	6.4	5.2
France	9.9	10.9	35.6	7.7	10.3	52.4	64.1	68.8	66.2	62.8
Singapore	2.1	22.6	6.5	16.2	2.3	40.5	47.4	15.7	1.2	1.0
South Korea	4.6	17.7	6.4	15.3	4.2	34.8	44.0	11.2	6.4	5.6
Hong Kong	0.7	14.9	3.5	20.6	4.1	33.7	39.7	13.7	1.5	1.3
China	3.1	18.8	1.9	13.2	8.3	31.2	37.0	5.8	8.9	8.6
Brazil	2.4	14.5	2.8	14.4	5.8	25.1	34.1	3.4	5.5	5.1
India	1.4	13.5	6.7	12.7	2.6	24.2	34.3	8.8	1.4	1.2
Canada	6.6	13.3	7.4	4.0	4.0	23.4	31.3	11.6	6.8	6.8
Australia	3.0	13.2	8.7	3.4	5.7	24.2	28.3	5.0	3.5	3.1
Netherlands	3.9	10.6	5.8	4.6	4.0	19.1	24.9	9.2	31.8	31.0
Switzerland	2.1	13.7	1.1	4.7	2.0	18.5	21.6	8.8	19.4	19.2
Ireland	0.1	3.6	13.0	4.3	2.7	19.8	21.0	6.8	2.7	2.6
Taiwan	0.6	5.6	1.4	12.7	2.2	16.4	20.3	12.9	—	—

	December 31, 2021									
	Cross-border claims on third parties and local country assets									
In billions of dollars	Banks (a)	Public (a)	NBFIs[1] (a)	Other (corporate and households) (a)	Trading assets[2] (included in (a))	Short-term claims[2] (included in (a))	Total outstanding[3] (sum of (a))	Commitments and guarantees[4]	Credit derivatives purchased[5]	Credit derivatives sold[5]
United Kingdom	$ 7.0	$ 31.1	$ 55.6	$ 19.2	$ 16.5	$ 70.8	$ 112.9	$ 23.0	$ 76.3	$ 70.8
Cayman Islands	—	—	78.8	13.2	7.4	56.3	92.0	9.9	0.4	0.3
Japan	31.0	30.1	12.8	8.7	15.6	54.8	82.6	8.4	13.4	12.1
Germany	4.5	48.9	47.7	9.6	18.5	78.3	110.7	23.2	48.6	44.7
Mexico	2.8	28.4	9.3	25.8	2.7	33.4	66.3	19.7	6.7	6.1
France	9.7	9.6	27.0	9.8	14.0	41.6	56.1	85.3	62.6	55.7
Singapore	1.9	18.3	12.1	17.4	2.7	39.1	49.7	16.3	1.4	1.3
South Korea	3.6	17.9	3.2	21.9	2.0	37.7	46.6	12.7	9.0	8.1
Hong Kong	1.3	12.3	3.9	21.8	4.2	30.2	39.3	13.6	1.7	1.5
Australia	3.9	14.2	5.7	12.8	7.3	22.9	36.6	13.6	4.0	3.9
China	4.2	12.9	3.7	14.7	8.0	26.3	35.5	4.4	9.6	9.0
India	1.2	15.0	4.4	13.1	2.6	23.4	33.7	10.2	1.8	1.4
Taiwan	0.5	7.0	1.7	15.8	4.8	21.1	25.0	14.6	—	0.1
Netherlands	5.9	8.8	3.3	5.7	5.2	16.2	23.7	9.8	30.8	27.6
Brazil	2.0	12.9	2.2	12.5	3.9	20.3	29.6	3.2	6.2	5.6
Italy	2.8	10.9	0.9	1.8	8.1	2.4	16.4	1.6	38.8	37.0
Switzerland	1.4	13.7	0.9	6.0	3.1	20.0	22.0	9.7	18.9	17.6
Canada	6.5	12.2	4.7	4.1	3.8	21.0	27.5	12.9	5.7	5.3

(1) Non-bank financial institutions.
(2) Included in total outstanding.
(3) Total outstanding includes cross-border claims on third parties, as well as local country assets. Cross-border claims on third parties include cross-border loans, securities, deposits with banks and other monetary assets, as well as net revaluation gains on foreign exchange and derivative products.
(4) Commitments (not included in total outstanding) include legally binding cross-border letters of credit and other commitments and contingencies as defined by the FFIEC guidelines. The FFIEC definition of commitments includes commitments to local residents to be funded with local currency liabilities originated within the country.
(5) Credit default swaps (CDS) are not included in total outstanding.

SIGNIFICANT ACCOUNTING POLICIES AND SIGNIFICANT ESTIMATES

This section contains a summary of Citi's most significant accounting policies. Note 1 contains a summary of all of Citigroup's significant accounting policies. These policies, as well as estimates made by management, are integral to the presentation of Citi's results of operations and financial condition. While all of these policies require a certain level of management judgment and estimates, this section highlights and discusses the significant accounting policies that require management to make highly difficult, complex or subjective judgments and estimates at times regarding matters that are inherently uncertain and susceptible to change (see also "Risk Factors—Operational Risks" above). Management has discussed each of these significant accounting policies, the related estimates and its judgments with the Audit Committee of the Citigroup Board of Directors.

Valuations of Financial Instruments

Citigroup holds debt and equity securities, derivatives, retained interests in securitizations, investments in private equity and other financial instruments. A substantial portion of these assets and liabilities is reflected at fair value on Citi's Consolidated Balance Sheet as *Trading account assets*, *Available-for-sale securities* and *Trading account liabilities*.

Citi purchases securities under agreements to resell (reverse repos or resale agreements) and sells securities under agreements to repurchase (repos), a substantial portion of which is carried at fair value. In addition, certain loans, short-term borrowings, long-term debt and deposits, as well as certain securities borrowed and loaned positions that are collateralized with cash, are carried at fair value. Citigroup holds its investments, trading assets and liabilities, and resale and repurchase agreements on Citi's Consolidated Balance Sheet to meet customer needs and to manage liquidity needs, interest rate risks and private equity investing.

When available, Citi generally uses quoted market prices to determine fair value and classifies such items within Level 1 of the fair value hierarchy established under ASC 820-10, *Fair Value Measurement*. If quoted market prices are not available, fair value is based on internally developed valuation models that use, where possible, current market-based or independently sourced market parameters, such as interest rates, currency rates and option volatilities. Such models are often based on a discounted cash flow analysis. In addition, items valued using such internally generated valuation techniques are classified according to the lowest level input or value driver that is significant to the valuation. Thus, an item may be classified under the fair value hierarchy as Level 3 even though there may be some significant inputs that are readily observable.

Citi is required to exercise subjective judgments relating to the applicability and functionality of internal valuation models, the significance of inputs or drivers to the valuation of an instrument and the degree of illiquidity and subsequent lack of observability in certain markets. The fair value of these instruments is reported on Citi's Consolidated Balance Sheet with the changes in fair value recognized in either the Consolidated Statement of Income or in *AOCI*.

Losses on available-for-sale securities whose fair values are less than the amortized cost, where Citi intends to sell the security or could more-likely-than-not be required to sell the security prior to recovery, are recognized in earnings. Where Citi does not intend to sell the security nor could more-likely-than-not be required to sell the security, any portion of the loss that is attributable to credit is recognized as an allowance for credit losses with a corresponding provision for credit losses and the remainder of the loss is recognized in *AOCI*. Such losses are capped at the difference between the fair value and amortized cost of the security.

For equity securities carried at cost or under the measurement alternative, decreases in fair value below the carrying value are recognized as impairment in the Consolidated Statement of Income. Moreover, for certain equity method investments, decreases in fair value are only recognized in earnings in the Consolidated Statement of Income if such decreases are judged to be an other-than-temporary impairment (OTTI). Assessing if the fair value impairment is temporary is also inherently judgmental.

The fair value of financial instruments incorporates the effects of Citi's own credit risk and the market view of counterparty credit risk, the quantification of which is also complex and judgmental. For additional information on Citi's fair value analysis, see Notes 1, 6, 25 and 26.

Citi's Allowance for Credit Losses (ACL)

The table below shows Citi's allowance for credit losses on loans (ACLL) and total ACL as of the fourth quarter of 2022. For information on the drivers of Citi's ACL build in the fourth quarter of 2022, see below. For information on refinement in the ACL estimation approach to introduce multiple macroeconomic scenarios to the quantitative component of the ACL, see Note 1. Also see Note 1 for additional information on Citi's accounting policy on accounting for credit losses under ASC Topic 326, *Financial Instruments—Credit losses; Current Expected Credit Losses (CECL)*.

	Allowance for credit losses (ACL)									
	Balance Dec. 31,	Build (release)					2022 FX/	Balance Dec. 31,	ACLL/EOP loans Dec. 31,
In millions of dollars	2021	1Q22	2Q22	3Q22	4Q22	2022	Other[1]	2022	2022[2]
ICG	$ 2,241	$ 596	$ (76)	$ 75	$ (117)	$ 478	$ (4)	$ 2,715	
Legacy Franchises corporate (Mexico SBMM)	174	5	(3)	(34)	(7)	(39)	5	140	
Total corporate ACLL	$ 2,415	$ 601	$ (79)	$ 41	$ (124)	$ 439	$ 1	$ 2,855	1.01 %
U.S. Cards[2]	$ 10,840	$ (1,009)	$ 447	$ 303	$ 814	$ 555	$ (2)	$ 11,393	7.56 %
Retail banking and Global Wealth Management	1,181	(53)	191	57	(43)	152	(3)	1,330	
Total *PBWM*	$ 12,021	$ (1,062)	$ 638	$ 360	$ 771	$ 707	$ (5)	$ 12,723	
Legacy Franchises consumer	2,019	(151)	(25)	40	(54)	(190)	(433)	1,396	
Total consumer ACLL	$ 14,040	$ (1,213)	$ 613	$ 400	$ 717	$ 517	$ (438)	$ 14,119	3.84 %
Total ACLL	$ 16,455	$ (612)	$ 534	$ 441	$ 593	$ 956	$ (437)	$ 16,974	2.60 %
Allowance for credit losses on unfunded lending commitments (ACLUC)	1,871	474	(159)	(71)	47	291	(11)	2,151	
Other[3]	148	(6)	27	83	5	109	(14)	243	
Total ACL	$ 18,474	$ (144)	$ 402	$ 453	$ 645	$ 1,356	$ (462)	$ 19,368	

(1) Includes reclassifications to *Other assets* related to Citi's agreements to sell certain of its consumer banking businesses. See Notes 2 and 15.
(2) As of December 31, 2022, in U.S. Personal Banking, Branded cards ACLL/EOP loans was 6.2% and Retail services ACLL/EOP loans was 10.3%.
(3) Includes ACL on HTM securities and *Other assets*.

Citi's reserves for expected credit losses on funded loans and for unfunded lending commitments, standby letters of credit and financial guarantees are reflected on the Consolidated Balance Sheet in the *Allowance for credit losses on loans* (ACLL) and *Other liabilities* (for Allowance for credit losses on unfunded lending commitments (ACLUC)), respectively. In addition, Citi reserves for expected credit losses on other financial assets carried at amortized cost, including held-to-maturity securities, reverse repurchase agreements, securities borrowed, deposits with banks and other financial receivables. These reserves, together with the ACLL and ACLUC, are referred to as the ACL. Changes in the ACL are reflected as *Provision for credit losses* in the Consolidated Statement of Income for each reporting period. Citi's ability to estimate expected credit losses over the reasonable and supportable (R&S) period is based on the ability to forecast economic activity over an R&S timeframe. The R&S forecast period for consumer and corporate loans is eight quarters.

The ACL is composed of quantitative and qualitative management adjustment components. The quantitative component uses three forward-looking macroeconomic forecast scenarios—base, upside and downside. The qualitative management adjustment component reflects risks and current economic conditions not captured in the quantitative component. Both the quantitative and qualitative components are further discussed below.

Quantitative Component

Citi estimates expected credit losses for its quantitative component using (i) its comprehensive internal data on loss and default history, (ii) internal credit risk ratings, (iii) external credit bureau and rating agencies information and (iv) R&S forecasts of macroeconomic conditions.

For its consumer and corporate portfolios, Citi's expected credit losses are determined primarily by utilizing models that consider the borrowers' probability of default (PD), loss given default (LGD) and exposure at default (EAD). The loss likelihood and severity models used for estimating expected credit losses are sensitive to changes in macroeconomic variables, including housing prices, unemployment and real GDP, and cover a wide range of geographic, industry, product and business segments.

In addition, Citi's models determine expected credit losses based on leading credit indicators, including loan delinquencies, changes in portfolio size, default frequency,

risk ratings and loss recovery rates, as well as other credit trends.

Qualitative Component

The qualitative management adjustment component includes risks not fully captured in the quantitative component, as required by banking supervisory guidance for the ACL, including, but not limited to:

- Concentrations and collateral valuation risk with obligors in the global portfolio
- Emerging macroeconomic risks due to uncertainties related to the war in Ukraine, potential global recession, inflation, interest rates, commodity prices and potential impacts on vulnerable industries and regions
- Normalization of portfolio performance and consumer behavior from record low losses as a result of government stimulus and market liquidity

Citi's qualitative component declined year-over-year, primarily driven by the incorporation of multiple macroeconomic scenarios in the quantitative component and releases of COVID-19–related uncertainty reserves as the portfolio continues to normalize toward pre-pandemic levels and as these risks are captured in the quantitative component of the ACL.

Macroeconomic Variables

Citi considers a multitude of global macroeconomic variables for the base, upside and downside probability-weighted macroeconomic scenario forecasts it uses to estimate the ACL. Citi's forecasts of the U.S. unemployment rate and U.S. real GDP growth rate represent the key macroeconomic variables that most significantly affect its estimate of the ACL.

The tables below show Citi's forecasted quarterly average U.S. unemployment rate and year-over-year U.S. real GDP growth rate used in determining the base macroeconomic forecast for Citi's ACL for each quarterly reporting period from 4Q21 to 4Q22:

	Quarterly average			
U.S. unemployment	1Q23	3Q23	1Q24	8-quarter average[1]
Citi forecast at 4Q21	3.7 %	3.7 %	3.7 %	3.8 %
Citi forecast at 1Q22	3.5	3.5	3.6	3.6
Citi forecast at 2Q22	3.6	3.8	3.9	3.7
Citi forecast at 3Q22	3.8	4.2	4.0	4.0
Citi forecast at 4Q22	3.9	4.5	4.6	4.4

(1) Represents the average unemployment rate for the rolling, forward-looking eight quarters in the forecast horizon.

	Year-over-year growth rate[1]		
	Full year		
U.S. real GDP	2022	2023	2024
Citi forecast at 4Q21	4.0 %	2.2 %	1.8 %
Citi forecast at 1Q22	3.3	2.4	2.1
Citi forecast at 2Q22	2.6	1.8	2.0
Citi forecast at 3Q22	1.6	0.6	1.9
Citi forecast at 4Q22	1.9	0.3	1.5

(1) The year-over-year growth rate is the percentage change in the real (inflation adjusted) GDP level.

Under the base macroeconomic forecast as of 4Q22, U.S. real GDP growth is expected to decline during 2023, and the unemployment rate is expected to increase modestly over the forecast horizon, broadly returning to pre-pandemic levels.

Scenario Weighting

Citi's ACL is estimated using three probability-weighted macroeconomic scenarios—base, upside and downside. The macroeconomic scenario weights are estimated using a statistical model, which, among other factors, takes into consideration key macroeconomic drivers of the ACL, severity of the scenario and other macroeconomic uncertainties and risks. Citi evaluates scenario weights on a quarterly basis.

Citi's downside scenario incorporates more adverse macroeconomic assumptions than the base scenario. For example, compared to the base scenario, Citi's downside scenario reflects a more severe recession, including an elevated average U.S. unemployment rate of 6.9% over the eight-quarter R&S period, with a peak difference of 2.9% in the second quarter of 2024. The downside scenario also reflects a year-over-year U.S. real GDP contraction in 2023 of 2.4%, with a peak quarter-over-quarter difference of 3.3% in the second quarter of 2023.

Citi's ACL is sensitive to the various macroeconomic scenarios that drive the quantitative component of expected credit losses due to changes in the length and severity of forecasted economic variables or events in the respective scenarios. To demonstrate this sensitivity, Citi applied 100% weight to the downside scenario as of December 31, 2022 to reflect the most severe economic deterioration forecast in the multiple macroeconomic scenarios. Citi's downside scenario incorporates more adverse macroeconomic assumptions than the weighted scenario assumptions; therefore, applying a 100% downside scenario weight would result in a hypothetical increase in the ACL of approximately $4.2 billion related to lending exposures, except for loans individually evaluated for credit losses.

This analysis does not incorporate any impacts or changes to the qualitative component of the ACL. These factors could decrease the outcome of the sensitivity analysis based on historical experience and current conditions at the time of the assessment. Given the uncertainty inherent in macroeconomic forecasting, Citi continues to believe that its ACL estimate based on a three probability-weighted macroeconomic scenario approach combined with the qualitative component remains appropriate as of December 31, 2022.

4Q22 Changes in the ACL

As further discussed below, in the fourth quarter of 2022, Citi had an ACL build of $0.7 billion for its consumer portfolios and a release of $0.1 billion for its corporate portfolios, for a net ACL build of $0.6 billion. The build was primarily driven by cards loan growth in consumer portfolios and a deterioration in macroeconomic assumptions (see "Macroeconomic Variables" above), partially offset by reductions in Russia exposures (see "Managing Global Risk—Other Risks—Russia" above). Based on its latest macroeconomic forecast, Citi believes its analysis of the ACL reflects the forward view of the economic environment as of December 31, 2022. See Note 15 for additional information.

Consumer

Citi's consumer ACLL is largely driven by U.S. Cards in U.S. Personal Banking. As discussed above, Citi's total consumer ACLL build was $0.7 billion in the fourth quarter of 2022, primarily driven by U.S. Cards loan growth and a deterioration in macroeconomic assumptions, which increased the ACLL balance to $14.1 billion, or 3.84% of total funded consumer loans.

For U.S. Cards, the level of reserves relative to total funded loans increased to 7.56% as of December 31, 2022, compared to 7.53% at September 30, 2022. For the remaining consumer exposures, the level of reserves relative to total funded loans was 1.3% at December 31, 2022, unchanged from September 30, 2022.

Corporate

Citi had a corporate ACLL release of $0.1 billion in the fourth quarter of 2022. The release was primarily driven by the reduction of direct exposures in Russia, partially offset by the deterioration of macroeconomic assumptions. Including FX/Other, the ACLL reserve balance decreased $93 million to $2.9 billion, or 1.01% of total funded corporate loans.

ACLUC

Citi had an ACLUC build of $47 million in the fourth quarter of 2022, which increased the ACLUC reserve balance, included in *Other liabilities*, to $2.2 billion. The build was primarily driven by a deterioration in macroeconomic assumptions.

ACL on Other Financial Assets

Citi had an ACL build on other financial assets carried at amortized cost of $5 million in the fourth quarter of 2022. Including FX/Other, the ACL reserve balance decreased $13 million to $0.2 billion, included in *Other assets*. See Note 15 for additional information.

ACLL and Non-accrual Ratios

At December 31, 2022, the ratio of the ACLL to total funded loans was 2.60% (3.84% for consumer loans and 1.01% for corporate loans) compared to 2.54% at September 30, 2022 (3.74% for consumer loans and 1.04% for corporate loans).

Citi's total non-accrual loans were $2.4 billion at December 31, 2022, down $447 million from September 30, 2022. Consumer non-accrual loans decreased $84 million to $1.3 billion at December 31, 2022, from $1.4 billion at September 30, 2022, while corporate non-accrual loans decreased $363 million to $1.1 billion at December 31, 2022, from $1.5 billion at September 30, 2022. In addition, the ratio of non-accrual loans to total loans was 0.39% and 0.36% for corporate and consumer loans, respectively, at December 31, 2022 (for additional information on non-accrual loans, see "Additional Consumer and Corporate Credit Details—Non-Accrual Loans and Assets and Renegotiated Loans" above).

Regulatory Capital Impact

Citi elected the modified CECL transition provision for regulatory capital purposes provided by the U.S. banking agencies' final rule. Accordingly, the Day One regulatory capital effects resulting from the adoption of CECL, as well as the ongoing adjustments for 25% of the change in CECL-based allowances in each quarter between January 1, 2020 and December 31, 2021, started to be phased in on January 1, 2022 and will be fully reflected in Citi's regulatory capital as of January 1, 2025.

See Notes 1 and 15 for a further description of the ACL and related accounts.

Goodwill

Citi tests goodwill for impairment annually and conducts interim assessments between annual tests if an event occurs or circumstances change that would more-likely-than-not reduce the fair value of a reporting unit below its carrying amount. These events or circumstances include, among other things, a significant adverse change in the business climate, a decision to sell or dispose of all or a significant portion of a reporting unit or a sustained decrease in Citi's stock price.

Citi had historically performed its annual goodwill impairment test as of July 1 each year. During the quarter ended September 30, 2022, the Company voluntarily changed its annual impairment assessment date from July 1 to October 1. Based on interim impairment tests performed between the previous annual test on July 1, 2021 and the annual test to be performed on October 1, 2022, no more than 12 months have elapsed between goodwill impairment tests of any of Citi's reporting units. The change in measurement date represents a change in method of applying an accounting principle. This change is preferable because it better aligns the Company's goodwill impairment testing procedures with its annual planning process and with its fiscal year-end. Citi continues to monitor each reporting unit for triggering events for purposes of goodwill impairment testing. The change in accounting principle did not result in any delay, acceleration or avoidance of an impairment charge. During the fourth quarter of 2022, the annual test was performed, which resulted in no goodwill impairment as described in Note 16.

As of December 31, 2022, Citigroup's activities were conducted through the *Institutional Clients Group*, *Personal Banking and Wealth Management* and *Legacy Franchises* operating segments and *Corporate/Other*. Goodwill impairment testing is performed at the level below the business segment (referred to as a reporting unit).

Citi utilizes allocated equity as a proxy for the carrying value of its reporting units for purposes of goodwill impairment testing. The allocated equity in the reporting units is determined based on the capital the business would require

if it were operating as a standalone entity, incorporating sufficient capital to be in compliance with both current and expected regulatory capital requirements, including capital for specifically identified goodwill and intangible assets. The capital allocated to the reporting units is incorporated into the annual budget process, which is approved by Citi's Board of Directors.

Goodwill impairment testing involves management judgment, requiring an assessment of whether the carrying value of a reporting unit can be supported by its fair value, using widely accepted valuation techniques, such as the market approach (earnings multiples and/or transaction multiples) and/or the income approach (discounted cash flow (DCF) method). In applying these methodologies, Citi utilizes a number of factors, including actual operating results, future business plans, economic projections and market data. Where applicable, bids from buyers are also utilized to determine fair value.

Similar to 2021, Citi engaged an independent valuation specialist in 2022 to assist in Citi's valuation of all the reporting units, primarily employing both the income and market approach to determine the fair value of the reporting units. Bids from buyers were also used, where available. The resulting fair values were relatively consistent and appropriate weighting was given to outputs from the income and market approach valuations. The income approach utilized discount rates that Citi believes adequately reflected the risk and uncertainty in the financial markets in the internally generated cash flow projections.

The income approach employs a capital asset pricing model in estimating the discount rate. Since none of the Company's reporting units are publicly traded, individual reporting unit fair value determinations cannot be directly correlated to Citigroup's common stock price. The sum of the fair values of the reporting units exceeded the overall market capitalization of Citi as of October 1, 2022. However, Citi believes that it is not meaningful to reconcile the sum of the fair values of the Company's reporting units to its market capitalization due to several factors. The market capitalization of Citigroup reflects the execution risk in a transaction involving Citigroup due to its size. However, the individual reporting units' fair values are not subject to the same level of execution risk nor a business model that is as international. In addition, the market capitalization of Citigroup does not include consideration of the individual reporting unit's control premium.

As discussed in Note 3, effective January 1, 2022, as part of its strategic refresh, Citi made changes to its management structure, which resulted in changes in its operating segments and reporting units to reflect how the CEO, who is the chief operating decision maker, manages the Company, including allocating resources and measuring performance. Goodwill balances were reallocated across the new reporting units based on their relative fair values using the valuation performed as of the effective date of the reorganization. Further, the goodwill balances associated with certain Asia Consumer businesses within the *Legacy Franchises* operating segment were reclassified to HFS as of March 31, 2022. See Note 2 for a discussion of Citi's divestiture activities.

The reorganization of Citi's management structure and the announced sales of businesses within the *Legacy Franchises* operating segment were identified as triggering events for purposes of goodwill impairment testing. Consistent with the requirements of ASC 350, interim goodwill impairment tests were performed that resulted in an impairment of $535 million to the Asia Consumer reporting unit within the *Legacy Franchises* operating segment, due to the implementation of Citi's revised operating segments and reporting units, as well as the timing of mutual execution of sale agreements for certain of the Asia consumer banking businesses. This impairment was recorded in the first quarter of 2022 as an operating expense.

During the second quarter of 2022, Citi's Banking reporting unit within the *ICG* operating segment was negatively impacted by the industry-wide decline in investment banking activity and macroeconomic challenges and uncertainties. These conditions resulted in a corresponding decline in the operating results of the Banking reporting unit as of June 30, 2022, and were identified as a triggering event for purposes of goodwill impairment testing. Consistent with the requirements of ASC 350, an interim goodwill impairment test was performed that resulted in no impairment of the Banking reporting unit within the *ICG* operating segment.

During the third quarter of 2022, Citi's Banking reporting unit within the *ICG* operating segment continued to be negatively impacted by the industry-wide decline in investment banking activity amid ongoing macroeconomic challenges and uncertainties. The presence of these conditions was identified as a triggering event for the purposes of goodwill impairment testing. Consistent with the requirements of ASC 350, an interim goodwill impairment test was performed that resulted in no impairment of the Banking reporting unit.

Also, during the third quarter of 2022, Citi performed an interim goodwill impairment test on the Mexico Consumer/SBMM reporting unit as of July 1, 2022 to satisfy the requirement that no more than 12 months elapse between the tests for all reporting units. The test resulted in no impairment as the fair value of the Mexico Consumer/SBMM reporting unit was greater than its carrying value.

During the fourth quarter of 2022, Citi performed its annual goodwill impairment test as of October 1, 2022, which resulted in no impairment. The result of the impairment test showed that the fair value of Citi's reporting units exceeded their carrying value for all reporting units. The fair value of two reporting units (Banking and Mexico Consumer/SBMM) ranged from 102% to 106% of their carrying values. The carrying values of the Banking and Mexico Consumer/SBMM reporting units included approximately $1.5 billion and $1 billion of goodwill, respectively. The fair values of Citi's other reporting units as a percentage of their carrying values ranged from approximately 111% to 277%.

While the inherent risk related to uncertainty is embedded in the key assumptions used in the valuations of the reporting units, the economic and business environments continue to evolve as Citi's management implements its strategic refresh. If management's future estimates of key economic and market assumptions were to differ from its current assumptions, Citi could potentially experience material goodwill impairment

charges in the future. See Notes 1 and 16 for additional information on goodwill, including the changes in the goodwill balance year-over-year and the segments' goodwill balances as of December 31, 2022.

Litigation Accruals

See the discussion in Note 29 for information regarding Citi's policies on establishing accruals for litigation and regulatory contingencies.

Income Taxes

Overview

Citi is subject to the income tax laws of the U.S., its states and local municipalities and the non-U.S. jurisdictions in which Citi operates. These tax laws are complex and are subject to differing interpretations by the taxpayer and the relevant governmental taxing authorities. Disputes over interpretations of the tax laws may be subject to review and adjudication by the court systems of the various tax jurisdictions or may be settled with the taxing authority upon audit.

In establishing a provision for income tax expense, Citi must make judgments and interpretations about the application of these inherently complex tax laws. Citi must also make estimates about when in the future certain items will affect taxable income in the various tax jurisdictions, both domestic and foreign. Deferred taxes are recorded for the future consequences of events that have been recognized in the financial statements or tax returns, based upon enacted tax laws and rates. Deferred tax assets (DTAs) are recognized subject to management's judgment that realization is more-likely-than-not. For example, if it is more-likely-than-not that a carry-forward would expire unused, Citi would set up a valuation allowance (VA) against that DTA. Citi has established valuation allowances as described below.

As a result of the Tax Cuts and Jobs Act (Tax Reform), beginning in 2018, Citi is taxed on income generated by its U.S. operations at a federal tax rate of 21%. The effect on Citi's state tax rate is dependent upon how and when the individual states that have not yet addressed the federal tax law changes choose to adopt the various new provisions of the U.S. Internal Revenue Code.

Citi's non-U.S. branches and subsidiaries are subject to tax at their local tax rates. Non-U.S. branches also continue to be subject to U.S. taxation. The impact of this on Citi's earnings depends on the level of branch pretax income, the local branch tax rate and allocations of overall domestic loss (ODL) and expenses for U.S. tax purposes to branch earnings. Citi expects no residual U.S. tax on such earnings. With respect to non-U.S. subsidiaries, dividends from these subsidiaries are excluded from U.S. taxation. While the majority of Citi's non-U.S. subsidiary earnings are classified as Global Intangible Low Taxed Income (GILTI), Citi expects no material residual U.S. tax on such earnings based on its non-U.S. subsidiaries' local tax rates, which exceed, on average, the GILTI tax rate. Finally, Citi does not expect the Base Erosion Anti-Abuse Tax (BEAT) to affect its tax provision.

On January 4, 2022, final foreign tax credit (FTC) regulations were published in the Federal Register. These regulations eliminate the creditability of foreign taxes paid in certain situations. These include countries that do not align with U.S. tax principles in significant part and for services performed outside the recipient country. The impact on Citi's 2022 effective tax rate was not material.

The Inflation Reduction Act, signed into law on August 16, 2022, had no impact on Citi's 2022 results. The Act includes a new corporate alternative minimum tax (AMT) and a 1% excise tax on stock buybacks, both effective January 1, 2023. The corporate AMT is a 15% minimum tax on financial statement income after adjusting for foreign taxes paid. Corporate AMT paid in one year is creditable against regular corporate tax liability in future years. Citi does not expect to pay material amounts of corporate AMT given its profitability and tax profile.

The 1% excise tax is a non-deductible tax on the fair market value of stock repurchased in the taxable year, reduced by the fair market value of any stock issued in the same year, and is accounted for in equity.

Deferred Tax Assets and Valuation Allowances (VA)

At December 31, 2022, Citi had net DTAs of $27.7 billion. In the fourth quarter of 2022, Citi's DTAs increased by $0.6 billion, primarily as a result of losses in *Other comprehensive income*. On a full-year basis, Citi's DTAs increased by $2.9 billion from $24.8 billion at December 31, 2021.

Of Citi's total net DTAs of $27.7 billion as of December 31, 2022, $10.9 billion, primarily related to tax carry-forwards, was deducted in calculating Citi's regulatory capital. Net DTAs arising from temporary differences are deducted from regulatory capital if in excess of the 10%/15% limitations (see "Capital Resources" above). For the quarter and year ended December 31, 2022, Citi had $0.3 billion of disallowed temporary difference DTAs (included in the $10.9 billion above). The remaining $16.8 billion of net DTAs as of December 31, 2022 was not deducted in calculating regulatory capital pursuant to Basel III standards, and was appropriately risk weighted under those rules.

Citi's total VA at December 31, 2022 was $2.4 billion, a decrease of $1.8 billion from $4.2 billion at December 31, 2021. The decrease was primarily driven by a release of the remaining general basket FTC VA and expirations in the FTC branch basket. Citi's VA of $2.4 billion is composed of $0.9 billion on its FTC branch basket carry-forwards, $1.0 billion on its U.S. residual DTA related to its non-U.S. branches, $0.4 billion on local non-U.S. DTAs and $0.1 billion on state net operating loss carry-forwards.

As stated above with regard to the impact of non-U.S. branches on Citi's earnings, the level of branch pretax income, the local branch tax rate and the allocations of ODL and expenses for U.S. tax purposes to the branch basket are the main factors in determining the branch VA. The allocated ODL was enhanced by significant taxable income generated in the current year.

Citi's VA against FTC carry-forwards in its general basket was fully reversed in 2022 from $0.8 billion in 2021, primarily as a result of the effect of higher interest rates on the projections of future interest income. See Note 9.

Recognized FTCs comprised approximately $1.9 billion of Citi's DTAs as of December 31, 2022, compared to

approximately $2.8 billion as of December 31, 2021. The decrease in FTCs year-over-year was primarily due to current-year usage, net of the VA release. The FTC carry-forward period represents the most time-sensitive component of Citi's DTAs.

Citi had an ODL of approximately $8 billion at December 31, 2022, which allows it to elect a percentage between 50% and 100% of future years' domestic source income to be reclassified as foreign source income. (See Note 9 for a description of the ODL.)

The majority of Citi's U.S. federal net operating loss carry-forward and all of its New York State and New York City net operating loss carry-forwards are subject to a carry-forward period of 20 years. This provides enough time to fully utilize the net DTAs pertaining to these existing net operating loss carry-forwards. This is due to Citi's forecast of sufficient U.S. taxable income and the continued taxation of Citi's non-U.S. income by New York State and the City of New York.

Although realization is not assured, Citi believes that the realization of its recognized net DTAs of $27.7 billion at December 31, 2022 is more-likely-than-not, based upon management's expectations of future taxable income in the jurisdictions in which the DTAs arise, as well as available tax planning strategies (as defined in ASC Topic 740, *Income Taxes*). Citi has concluded that it has the necessary positive evidence to support the realization of its net DTAs after taking its VAs into consideration.

See Note 9 for additional information on Citi's income taxes, including its income tax provision, tax assets and liabilities and a tabular summary of Citi's net DTAs balance as of December 31, 2022 (including the FTCs and applicable expiration dates of the FTCs). For information on Citi's ability to use its DTAs, see "Risk Factors—Strategic Risks" above and Note 9.

Accounting Changes

See Note 1 for a discussion of changes in accounting standards.

DISCLOSURE CONTROLS AND PROCEDURES

Citi's disclosure controls and procedures are designed to ensure that information required to be disclosed under the Securities Exchange Act of 1934, as amended, is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, including without limitation that information required to be disclosed by Citi in its SEC filings is accumulated and communicated to management, including the Chief Executive Officer (CEO) and Chief Financial Officer (CFO), as appropriate, to allow for timely decisions regarding required disclosure.

Citi's Disclosure Committee assists the CEO and CFO in their responsibilities to design, establish, maintain and evaluate the effectiveness of Citi's disclosure controls and procedures. The Disclosure Committee is responsible for, among other things, the oversight, maintenance and implementation of the disclosure controls and procedures, subject to the supervision and oversight of the CEO and CFO.

Citi's management, with the participation of its CEO and CFO, has evaluated the effectiveness of Citigroup's disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934) as of December 31, 2022. Based on that evaluation, the CEO and CFO have concluded that at that date Citigroup's disclosure controls and procedures were effective.

MANAGEMENT'S ANNUAL REPORT ON INTERNAL CONTROL OVER FINANCIAL REPORTING

Citi's management is responsible for establishing and maintaining adequate internal control over financial reporting. Citi's internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of its financial reporting and the preparation of financial statements for external reporting purposes in accordance with U.S. generally accepted accounting principles. Citi's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of Citi's assets, (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles and that Citi's receipts and expenditures are made only in accordance with authorizations of Citi's management and directors and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of Citi's assets that could have a material effect on its financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect all misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions or that the degree of compliance with the policies or procedures may deteriorate.

Citi's management assessed the effectiveness of Citigroup's internal control over financial reporting as of December 31, 2022 based on the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in *Internal Control—Integrated Framework (2013)*. Based on this assessment, management believes that, as of December 31, 2022, Citi's internal control over financial reporting was effective. In addition, there were no changes in Citi's internal control over financial reporting during the fiscal quarter ended December 31, 2022 that materially affected, or are reasonably likely to materially affect, Citi's internal control over financial reporting.

The effectiveness of Citi's internal control over financial reporting as of December 31, 2022 has been audited by KPMG LLP, Citi's independent registered public accounting firm, as stated in their report below, which expressed an unqualified opinion on the effectiveness of Citi's internal control over financial reporting as of December 31, 2022.

FORWARD-LOOKING STATEMENTS

Certain statements in this report, including but not limited to statements included within the Management's Discussion and Analysis of Financial Condition and Results of Operations, are "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. In addition, Citigroup also may make forward-looking statements in its other documents filed with or furnished to the SEC, and its management may make forward-looking statements orally to analysts, investors, representatives of the media and others.

Generally, forward-looking statements are not based on historical facts but instead represent Citigroup's and its management's beliefs regarding future events. Such statements may be identified by words such as believe, expect, anticipate, intend, estimate, may increase, may fluctuate, target and illustrative, and similar expressions or future or conditional verbs such as will, should, may, would and could.

Such statements are based on management's current expectations and are subject to risks, uncertainties and changes in circumstances. Actual results of operations and financial conditions including capital and liquidity may differ materially from those included in these statements due to a variety of factors, including without limitation (i) the precautionary statements included within the "Executive Summary" and each individual business's discussion and analysis of its results of operations and (ii) the factors listed and described under "Risk Factors" above.

Any forward-looking statements made by or on behalf of Citigroup speak only as to the date they are made, and Citi does not undertake to update forward-looking statements to reflect the impact of circumstances or events that arise after the forward-looking statements were made.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Stockholders and Board of Directors
Citigroup Inc.:

Opinions on the Consolidated Financial Statements and Internal Control Over Financial Reporting
We have audited the accompanying consolidated balance sheets of Citigroup Inc. and subsidiaries (the Company) as of December 31, 2022 and 2021, the related consolidated statements of income, comprehensive income, changes in stockholders' equity, and cash flows for each of the years in the three-year period ended December 31, 2022, and the related notes (collectively, the consolidated financial statements). We also have audited the Company's internal control over financial reporting as of December 31, 2022, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the years in the three-year period ended December 31, 2022, in conformity with U.S. generally accepted accounting principles. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022 based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission.

Basis for Opinions
The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying management's annual report on internal controls over financial reporting. Our responsibility is to express an opinion on the Company's consolidated financial statements and an opinion on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control Over Financial Reporting
A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters
The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that: (1) relate to accounts or disclosures that are material to the consolidated financial statements and (2) involved our especially

challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to , which they relate.

Assessment of the fair value of certain Level 3 assets and liabilities measured on a recurring basis

As described in Notes 1, 6, 25 and 26 to the consolidated financial statements, the Company's net assets and liabilities recorded at fair value on a recurring basis were $840.9 billion and $360.1 billion, respectively at December 31, 2022. The Company estimated the fair value of Level 3 assets and liabilities measured on a recurring basis ($15.8 billion and $46.5 billion, respectively at December 31, 2022) utilizing various valuation techniques with one or more significant inputs or significant value drivers being unobservable including, but not limited to, complex internal valuation models, alternative pricing procedures or comparables analysis and discounted cash flows.

We identified the assessment of the measurement of fair value for certain Level 3 assets and liabilities recorded at fair value on a recurring basis as a critical audit matter. A high degree of effort, including specialized skills and knowledge, and subjective and complex auditor judgment was involved in the assessment of the Level 3 fair values due to measurement uncertainty. Specifically, the assessment encompassed the evaluation of the fair value methodology, including methods, models and significant assumptions and inputs used to estimate fair value. Significant assumptions include proxy data, forecast data, the extrapolation and interpolation of proxy data, forecast data, and historic data as well as certain model assumptions. The assessment also included an evaluation of the conceptual soundness and performance of the valuation models.

The following are the primary procedures we performed to address this critical audit matter. We involved valuation professionals with specialized skills and knowledge who assisted in evaluating the design and testing the operating effectiveness of certain internal controls related to the Company's Level 3 fair value measurements including controls over:

- valuation methodologies, including significant inputs and assumptions
- independent price verification
- evaluating that significant model assumptions and inputs reflected those which a market participant would use to determine an exit price in the current market environment
- the valuation models used were mathematically accurate and appropriate to value the financial instruments and
- relevant information used within the Company's models that was reasonably available was considered in the fair value determination.

Assessment of the allowance for credit losses collectively evaluated for impairment

As described in Notes 1 and 15 to the consolidated financial statements, the Company's allowance for credit losses was $19.1 billion as of December 31, 2022, which includes the allowance related to loans and unfunded lending commitments collectively evaluated for impairment (the collective ACLL). The expected credit losses for the quantitative component of the collective ACLL is the product of multiplying the probability of default (PD), loss given default (LGD), and exposure at default (EAD) for consumer and corporate loans. For consumer U.S. credit cards, the Company uses the payment rate approach over the life of the loan, which leverages payment rate curves, to determine the payments that should be applied to liquidate the end-of-period balance in the estimation of EAD. For unconditionally cancelable accounts, reserves are based on the expected life of the balance as of the evaluation date and do not include any undrawn commitments that are unconditionally cancelable. The credit loss factors applied are determined based on three macroeconomic scenarios (base, downside and upside) multiplied by their respective scenario probability weights, that take into consideration both internal and external forecasted macroeconomic variables, the most significant of which are U.S. unemployment and U.S. real gross domestic product (GDP). Additionally, for consumer U.S. credit card loans, these models consider leading credit indicators including loan delinquencies, as well as economic factors. For corporate loans, these models consider the credit quality as measured by risk ratings and economic factors. The qualitative component considers idiosyncratic events and the uncertainty of forward-looking economic scenarios.

We identified the assessment of the collective ACLL, specifically for consumer U.S. credit cards and corporate portfolios as a critical audit matter. Auditing the assessment involved significant measurement uncertainty requiring complex auditor judgment, and specialized skills and knowledge as well as experience in the industry. Our assessment encompassed the evaluation of the various components of the collective ACLL methodology, including the methods and models used to estimate the PD, LGD, and EAD and certain key assumptions and inputs for the Company's quantitative and qualitative components. Key assumptions and inputs for consumer loans included loan delinquencies, certain credit indicators, reasonable and supportable forecasts, expected life as well as economic factors, including unemployment rates, GDP, and housing prices which are considered in the model. For corporate loans, key assumptions and inputs included risk ratings, reasonable and supportable forecast, credit conversion factor for unfunded lending commitments, and economic factors, including GDP and unemployment rate considered in the model. Key assumptions and inputs for the qualitative component for consumer U.S. credit card loans include the expected normalization in portfolio performance and consumer behavior, after lower losses observed as a result of government stimulus and market liquidity. Key

assumptions and inputs for the qualitative component for corporate loan portfolios include uncertainty around the war in Ukraine and global recession, considering macroeconomic and market factors, including inflation, interest rates and commodity prices and their impacts on industries and sectors that are considered more vulnerable. The assessment also included an evaluation of the conceptual soundness and performance of the PD, LGD, and EAD models. In addition, auditor judgment was required to evaluate the sufficiency of audit evidence obtained.

The following are the primary procedures we performed to address this critical audit matter. We evaluated the design and tested the operating effectiveness of certain internal controls related to the Company's measurement of the collective ACLL estimate, including controls over the:

- approval of the collective ACLL methodologies
- determination of the key assumptions and inputs used to estimate the quantitative and qualitative components of the collective ACLL
- performance monitoring of the PD, LGD, and EAD models.

We evaluated the Company's process to develop the collective ACLL estimate by testing certain sources of data and assumptions that the Company used and considered the relevance and reliability of such data and assumptions. In addition, we involved credit risk professionals with specialized skills and knowledge, who assisted in:

- reviewing the Company's collective ACLL methodologies and key assumptions for compliance with U.S. generally accepted accounting principles
- assessing the conceptual soundness and performance testing of the PD, LGD, and EAD models by inspecting the model documentation to determine whether the models are suitable for their intended use
- evaluating judgments made by the Company relative to the development and performance monitoring testing of the PD, LGD, and EAD models by comparing them to relevant Company-specific metrics
- assessing the conceptual soundness and performance testing of the macroeconomic scenario weights model by inspecting the model documentation to determine whether the model is suitable for its intended use
- assessing the economic forecast scenarios through comparison to publicly available forecasts
- evaluating the methodologies used to develop certain economic forecast scenarios by comparing it to relevant industry practices
- testing corporate loan risk ratings for a selection of borrowers by evaluating the financial performance of the borrower, sources of repayment, and any relevant guarantees or underlying collateral
- evaluating the methodologies used in determining the qualitative components and the effect of that component on the collective ACLL compared with relevant credit risk factors and consistency with credit trends.

We also assessed the sufficiency of the audit evidence obtained related to the collective ACLL by evaluating the:

- cumulative results of the audit procedures
- qualitative aspects of the Company's accounting practices
- potential bias in the accounting estimates.

Evaluation of goodwill in the ICG Banking and PBWM US PB reporting units

As discussed in Notes 1 and 16 to the consolidated financial statements, the goodwill balance as of December 31, 2022 was $19.7 billion, of which $9.7 billion related to reporting units within the Personal Banking and Wealth Management (PBWM) segment, $9.0 billion related to reporting units within the Institutional Clients Group (ICG) segment, and $1.0 billion related to reporting units within the Legacy Franchises segment. The Company performs goodwill impairment testing on an annual basis and whenever events or changes in circumstances indicate that the carrying value of a reporting unit likely exceeds its fair value. This involves estimating the fair value of the reporting units using both discounted cash flow analyses and a market multiples approach.

We identified the evaluation of the goodwill impairment analysis for the ICG Banking and PBWM United States Personal Banking reporting units, one of the three reporting units within the ICG segment and one of the two reporting units in the PBWM segment, as a critical audit matter. The estimated fair value of the ICG Banking and PBWM United States Personal Banking reporting units marginally exceeded their carrying values, indicating a higher risk due to measurement uncertainty that the goodwill may be impaired and, therefore, involved a high degree of subjective auditor judgment. Specifically, the assessment encompassed the evaluation of the key assumptions used in estimating the fair value of the ICG Banking and PBWM United States Personal Banking reporting units, which include the long-term growth rate, discount rate, exit multiple assumptions, certain forecasted macroeconomic assumptions used to inform the forecasted income by reporting unit, and forecasted revenues and operating expenses by reporting unit used in the discounted cash flow analyses.

The following are the primary procedures we performed to address this critical audit matter. We evaluated the design and tested the operating effectiveness of certain internal controls related to the Company's determination of the estimated fair value of the ICG Banking and PBWM United States Personal Banking reporting units, including controls related to management's process for assessing the appropriateness of:

- certain assumptions including the long-term growth rate, discount rate and exit multiple assumptions used in the discounted cash flow analyses

- certain forecasted macroeconomic assumptions used to inform the forecasted income by reporting unit
- forecasted revenues and operating expenses by reporting unit.

We compared the Company's historical forecasts to actual results at a consolidated level to assess the Company's ability to accurately forecast key metrics such as revenues and operating expenses. We also compared prior year actuals to the expected trends for revenues and operating expenses at the reporting unit level to assess the Company's ability to achieve their forecasts. We compared the Company's fourth quarter 2022 forecasts to actual fourth quarter 2022 results at the reporting unit level to assess the Company's ability to accurately forecast. We evaluated the reasonableness of the Company's forecasts by comparing to analyst reports.

In addition, we involved a valuation professional with specialized skills and knowledge, who assisted in:

- developing an independent range of long-term growth rate assumptions by reviewing publicly available data and comparable industries and comparing it to the Company's assumption
- evaluating the discount rate by assessing the methodology used by management and developing an independent assumption for the discount rate
- developing an independent range of the exit multiple assumptions using publicly available data for comparable entities and comparing it to the Company's assumption utilized in the discounted cash flow analysis
- developing an independent estimate of the fair value of ICG Banking and PBWM United States Personal Banking reporting units using the income and market multiple approaches and comparing the results to the Company's fair value estimate
- assessing the reasonableness of the market capitalization reconciliation.

/s/ KPMG LLP

We have served as the Company's auditor since 1969.

New York, New York
February 24, 2023

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CONSOLIDATED FINANCIAL STATEMENTS
CONSOLIDATED STATEMENT OF INCOME

Citigroup Inc. and Subsidiaries

In millions of dollars, except per share amounts	Years ended December 31, 2022	2021	2020
Revenues			
Interest revenue	$ 74,408	$ 50,475	$ 58,089
Interest expense	25,740	7,981	13,338
Net interest income	$ 48,668	$ 42,494	$ 44,751
Commissions and fees	$ 9,175	$ 13,672	$ 11,385
Principal transactions	14,159	10,154	13,885
Administration and other fiduciary fees	3,784	3,943	3,472
Realized gains on sales of investments, net	67	665	1,756
Impairment losses on investments:			
Impairment losses on investments and other assets	(499)	(206)	(165)
Provision for credit losses on AFS debt securities[1]	5	(3)	(3)
Net impairment losses recognized in earnings	$ (494)	$ (209)	$ (168)
Other revenue	$ (21)	$ 1,165	$ 420
Total non-interest revenues	$ 26,670	$ 29,390	$ 30,750
Total revenues, net of interest expense	$ 75,338	$ 71,884	$ 75,501
Provisions for credit losses and for benefits and claims			
Provision for credit losses on loans	$ 4,745	$ (3,103)	$ 15,922
Provision for credit losses on held-to-maturity (HTM) debt securities	33	(3)	7
Provision for credit losses on other assets	76	—	7
Policyholder benefits and claims	94	116	113
Provision for credit losses on unfunded lending commitments	291	(788)	1,446
Total provisions for credit losses and for benefits and claims[2]	$ 5,239	$ (3,778)	$ 17,495
Operating expenses			
Compensation and benefits	$ 26,655	$ 25,134	$ 22,214
Premises and equipment	2,320	2,314	2,333
Technology/communication	8,587	7,828	7,383
Advertising and marketing	1,556	1,490	1,217
Other operating	12,174	11,427	11,227
Total operating expenses	$ 51,292	$ 48,193	$ 44,374
Income from continuing operations before income taxes	$ 18,807	$ 27,469	$ 13,632
Provision for income taxes	3,642	5,451	2,525
Income from continuing operations	$ 15,165	$ 22,018	$ 11,107
Discontinued operations			
Income (loss) from discontinued operations	$ (272)	$ 7	$ (20)
Benefit for income taxes	(41)	—	—
Income (loss) from discontinued operations, net of taxes	$ (231)	$ 7	$ (20)
Net income before attribution of noncontrolling interests	$ 14,934	$ 22,025	$ 11,087
Noncontrolling interests	89	73	40
Citigroup's net income	$ 14,845	$ 21,952	$ 11,047
Basic earnings per share[3]			
Income from continuing operations	$ 7.16	$ 10.21	$ 4.75
Loss from discontinued operations, net of taxes	(0.12)	—	(0.01)
Net income	$ 7.04	$ 10.21	$ 4.74
Weighted average common shares outstanding *(in millions)*	1,946.7	2,033.0	2,085.8
Diluted earnings per share[3]			
Income from continuing operations	$ 7.11	$ 10.14	$ 4.73
Loss from discontinued operations, net of taxes	(0.12)	—	(0.01)
Net income	$ 7.00	$ 10.14	$ 4.72
Adjusted weighted average diluted common shares outstanding *(in millions)*	1,964.3	2,049.4	2,099.0

(1) In accordance with ASC 326, which requires the provision for credit losses on AFS securities to be included in revenue.
(2) This total excludes the provision for credit losses on AFS securities, which is disclosed separately above.
(3) Due to rounding, earnings per share on continuing operations and discontinued operations may not sum to earnings per share on net income.

The Notes to the Consolidated Financial Statements are an integral part of these Consolidated Financial Statements.

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

Citigroup Inc. and Subsidiaries

	Years ended December 31,		
In millions of dollars	**2022**	2021	2020
Citigroup's net income	**$ 14,845**	$ 21,952	$ 11,047
Add: Citigroup's other comprehensive income (loss)[1]			
Net change in unrealized gains and losses on debt securities, net of taxes[2]	**$ (5,384)**	$ (3,934)	$ 3,585
Net change in debt valuation adjustment (DVA), net of taxes[3]	**2,029**	232	(475)
Net change in cash flow hedges, net of taxes	**(2,623)**	(1,492)	1,470
Benefit plans liability adjustment, net of taxes[4]	**97**	1,012	(55)
Net change in CTA, net of taxes and hedges	**(2,471)**	(2,525)	(250)
Net change in excluded component of fair value hedges, net of taxes	**55**	—	(15)
Citigroup's total other comprehensive income (loss)	**$ (8,297)**	$ (6,707)	$ 4,260
Citigroup's total comprehensive income	**$ 6,548**	$ 15,245	$ 15,307
Add: Other comprehensive income (loss) attributable to noncontrolling interests	**$ (58)**	$ (99)	$ 26
Add: Net income attributable to noncontrolling interests	**89**	73	40
Total comprehensive income	**$ 6,579**	$ 15,219	$ 15,373

(1) See Note 20.
(2) See Note 1.
(3) See Note 25.
(4) See Note 8.

The Notes to the Consolidated Financial Statements are an integral part of these Consolidated Financial Statements.

CONSOLIDATED BALANCE SHEET

Citigroup Inc. and Subsidiaries

In millions of dollars	December 31, 2022	2021
Assets		
Cash and due from banks (including segregated cash and other deposits)	$ **30,577**	$ 27,515
Deposits with banks, net of allowance	**311,448**	234,518
Securities borrowed and purchased under agreements to resell (including $239,527 and $216,466 as of December 31, 2022 and 2021, respectively, at fair value), net of allowance	**365,401**	327,288
Brokerage receivables, net of allowance	**54,192**	54,340
Trading account assets (including $133,535 and $133,828 pledged to creditors at December 31, 2022 and 2021, respectively)	**334,114**	331,945
Investments:		
Available-for-sale debt securities (including $10,933 and $9,226 pledged to creditors as of December 31, 2022 and 2021, respectively), net of allowance	**249,679**	288,522
Held-to-maturity debt securities (fair value of which is $243,648 and $216,038 as of December 31, 2022 and 2021, respectively) (includes $— and $1,460 pledged to creditors as of December 31, 2022 and 2021, respectively), net of allowance	**268,863**	216,963
Equity securities (including $895 and $1,032 as of December 31, 2022 and 2021, respectively, at fair value)	**8,040**	7,337
Total investments	$ **526,582**	$ 512,822
Loans:		
Consumer (including $237 and $12 as of December 31, 2022 and 2021, respectively, at fair value)	**368,067**	376,534
Corporate (including $5,123 and $6,070 as of December 31, 2022 and 2021, respectively, at fair value)	**289,154**	291,233
Loans, net of unearned income	$ **657,221**	$ 667,767
Allowance for credit losses on loans (ACLL)	**(16,974)**	(16,455)
Total loans, net	$ **640,247**	$ 651,312
Goodwill	**19,691**	21,299
Intangible assets (including MSRs of $665 and $404 as of December 31, 2022 and 2021, respectively, at fair value)	**4,428**	4,495
Premises and equipment, net of depreciation and amortization	**26,253**	24,328
Other assets (including $10,658 and $12,342 as of December 31, 2022 and 2021, respectively, at fair value), net of allowance	**103,743**	101,551
Total assets	$ **2,416,676**	$ 2,291,413

Statement continues on the next page.

CONSOLIDATED BALANCE SHEET
(Continued)

Citigroup Inc. and Subsidiaries

In millions of dollars, except shares and per share amounts	December 31, 2022	2021
Liabilities		
Deposits (including $1,875 and $1,666 as of December 31, 2022 and 2021, respectively, at fair value)	$ **1,365,954**	$ 1,317,230
Securities loaned and sold under agreements to repurchase (including $70,886 and $56,694 as of December 31, 2022 and 2021, respectively, at fair value)	**202,444**	191,285
Brokerage payables (including $4,439 and $3,575 as of December 31, 2022 and 2021, respectively, at fair value)	**69,218**	61,430
Trading account liabilities	**170,647**	161,529
Short-term borrowings (including $6,222 and $7,358 as of December 31, 2022 and 2021, respectively, at fair value)	**47,096**	27,973
Long-term debt (including $105,995 and $82,609 as of December 31, 2022 and 2021, respectively, at fair value)	**271,606**	254,374
Other liabilities	**87,873**	74,920
Total liabilities	$ **2,214,838**	$ 2,088,741
Stockholders' equity		
Preferred stock ($1.00 par value; authorized shares: 30 million), issued shares: **759,800 as of December 31, 2022** and 759,800 as of December 31, 2021, at aggregate liquidation value	$ **18,995**	$ 18,995
Common stock ($0.01 par value; authorized shares: 6 billion), issued shares: **3,099,669,424 as of December 31, 2022** and 3,099,651,835 as of December 31, 2021	**31**	31
Additional paid-in capital	**108,458**	108,003
Retained earnings	**194,734**	184,948
Treasury stock, at cost: **1,162,682,999 shares as of December 31, 2022** and 1,115,296,641 shares as of December 31, 2021	**(73,967)**	(71,240)
Accumulated other comprehensive income (loss) (*AOCI*)	**(47,062)**	(38,765)
Total Citigroup stockholders' equity	$ **201,189**	$ 201,972
Noncontrolling interests	**649**	700
Total equity	$ **201,838**	$ 202,672
Total liabilities and equity	$ **2,416,676**	$ 2,291,413

The Notes to the Consolidated Financial Statements are an integral part of these Consolidated Financial Statements.

CONSOLIDATED STATEMENT OF CHANGES IN STOCKHOLDERS' EQUITY

Citigroup Inc. and Subsidiaries

	Years ended December 31,					
	Amounts			Shares		
In millions of dollars, except shares in thousands	2022	2021	2020	2022	2021	2020
Preferred stock at aggregate liquidation value						
Balance, beginning of year	$ 18,995	$ 19,480	$ 17,980	760	779	719
Issuance of new preferred stock	—	3,300	3,000	—	132	120
Redemption of preferred stock	—	(3,785)	(1,500)	—	(151)	(60)
Balance, end of year	$ 18,995	$ 18,995	$ 19,480	760	760	779
Common stock and additional paid-in capital (APIC)						
Balance, beginning of year	$ 108,034	$ 107,877	$ 107,871	3,099,652	3,099,633	3,099,603
Employee benefit plans	455	85	5	17	19	30
Preferred stock issuance costs (new issuances, net of reclassifications to retained earnings for redemptions)	—	25	(4)	—	—	—
Other	—	47	5	—	—	—
Balance, end of year	$ 108,489	$ 108,034	$ 107,877	3,099,669	3,099,652	3,099,633
Retained earnings						
Balance, beginning of year	$ 184,948	$ 168,272	$ 165,369			
Adjustments to opening balance, net of taxes[1]						
Financial instruments—credit losses (CECL adoption)	—	—	(3,076)			
Variable post-charge-off third-party collection costs	—	—	330			
Adjusted balance, beginning of year	$ 184,948	$ 168,272	$ 162,623			
Citigroup's net income	14,845	21,952	11,047			
Common dividends[2]	(4,028)	(4,196)	(4,299)			
Preferred dividends	(1,032)	(1,040)	(1,095)			
Other (primarily reclassifications from APIC for preferred issuance costs on redemptions)	1	(40)	(4)			
Balance, end of year	$ 194,734	$ 184,948	$ 168,272			
Treasury stock, at cost						
Balance, beginning of year	$ (71,240)	$ (64,129)	$ (61,660)	(1,115,297)	(1,017,544)	(985,480)
Employee benefit plans[3]	523	489	456	8,190	7,745	8,676
Treasury stock acquired[4]	(3,250)	(7,600)	(2,925)	(55,576)	(105,498)	(40,740)
Balance, end of year	$ (73,967)	$ (71,240)	$ (64,129)	(1,162,683)	(1,115,297)	(1,017,544)
Citigroup's accumulated other comprehensive income (loss)						
Balance, beginning of year	$ (38,765)	$ (32,058)	$ (36,318)			
Citigroup's total other comprehensive income (loss)	(8,297)	(6,707)	4,260			
Balance, end of year	$ (47,062)	$ (38,765)	$ (32,058)			
Total Citigroup common stockholders' equity	$ 182,194	$ 182,977	$ 179,962	1,936,986	1,984,355	2,082,089
Total Citigroup stockholders' equity	$ 201,189	$ 201,972	$ 199,442			
Noncontrolling interests						
Balance, beginning of year	$ 700	$ 758	$ 704			
Transactions between Citigroup and the noncontrolling-interest shareholders	(34)	(10)	(4)			
Net income attributable to noncontrolling-interest shareholders	89	73	40			
Distributions paid to noncontrolling-interest shareholders	(51)	(10)	(2)			
Other comprehensive income (loss) attributable to noncontrolling-interest shareholders	(58)	(99)	26			
Other	3	(12)	(6)			
Net change in noncontrolling interests	$ (51)	$ (58)	$ 54			
Balance, end of year	$ 649	$ 700	$ 758			
Total equity	$ 201,838	$ 202,672	$ 200,200			

(1) See Note 1 for additional details.

(2) Common dividends declared were $0.51 per share in the first, second, third and fourth quarters of 2022, 2021 and 2020.

(3) Includes treasury stock related to (i) certain activity on employee stock option program exercises where the employee delivers existing shares to cover the option exercise, or (ii) under Citi's employee restricted or deferred stock programs where shares are withheld to satisfy tax requirements.
(4) Primarily consists of open market purchases under Citi's Board of Directors-approved common stock repurchase program.

The Notes to the Consolidated Financial Statements are an integral part of these Consolidated Financial Statements.

CONSOLIDATED STATEMENT OF CASH FLOWS

Citigroup Inc. and Subsidiaries

In millions of dollars	Years ended December 31, 2022	2021	2020
Cash flows from operating activities of continuing operations			
Net income before attribution of noncontrolling interests	$ 14,934	$ 22,025	$ 11,087
Net income attributable to noncontrolling interests	89	73	40
Citigroup's net income	$ 14,845	$ 21,952	$ 11,047
Income (loss) from discontinued operations, net of taxes	(231)	7	(20)
Income from continuing operations—excluding noncontrolling interests	$ 15,076	$ 21,945	$ 11,067
Adjustments to reconcile net income to net cash provided by (used in) operating activities of continuing operations			
Net loss (gain) on sale of significant disposals[1]	(762)	700	—
Depreciation and amortization	4,262	3,964	3,937
Deferred income taxes	(1,141)	1,413	(2,333)
Provisions for credit losses on loans and unfunded lending commitments	5,036	(3,891)	17,368
Realized gains from sales of investments	(67)	(665)	(1,756)
Impairment losses on investments and other assets	499	206	165
Goodwill impairment	535	—	—
Change in trading account assets	(2,273)	43,059	(98,997)
Change in trading account liabilities	9,118	(6,498)	48,133
Change in brokerage receivables net of brokerage payables	7,936	1,412	(3,066)
Change in loans held-for-sale (HFS)	4,421	(3,809)	1,202
Change in other assets	(4,992)	(2,139)	(1,012)
Change in other liabilities	5,343	6,839	558
Other, net[2]	(17,922)	(15,446)	1,246
Total adjustments	$ 9,993	$ 25,145	$ (34,555)
Net cash provided by (used in) operating activities of continuing operations[2]	$ 25,069	$ 47,090	$ (23,488)
Cash flows from investing activities of continuing operations			
Change in securities borrowed and purchased under agreements to resell	$ (38,113)	$ (32,576)	$ (43,390)
Change in loans	(16,591)	(1,173)	14,249
Proceeds from sales and securitizations of loans	4,709	2,918	1,495
Proceeds from divestitures[1]	5,741	—	—
Available-for-sale (AFS) debt securities[3]			
Purchases of investments[2]	(218,747)	(205,980)	(306,801)
Proceeds from sales of investments	79,687	125,895	144,035
Proceeds from maturities of investments	140,934	120,936	110,941
Held-to-maturity (HTM) debt securities[3]			
Purchases of investments	(42,903)	(136,450)	(25,586)
Proceeds from maturities of investments	12,188	21,164	15,215
Capital expenditures on premises and equipment and capitalized software	(5,632)	(4,119)	(3,446)
Proceeds from sales of premises and equipment, subsidiaries and affiliates and repossessed assets	63	190	50
Other, net[2]	(791)	(1,551)	793
Net cash used in investing activities of continuing operations[2]	$ (79,455)	$ (110,746)	$ (92,445)
Cash flows from financing activities of continuing operations			
Dividends paid	$ (5,003)	$ (5,198)	$ (5,352)
Issuance of preferred stock	—	3,300	2,995
Redemption of preferred stock	—	(3,785)	(1,500)
Treasury stock acquired	(3,250)	(7,601)	(2,925)
Stock tendered for payment of withholding taxes	(344)	(337)	(411)

CONSOLIDATED STATEMENT OF CASH FLOWS (Continued)

Citigroup Inc. and Subsidiaries

In millions of dollars	Years ended December 31, 2022	2021	2020
Change in securities loaned and sold under agreements to repurchase	$ 11,159	$ (8,240)	$ 33,186
Issuance of long-term debt	104,748	70,658	76,458
Payments and redemptions of long-term debt	(57,085)	(74,950)	(63,402)
Change in deposits	68,415	44,966	210,081
Change in short-term borrowings	19,123	(1,541)	(15,535)
Net cash provided by financing activities of continuing operations	$ 137,763	$ 17,272	$ 233,595
Effect of exchange rate changes on cash and due from banks	$ (3,385)	$ (1,198)	$ (1,966)
Change in cash, due from banks and deposits with banks	79,992	(47,582)	115,696
Cash, due from banks and deposits with banks at beginning of year	262,033	309,615	193,919
Cash, due from banks and deposits with banks at end of year	$ 342,025	$ 262,033	$ 309,615
Cash and due from banks (including segregated cash and other deposits)	$ 30,577	$ 27,515	$ 26,349
Deposits with banks, net of allowance	311,448	234,518	283,266
Cash, due from banks and deposits with banks at end of year	$ 342,025	$ 262,033	$ 309,615
Supplemental disclosure of cash flow information for continuing operations			
Cash paid during the year for income taxes	$ 3,733	$ 4,028	$ 4,797
Cash paid during the year for interest	22,615	7,143	12,094
Non-cash investing activities[1][4]			
Transfer of investment securities from AFS to HTM	$ 21,688	$ —	$ —
Decrease in net loans associated with divestitures reclassified to HFS	16,956	9,945	—
Decrease in goodwill associated with divestitures reclassified to HFS	876	—	—
Transfers to loans HFS (*Other assets*) from loans	5,582	7,414	2,614
Non-cash financing activities[1]			
Decrease in long-term debt associated with divestitures reclassified to HFS	$ —	$ 479	$ —
Decrease in deposits associated with divestitures reclassified to HFS	19,691	8,407	—

(1) See Note 2 for further information on significant disposals.
(2) See "Statement of Cash Flows" in Note 1.
(3) Citi has revised the Consolidated Statement of Cash Flows to present purchases of investments, sales of investments and proceeds from maturities of investments separately between AFS debt securities and HTM debt securities. Citi had no sales of HTM debt securities during the periods presented.
(4) Operating and finance lease right-of-use assets and lease liabilities represent non-cash investing and financing activities, respectively, and are not included in the non-cash investing activities presented here. See Note 28 for more information and balances as of December 31, 2022 and 2021, respectively.

The Notes to the Consolidated Financial Statements are an integral part of these Consolidated Financial Statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Throughout these Notes, "Citigroup," "Citi" and the "Company" refer to Citigroup Inc. and its consolidated subsidiaries.

Certain reclassifications and updates have been made to the prior periods' financial statements and notes to conform to the current period's presentation.

Principles of Consolidation

The Consolidated Financial Statements include the accounts of Citigroup and its subsidiaries prepared in accordance with U.S. generally accepted accounting principles (GAAP). The Company consolidates subsidiaries in which it holds, directly or indirectly, more than 50% of the voting rights or where it exercises control. Entities in which the Company holds 20% to 50% of the voting rights and/or has the ability to exercise significant influence, other than investments of designated venture capital subsidiaries or investments accounted for at fair value under the fair value option, are accounted for under the equity method, and the pro rata share of their income (loss) is included in *Other revenue*. Income from investments in less-than-20%-owned companies is recognized when dividends are received. As discussed in more detail in Note 22, Citigroup also consolidates entities deemed to be variable interest entities when Citigroup is determined to be the primary beneficiary. Gains and losses on the disposition of branches, subsidiaries, affiliates, buildings and other investments are included in *Other revenue*.

Citibank

Citibank, N.A. (Citibank) is a commercial bank and indirect wholly owned subsidiary of Citigroup. Citibank's principal offerings include investment banking, commercial banking, cash management, trade finance and e-commerce; private banking products and services; consumer finance, credit cards, and mortgage lending; and retail banking products and services.

Variable Interest Entities (VIEs)

An entity is a variable interest entity (VIE) if it meets either of the criteria outlined in Accounting Standards Codification (ASC) Topic 810, *Consolidation*, which are (i) the entity has equity that is insufficient to permit the entity to finance its activities without additional subordinated financial support from other parties, or (ii) the entity has equity investors that cannot make significant decisions about the entity's operations or that do not absorb their proportionate share of the entity's expected losses or expected returns.

The Company consolidates a VIE when it has both the power to direct the activities that most significantly impact the VIE's economic performance and a right to receive benefits or the obligation to absorb losses of the entity that could be potentially significant to the VIE (that is, Citi is the primary beneficiary). In addition to variable interests held in consolidated VIEs, the Company has variable interests in other VIEs that are not consolidated because the Company is not the primary beneficiary.

All unconsolidated VIEs are monitored by the Company to assess whether any events have occurred to cause its primary beneficiary status to change.

All entities not deemed to be VIEs with which the Company has involvement are evaluated for consolidation under other subtopics of ASC 810. See Note 22 for more detailed information.

Foreign Currency Translation

Assets and liabilities of Citi's foreign operations are translated from their respective functional currencies into U.S. dollars using period-end spot foreign exchange rates. The effects of those translation adjustments are reported in *Accumulated other comprehensive income (loss) (AOCI)*, a component of stockholders' equity, net of any related hedge and tax effects, until realized upon sale or substantial liquidation of the foreign entity, at which point such amounts are reclassified into earnings. Revenues and expenses of Citi's foreign operations are translated monthly from their respective functional currencies into U.S. dollars at amounts that approximate weighted average exchange rates.

For transactions that are denominated in a currency other than the functional currency, including transactions denominated in the local currencies of foreign operations that use the U.S. dollar as their functional currency, the effects of changes in exchange rates are primarily included in *Principal transactions*, along with the related effects of any economic hedges. Instruments used to hedge foreign currency exposures include foreign currency forward, option and swap contracts and, in certain instances, designated issues of non-U.S.-dollar debt. Foreign operations in countries with highly inflationary economies designate the U.S. dollar as their functional currency, with the effects of changes in exchange rates primarily included in *Other revenue*.

Investment Securities

Investments include debt and equity securities. Debt securities include bonds, notes and redeemable preferred stocks, as well as certain loan-backed and structured securities that are subject to prepayment risk. Equity securities include common and nonredeemable preferred stock.

Debt Securities

- Debt securities classified as "held-to-maturity" (HTM) are securities that the Company has both the ability and the intent to hold until maturity and are carried at amortized cost. Interest income on such securities is included in *Interest revenue*.
- Debt securities classified as "available-for-sale" (AFS) are carried at fair value with changes in fair value reported in *Accumulated other comprehensive income (loss)*, a component of stockholders' equity, net of applicable income taxes and hedges. Interest income on such securities is included in *Interest revenue*.

For investments in debt securities classified as HTM or AFS, the accrual of interest income is suspended for investments that are in default or for which it is likely that future interest payments will not be made as scheduled.

Investment securities not measured at fair value through earnings include (i) debt securities held in HTM or AFS, (ii) equity securities accounted for under the Measurement Alternative or equity method, (iii) Federal Reserve Bank and Federal Home Loan Bank stock and (iv) certain exchange memberships. These securities are subject to evaluation for impairment as described in Note 15 for HTM securities and in Note 13 for AFS, Measurement Alternative and equity method investments. Realized gains and losses on sales of investments are included in earnings, primarily on a specific identification basis.

The Company uses a number of valuation techniques for investments carried at fair value, which are described in Note 25.

Equity Securities

- Marketable equity securities are measured at fair value with changes in fair value recognized in earnings.
- Non-marketable equity securities are measured at fair value with changes in fair value recognized in earnings unless (i) the measurement alternative is elected or (ii) the investment represents Federal Reserve Bank and Federal Home Loan Bank stock or certain exchange seats that continue to be carried at cost. Non-marketable equity securities under the measurement alternative are carried at cost less impairment (if any), plus or minus changes resulting from observed prices for orderly transactions for the identical or a similar investment of the same issuer.
- Certain investments that would otherwise have been accounted for using the equity method are carried at fair value with changes in fair value recognized in earnings, since the Company elected to apply fair value accounting.

Trading Account Assets and Liabilities

Trading account assets include debt and marketable equity securities, derivatives in a receivable position, residual interests in securitizations and physical commodities inventory. In addition, as described in Note 26, certain assets that Citigroup has elected to carry at fair value under the fair value option, such as loans and purchased guarantees, are also included in *Trading account assets*.

Trading account liabilities include securities sold, not yet purchased (short positions) and derivatives in a net payable position, as well as certain liabilities that Citigroup has elected to carry at fair value (as described in Note 26).

Other than physical commodities inventory, all trading account assets and liabilities are carried at fair value. Revenues generated from trading assets and trading liabilities are generally reported in *Principal transactions* and include realized gains and losses as well as unrealized gains and losses resulting from changes in the fair value of such instruments. Interest income on trading assets is recorded in *Interest revenue* reduced by interest expense on trading liabilities.

Physical commodities inventory is carried at the lower of cost or market with related losses reported in *Principal transactions*, except when included in a hedging relationship. Realized gains and losses on sales of commodities inventory are included in *Principal transactions*. Investments in unallocated precious metals accounts (gold, silver, platinum and palladium) are accounted for as hybrid instruments containing a debt host contract and an embedded non-financial derivative instrument indexed to the price of the relevant precious metal. The embedded derivative instrument and debt host contract are carried at fair value under the fair value option, as described in Note 26.

Derivatives used for trading purposes include interest rate, currency, equity, credit and commodity swap agreements, options, caps and floors, warrants, and financial and commodity futures and forward contracts. Derivative asset and liability positions are presented net by counterparty on the Consolidated Balance Sheet when a valid master netting agreement exists and the other conditions set out in ASC Topic 210-20, *Balance Sheet—Offsetting*, are met. See Note 23.

The Company uses a number of techniques to determine the fair value of trading assets and liabilities, which are described in Note 25.

Securities Borrowed and Securities Loaned

Securities borrowing and lending transactions do not constitute a sale of the underlying securities for accounting purposes and are treated as collateralized financing transactions. Such transactions are recorded at the amount of proceeds advanced or received plus accrued interest. As described in Note 26, the Company has elected to apply fair value accounting to a number of securities borrowing and lending transactions. Fees received or paid for all securities borrowing and lending transactions are recorded in *Interest revenue* or *Interest expense* at the contractually specified rate.

Where the conditions of ASC 210-20-45-1, *Balance Sheet—Offsetting: Right of Setoff Conditions*, are met, securities borrowing and lending transactions are presented net on the Consolidated Balance Sheet.

The Company monitors the fair value of securities borrowed or loaned on a daily basis and obtains or posts additional collateral in order to maintain contractual margin protection.

As described in Note 25, the Company uses a discounted cash flow technique to determine the fair value of securities lending and borrowing transactions.

Repurchase and Resale Agreements

Securities sold under agreements to repurchase (repos) and securities purchased under agreements to resell (reverse repos) do not constitute a sale (or purchase) of the underlying securities for accounting purposes and are treated as collateralized financing transactions. As described in Note 26, the Company has elected to apply fair value accounting to certain portions of such transactions, with changes in fair value reported in earnings. Any transactions for which fair value accounting has not been elected are recorded at the amount of cash advanced or received plus accrued interest. Irrespective of whether the Company has elected fair value accounting, interest paid or received on all repo and reverse

repo transactions is recorded in *Interest expense* or *Interest revenue* at the contractually specified rate.

Where the conditions of ASC 210-20-45-11, *Balance Sheet—Offsetting: Repurchase and Reverse Repurchase Agreements*, are met, repos and reverse repos are presented net on the Consolidated Balance Sheet.

The Company's policy is to take possession of securities purchased under reverse repurchase agreements. The Company monitors the fair value of securities subject to repurchase or resale on a daily basis and obtains or posts additional collateral in order to maintain contractual margin protection.

As described in Note 25, the Company uses a discounted cash flow technique to determine the fair value of repo and reverse repo transactions.

Loans

Loans are reported at their outstanding principal balances net of any unearned income and unamortized deferred fees and costs, except for credit card receivable balances, which include accrued interest and fees. Loan origination fees and certain direct origination costs are generally deferred and recognized as adjustments to income over the lives of the related loans.

As described in Note 26, Citi has elected fair value accounting for certain loans. Such loans are carried at fair value with changes in fair value reported in earnings. Interest income on such loans is recorded in *Interest revenue* at the contractually specified rate.

Loans that are held-for-investment are classified as *Loans, net of unearned income* on the Consolidated Balance Sheet, and the related cash flows are included within the cash flows from the investing activities category in the Consolidated Statement of Cash Flows on the line *Change in loans*. However, when the initial intent for holding a loan has changed from held-for-investment to held-for-sale (HFS), the loan is reclassified to HFS, but the related cash flows continue to be reported in cash flows from investing activities in the Consolidated Statement of Cash Flows on the line *Proceeds from sales and securitizations of loans*.

Consumer Loans

Consumer loans represent loans and leases managed primarily by the *Personal Banking and Wealth Management* and *Legacy Franchises* businesses (except Mexico SBMM loans).

Consumer Non-accrual and Re-aging Policies

As a general rule, interest accrual ceases for installment and real estate (both open- and closed-end) loans when payments are 90 days contractually past due. For credit cards and other unsecured revolving loans, however, Citi generally accrues interest until payments are 180 days past due. As a result of OCC guidance, home equity loans in regulated bank entities are classified as non-accrual if the related residential first mortgage is 90 days or more past due. Also as a result of OCC guidance, mortgage loans in regulated bank entities are classified as non-accrual within 60 days of notification that the borrower has filed for bankruptcy, with the exception of Federal Housing Administration (FHA)-insured loans.

Loans that have been modified to grant a concession to a borrower in financial difficulty may not be accruing interest at the time of the modification. The policy for returning such modified loans to accrual status varies by product and/or region. In most cases, a minimum number of payments (ranging from one to six) is required, while in other cases the loan is never returned to accrual status. For regulated bank entities, such modified loans are returned to accrual status if a credit evaluation at the time of, or subsequent to, the modification indicates the borrower is able to meet the restructured terms, and the borrower is current and has demonstrated a reasonable period of sustained payment performance (minimum six months of consecutive payments).

For U.S. consumer loans, generally one of the conditions to qualify for modification (other than for loan modifications made through the CARES Act relief provisions or banking agency guidance for pandemic-related issues) is that a minimum number of payments (typically ranging from one to three) must be made. Upon modification, the loan is re-aged to current status. However, re-aging practices for certain open-ended consumer loans, such as credit cards, are governed by Federal Financial Institutions Examination Council (FFIEC) guidelines. For open-ended consumer loans subject to FFIEC guidelines, one of the conditions for the loan to be re-aged to current status is that at least three consecutive minimum monthly payments, or the equivalent amount, must be received. In addition, under FFIEC guidelines, the number of times that such a loan can be re-aged is subject to limitations (generally once in 12 months and twice in five years). Furthermore, FHA and Department of Veterans Affairs (VA) loans may only be modified under those respective agencies' guidelines, and payments are not always required in order to re-age a modified loan to current.

Consumer Charge-Off Policies

Citi's charge-off policies follow the general guidelines below:

- Unsecured installment loans are charged off at 120 days contractually past due.
- Unsecured revolving loans and credit card loans are charged off at 180 days contractually past due.
- Loans secured with non-real estate collateral are written down to the estimated value of the collateral, less costs to sell, at 120 days contractually past due.
- Real estate-secured loans are written down to the estimated value of the property, less costs to sell, at 180 days contractually past due.
- Real estate-secured loans are charged off no later than 180 days contractually past due if a decision has been made not to foreclose on the loans.
- Unsecured loans in bankruptcy are charged off within 60 days of notification of filing by the bankruptcy court or in accordance with Citi's charge-off policy, whichever occurs earlier.
- Real estate-secured loans in bankruptcy, other than FHA-insured loans, are written down to the estimated value of the property, less costs to sell, within 60 days of notification that the borrower has filed for bankruptcy or in accordance with Citi's charge-off policy, whichever is earlier.

Corporate Loans

Corporate loans represent loans and leases managed by *Institutional Clients Group (ICG)* and the Mexico SBMM component of *Legacy Franchises*. Corporate loans are identified as impaired and placed on a cash (non-accrual) basis when it is determined, based on actual experience and a forward-looking assessment of the collectability of the loan in full, that the payment of interest or principal is doubtful or when interest or principal is 90 days past due, except when the loan is well collateralized and in the process of collection. Any interest accrued on impaired corporate loans and leases is reversed at 90 days past due and charged against current earnings, and interest is thereafter included in earnings only to the extent actually received in cash. When there is doubt regarding the ultimate collectability of principal, all cash receipts are thereafter applied to reduce the recorded investment in the loan.

Impaired corporate loans and leases are written down to the extent that principal is deemed to be uncollectible. Impaired collateral-dependent loans and leases, where repayment is expected to be provided solely by the sale of the underlying collateral and there are no other available and reliable sources of repayment, are carried at the lower of amortized cost or collateral value. Cash-basis loans are returned to accrual status when all contractual principal and interest amounts are reasonably assured of repayment and there is a sustained period of repayment performance in accordance with the contractual terms.

Loans Held-for-Sale

Corporate and consumer loans that have been identified for sale are classified as loans HFS and included in *Other assets*. The practice of Citi's U.S. prime mortgage business has been to sell substantially all of its conforming loans. As such, U.S. prime mortgage conforming loans are classified as HFS and the fair value option is elected at origination, with changes in fair value recorded in *Other revenue*. With the exception of those loans for which the fair value option has been elected, HFS loans are accounted for at the lower of cost or market value, with any write-downs or subsequent recoveries charged to *Other revenue*. The related cash flows are classified in the Consolidated Statement of Cash Flows in the cash flows from operating activities category on the line *Change in loans HFS*. Gains and losses on loans HFS are generally presented in *Other revenue*. Gains on sales of fully or partially charged-off loans are presented as gross credit recoveries in the *Provision for credit losses* up to the amount of prior charge-offs.

Allowances for Credit Losses (ACL)

Commencing January 1, 2020, Citi adopted ASC 326, *Financial Instruments—Credit Losses*, using the methodologies described below.

The current expected credit losses (CECL) methodology is based on relevant information about past events, including historical experience, current conditions and reasonable and supportable (R&S) forecasts that affect the collectability of the reported financial asset balances. If the asset's life extends beyond the R&S forecast period, then historical experience is considered over the remaining life of the assets in the ACL. The resulting ACL is adjusted in each subsequent reporting period through *Provisions for credit losses* in the Consolidated Statement of Income to reflect changes in history, current conditions and forecasts as well as changes in asset positions and portfolios. ASC 326 defines the ACL as a valuation account that is deducted from the amortized cost of a financial asset to present the net amount that management expects to collect on the financial asset over its expected life. All financial assets carried at amortized cost are in the scope of ASC 326, while assets measured at fair value are excluded. See Note 13 for a discussion of impairment on available-for-sale (AFS) securities.

Increases and decreases to the allowances are recorded in *Provisions for credit losses*. The CECL methodology utilizes a lifetime expected credit loss (ECL) measurement objective for the recognition of credit losses for held-for-investment (HFI) loans, held-to-maturity (HTM) debt securities, receivables and other financial assets measured at amortized cost at the time the financial asset is originated or acquired. Within the life of a loan or other financial asset, the methodology generally results in the earlier recognition of the provision for credit losses and the related ACL than under the prior probable incurred loss model.

Estimation of ECLs requires Citi to make assumptions regarding the likelihood and severity of credit loss events and their impact on expected cash flows, which drive the probability of default (PD), loss given default (LGD) and exposure at default (EAD) models and, where Citi discounts the ECL, using discounting techniques for certain products.

Citi considers a multitude of global macroeconomic variables for the base, upside and downside probability-weighted macroeconomic scenario forecasts it uses to estimate the ACL. Citi's forecasts of the U.S. unemployment rate and U.S. real GDP growth rate represent the key macroeconomic variables that most significantly affect its estimate of the ACL. Under the base macroeconomic forecast as of 4Q22, U.S. real GDP growth is expected to decline during 2023, and the unemployment rate is expected to increase modestly over the forecast horizon, broadly returning to pre-pandemic levels.

The macroeconomic scenario weights are estimated using a statistical model, which, among other factors, takes into consideration key macroeconomic drivers of the ACL, severity of the scenario and other macroeconomic uncertainties and risks. Citi evaluates scenario weights on a quarterly basis.

Citi's downside scenario incorporates more adverse macroeconomic assumptions than the base scenario. For example, compared to the base scenario, Citi's downside scenario reflects a more severe recession, including an elevated average U.S. unemployment rate of 6.9% over the eight-quarter R&S period, with a peak difference of 2.9% in the second quarter of 2024. The downside scenario also reflects a year-over-year U.S. real GDP contraction in 2023 of 2.4%, with a peak quarter-over-quarter difference of 3.3% in the second quarter of 2023.

The following are the main factors and interpretations that Citi considers when estimating the ACL under the CECL methodology:

- CECL reserves are estimated over the contractual term of the financial asset, which is adjusted for expected prepayments. Expected extensions are generally not considered unless the option to extend the loan cannot be canceled unilaterally by Citi. Modifications are also not considered, unless Citi has a reasonable expectation that it will execute a troubled debt restructuring (TDR).
- Credit enhancements that are not freestanding (such as those that are included in the original terms of the contract or those executed in conjunction with the lending transaction) are considered loss mitigants for purposes of CECL reserve estimation.
- For unconditionally cancelable accounts (generally credit cards), reserves are based on the expected life of the balance as of the evaluation date (assuming no further charges) and do not include any undrawn commitments that are unconditionally cancelable. Reserves are included for undrawn commitments for accounts that are not unconditionally cancelable (such as letters of credit and corporate loan commitments, home equity lines of credit (HELOCs), undrawn mortgage loan commitments and financial guarantees).
- CECL models are designed to be economically sensitive. They utilize the macroeconomic forecasts provided by Citi's enterprise scenario group that are approved by senior management. Analysis is performed and documented to determine the necessary qualitative management adjustment (QMA) to capture idiosyncratic events and model uncertainty.
- The portion of the forecast that reflects the enterprise scenario group's R&S period indicates the maximum length of time its models can produce a R&S macroeconomic forecast, after which mean reversion reflecting historical loss experience is used for the remaining life of the loan to estimate expected credit losses. For the loss forecast, businesses consume the macroeconomic forecast as determined to be appropriate and justifiable.

Citi's ability to forecast credit losses over the R&S period is based on the ability to forecast economic activity over a reasonable and supportable time window. The R&S period reflects the overall ability to have a reasonable and supportable forecast of credit loss based on economic forecasts.

- The loss models consume all or a portion of the R&S economic forecast and then revert to historical loss experience. The R&S forecast period for consumer and corporate loans is eight quarters.
- The ACL incorporates provisions for accrued interest on products that are not subject to a non-accrual and timely write-off policy (e.g., credit cards, etc.).
- The reserves for TDRs are calculated using a method that considers discounted cash flows and appropriate macroeconomic forecast data for the exposure type. For TDR loans that are collateral dependent, the ACL is based on the fair value of the collateral.
- Citi uses the most recent available information to inform its macroeconomic forecasts, allowing sufficient time for analysis of the results and corresponding approvals. Key variables are reviewed for significant changes through year end and changes to portfolio positions are reflected in the ACL.
- Reserves are calculated at an appropriately granular level and on a pooled basis where financial assets share risk characteristics. At a minimum, reserves are calculated at a portfolio level (product and country). Where a financial asset does not share risk characteristics with any of the pools, it is evaluated for credit losses individually.

Quantitative and Qualitative Components of the ACL

The loss likelihood and severity models use both internal and external information and are sensitive to forecasts of different macroeconomic conditions. For the quantitative component, Citi uses multiple macroeconomic scenarios and associated probabilities to estimate the ECL. Estimates of these ECLs are based upon (i) Citigroup's internal system of credit risk ratings, (ii) historical default and loss data, including comprehensive internal history and rating agency information regarding default rates and internal data on the severity of losses in the event of default, and (iii) a R&S forecast of future macroeconomic conditions. ECL is determined primarily by utilizing models for the borrowers' PD, LGD and EAD. Adjustments may be made to this data, including (i) statistically calculated estimates to cover the historical fluctuation of the default rates over the credit cycle, the historical variability of loss severity among defaulted loans and the degree to which there are large obligor concentrations in the global portfolio, and (ii) adjustments made for specifically known items, such as current environmental factors and credit trends.

Any adjustments needed to the modeled expected losses in the quantitative calculations are addressed through a qualitative adjustment. The qualitative adjustment considers, among other things: certain portfolio characteristics and concentrations; collateral coverage; model limitations; idiosyncratic events; and other relevant criteria under banking supervisory guidance for the ACL. The qualitative adjustment also reflects the estimated impact of the pandemic on the economic forecasts and the impact on credit loss estimates. The total ACL is composed of the quantitative and qualitative components. Citi's qualitative component declined year-over-year, primarily driven by the incorporation of multiple macroeconomic scenarios in the quantitative component and releases of COVID-19–related uncertainty reserves as the portfolio continues to normalize toward pre-pandemic levels and as these risks are captured in the quantitative component of the ACL. See "Accounting Changes" below for information about how the calculation of the quantitative component of the ACL changed in 2022.

Consumer Loans

For consumer loans, most portfolios including North America cards, mortgages and personal installment loans (PILs) are covered by the PD, LGD and EAD loss forecasting models. Some smaller international portfolios are covered by econometric models where the gross credit loss (GCL) rate is forecasted. The modeling of all retail products is performed by examining risk drivers for a given portfolio; these drivers relate to exposures with similar credit risk characteristics and consider past events, current conditions and R&S forecasts. Under the PD x LGD x EAD approach, GCLs and recoveries are captured on an undiscounted basis. Citi incorporates expected recoveries on loans into its reserve estimate, including expected recoveries on assets previously written off.

CECL defines the exposure's expected life as the remaining contractual maturity including any expected prepayments. Subsequent changes to the contractual terms that are the result of a re-underwriting are not included in the loan's expected CECL life.

Citi does not establish reserves for the uncollectible accrued interest on non-revolving consumer products, such as mortgages and installment loans, which are subject to a non-accrual and timely write-off policy at 90 days past due. As such, only the principal balance is subject to the CECL reserve methodology and interest does not attract a further reserve. Deferred origination costs and fees related to new credit card account originations are amortized within a 12-month period, and an ACL is provided for components in the scope of the ASC.

Separate valuation allowances are determined for impaired smaller-balance homogeneous loans whose terms have been modified in a TDR. Long-term modification programs, and short-term (less than 12 months) modifications that provide concessions (such as interest rate reductions) to borrowers in financial difficulty, are reported as TDRs. In addition, loan modifications that involve a trial period are reported as TDRs at the start of the trial period. The ACL for TDRs is determined using a discounted cash flow (DCF) approach. When a DCF approach is used, the initial allowance for ECLs is calculated as the expected contractual cash flows discounted at the loan's original effective interest rate. DCF techniques are applied for consumer loans only if they are classified as TDR loan exposures.

For credit cards, Citi uses the payment rate approach, which leverages payment rate curves, to determine the payments that should be applied to liquidate the end-of-period balance (CECL balance) in the estimation of EAD. The payment rate approach uses customer payment behavior (payment rate) to establish the portion of the CECL balance that will be paid each month. These payment rates are defined as the percentage of principal payments received in the respective month divided by the prior month's billed principal balance. The liquidation (CECL payment) amount for each forecast period is determined by multiplying the CECL balance by that period's forecasted payment rate. The cumulative sum of these payments less the CECL balance produces the balance liquidation curve. Citi does not apply a non-accrual policy to credit card receivables; rather, they are subject to full charge-off at 180 days past due or bankruptcy. As such, the entire customer balance up until write-off, including accrued interest and fees, is subject to the CECL reserve methodology.

Corporate Loans, HTM Securities and Other assets

Citi records allowances for credit losses on all financial assets carried at amortized cost that are in the scope of CECL, including corporate loans classified as HFI, HTM debt securities and *Other assets*. Discounting techniques are applied for corporate loans classified as HFI and HTM securities and non-accrual/TDR loan exposures. All cash flows are fully discounted to the reporting date. The ACL includes Citi's estimate of all credit losses expected to be incurred over the estimated full contractual life of the financial asset. The contractual life of the financial asset does not include expected extensions, renewals or modifications, except for instances where the Company reasonably expects to extend the tenor of the financial asset pursuant to a future TDR. Where Citi has an unconditional option to extend the contractual term, Citi does not consider the potential extension in determining the contractual term; however, where the borrower has the sole right to exercise the extension option without Citi's approval, Citi does consider the potential extension in determining the contractual term. The decrease in credit losses under CECL at the date of adoption on January 1, 2020, compared with the prior incurred loss methodology, was largely due to more precise contractual maturities that resulted in shorter remaining tenors, the incorporation of recoveries and use of more specific historical loss data based on an increase in portfolio segmentation across industries and geographies.

The Company primarily bases its ACL on models that assess the likelihood and severity of credit events and their impact on cash flows under R&S forecasted economic scenarios. Allowances consider the probability of the borrower's default, the loss the Company would incur upon default and the borrower's exposure at default. Such models discount the present value of all future cash flows, using the asset's effective interest rate (EIR). Citi applies a more simplified approach based on historical loss rates to certain exposures recorded in *Other assets* and certain loan exposures in the private bank within *Consumer loans*.

The Company considers the risk of nonpayment to be zero for U.S. Treasuries and U.S. government-sponsored agency guaranteed mortgage-backed securities (MBS) and, as such, Citi does not have an ACL for these securities. For all other HTM debt securities, ECLs are estimated using PD models and discounting techniques, which incorporate assumptions regarding the likelihood and severity of credit losses. For structured securities, specific models use relevant assumptions for the underlying collateral type. A discounting approach is applied to HTM direct obligations of a single issuer, similar to that used for corporate HFI loans.

Other Financial Assets with Zero Expected Credit Losses

For certain financial assets, zero expected credit losses will be recognized where the expectation of nonpayment of the amortized cost basis is zero, based on there being no history of loss and the nature of the receivables.

Secured Financing Transactions

Most of Citi's reverse repurchase agreements, securities borrowing arrangements and margin loans require that the borrower continually adjust the amount of the collateral securing Citi's interest, primarily resulting from changes in the fair value of such collateral. In such arrangements, ACLs are recorded based only on the amount by which the asset's amortized cost basis exceeds the fair value of the collateral. No ACLs are recorded where the fair value of the collateral is equal to or exceeds the asset's amortized cost basis, as Citi does not expect to incur credit losses on such well-collateralized exposures. For certain margin loans presented in *Loans* on the Consolidated Balance Sheet, ACLL is estimated using the same approach as corporate loans.

Accrued Interest

CECL permits entities to make an accounting policy election not to reserve for interest, if the entity has a policy in place that will result in timely reversal or write-off of interest. However, when a non-accrual or timely charge-off policy is not applied, an ACL is recognized on accrued interest at 90 days past due. For HTM debt securities, Citi established a non-accrual policy that results in timely write-off of accrued interest. For corporate loans, where a timely charge-off policy is used, Citi has elected to recognize an ACL on accrued interest receivable. The LGD models for corporate loans include an adjustment for estimated accrued interest.

Reasonably Expected TDRs

For corporate loans, the reasonable expectation of the TDR concept requires that the contractual life over which ECLs are estimated be extended when a TDR that results in a tenor extension is reasonably expected. Reasonably expected TDRs are included in the life of the asset. A discounting technique or collateral-dependent practical expedient is used for non-accrual and TDR loan exposures that do not share risk characteristics with other loans and are individually assessed. Loans modified in accordance with the CARES Act and bank regulatory guidance are not classified as TDRs.

Purchased Credit-Deteriorated (PCD) Assets

ASC 326 requires entities that have acquired financial assets (such as loans and HTM securities) with an intent to hold, to evaluate whether those assets have experienced a more-than-insignificant deterioration in credit quality since origination. These assets are subject to specialized accounting at initial recognition under CECL. Subsequent measurement of PCD assets will remain consistent with other purchased or originated assets, i.e., non-PCD assets. CECL introduces the notion of PCD assets, which replaces purchased credit impaired (PCI) accounting under prior U.S. GAAP.

CECL requires the estimation of credit losses to be performed on a pool basis unless a PCD asset does not share characteristics with any pool. If certain PCD assets do not meet the conditions for aggregation, those PCD assets should be accounted for separately. This determination must be made at the date the PCD asset is purchased. In estimating ECLs from day 2 onward, pools can potentially be reassembled based upon similar risk characteristics. When PCD assets are pooled, Citi determines the amount of the initial ACL at the pool level. The amount of the initial ACL for a PCD asset represents the portion of the total discount at acquisition that relates to credit and is recognized as a "gross-up" of the purchase price to arrive at the PCD asset's (or pool's) amortized cost. Any difference between the unpaid principal balance and the amortized cost is considered to be related to non-credit factors and results in a discount or premium, which is amortized to interest income over the life of the individual asset (or pool). Direct expenses incurred related to the acquisition of PCD assets and other assets and liabilities in a business combination are expensed as incurred. Subsequent accounting for acquired PCD assets is the same as the accounting for originated assets; changes in the allowance are recorded in *Provisions for credit losses*.

Consumer

Citi does not purchase whole portfolios of PCD assets in its retail businesses. However, there may be a small portion of a purchased portfolio that is identified as PCD at the purchase date. Interest income recognition does not vary between PCD and non-PCD assets. A consumer financial asset is considered to be more-than-insignificantly credit deteriorated if it is more than 30 days past due at the purchase date.

Corporate

Citi generally classifies wholesale loans and debt securities classified as HTM or AFS as PCD when both of the following criteria are met: (i) the purchase price discount is at least 10% of par and (ii) the purchase date is more than 90 days after the origination or issuance date. Citi classifies HTM beneficial interests rated AA- and lower obtained at origination from certain securitization transactions as PCD when there is a significant difference (i.e., 10% or greater) between contractual cash flows, adjusted for prepayments, and expected cash flows at the date of recognition.

Reserve Estimates and Policies

Management provides reserves for an estimate of lifetime ECLs in the funded loan portfolio on the Consolidated Balance Sheet in the form of an ACL. These reserves are established in accordance with Citigroup's credit reserve policies, as approved by the Audit Committee of the Citigroup Board of Directors. Citi's Chief Risk Officer and Chief Financial Officer review the adequacy of the credit loss reserves each quarter with risk management and finance representatives for each applicable business area. Applicable business areas include those having classifiably managed portfolios, where internal credit risk ratings are assigned (primarily *ICG*) and delinquency-managed portfolios (primarily *PBWM*) or modified consumer loans, where concessions were granted due to the borrowers' financial difficulties. The aforementioned representatives for these business areas present recommended reserve balances for their funded and unfunded lending portfolios along with supporting quantitative and qualitative data discussed below.

Estimated Credit Losses for Portfolios of Performing Exposures

Risk management and finance representatives who cover business areas with delinquency-managed portfolios

containing smaller-balance homogeneous loans present their recommended reserve balances based on leading credit indicators, including loan delinquencies and changes in portfolio size as well as economic trends, including current and future housing prices, unemployment, length of time in foreclosure, costs to sell and GDP. This methodology is applied separately for each product within each geographic region in which these portfolios exist. This evaluation process is subject to numerous estimates and judgments.

Risk management and finance representatives who cover business areas with classifiably managed portfolios present their recommended reserve balances based on the frequency of default, risk ratings, loss recovery rates, size and diversity of individual large credits, and ability of borrowers with foreign currency obligations to obtain the foreign currency necessary for orderly debt servicing. Changes in these estimates could have a direct impact on the credit costs in any period and could result in a change in the allowance.

Allowance for Unfunded Lending Commitments

Credit loss reserves are recognized on all off-balance sheet commitments that are not unconditionally cancelable. Corporate loan EAD models include an incremental usage factor (or credit conversion factor) to estimate ECLs on amounts undrawn at the reporting date. Off-balance sheet commitments include unfunded exposures, revolving facilities, securities underwriting commitments, letters of credit, HELOCs and financial guarantees (excluding performance guarantees). This reserve is classified on the Consolidated Balance Sheet in *Other liabilities*. Changes to the allowance for unfunded lending commitments are recorded in *Provision for credit losses on unfunded lending commitments*.

Mortgage Servicing Rights (MSRs)

Mortgage servicing rights (MSRs) are recognized as intangible assets when purchased or when the Company sells or securitizes loans acquired through purchase or origination and retains the right to service the loans. Mortgage servicing rights are accounted for at fair value, with changes in value recorded in *Other revenue* in the Company's Consolidated Statement of Income.

For additional information on the Company's MSRs, see Notes 16 and 21.

Goodwill

Goodwill represents the excess of acquisition cost over the fair value of net tangible and intangible assets acquired in a business combination. Goodwill is subject to annual impairment testing and interim assessments between annual tests if an event occurs or circumstances change that would more-likely-than-not reduce the fair value of a reporting unit below its carrying amount.

Under ASC Topic 350, *Intangibles—Goodwill and Other* and upon the adoption of ASU No. 2017-04 on January 1, 2020, the Company has an option to assess qualitative factors to determine if it is necessary to perform the goodwill impairment test. If, after assessing the totality of events or circumstances, the Company determines that it is not more-likely-than-not that the fair value of a reporting unit is less than its carrying amount, no further testing is necessary. If, however, the Company determines that it is more-likely-than-not that the fair value of a reporting unit is less than its carrying amount, then the Company must perform the quantitative test.

The Company has an unconditional option to bypass the qualitative assessment for any reporting unit in any reporting period and proceed directly to the quantitative test.

The quantitative test requires a comparison of the fair value of the individual reporting unit to its carrying value, including goodwill. If the fair value of the reporting unit is in excess of the carrying value, the related goodwill is considered not impaired and no further analysis is necessary. If the carrying value of the reporting unit exceeds the fair value, an impairment loss is recognized in an amount equal to that excess, limited to the total amount of goodwill allocated to that reporting unit.

Upon any business disposition, goodwill is allocated to, and derecognized with, the disposed business based on the ratio of the fair value of the disposed business to the fair value of the reporting unit.

Additional information on Citi's goodwill impairment testing can be found in Note 16.

Intangible Assets

Intangible assets—including core deposit intangibles, present value of future profits, purchased credit card relationships, credit card contract-related intangibles, other customer relationships and other intangible assets, but excluding MSRs —are amortized over their estimated useful lives. Credit card contract-related intangibles include fixed and unconditional costs incurred to renew or extend the contract with a card partner. In estimating the useful life of a credit card contract-related intangible, the Company considers the probability of contract renewal or extension to determine the period that the asset is expected to contribute future cash flows. Intangible assets that are deemed to have indefinite useful lives, primarily trade names, are not amortized and are subject to annual impairment tests. An impairment exists if the carrying value of the indefinite-lived intangible asset exceeds its fair value. For other intangible assets subject to amortization, an impairment is recognized if the carrying amount is not recoverable and exceeds the fair value of the intangible asset.

Premises and Equipment

Premises and equipment includes lease right-of-use assets, property and equipment (including purchased and developed software), net of depreciation and amortization. Substantially all lease right-of-use assets are amortized on a straight-line basis over the lease term, and substantially all property and equipment is depreciated or amortized on a straight-line basis over the useful life of the asset.

Other Assets and Other Liabilities

Other assets include, among other items, loans HFS, deferred tax assets, equity method investments, interest and fees receivable, repossessed assets, other receivables, and assets from businesses classified as HFS that are reclassified from other balance sheet line items. *Other liabilities* include, among other items, accrued expenses, lease liabilities, deferred tax liabilities, reserves for legal claims and legal fee accruals,

taxes, unfunded lending commitments, repositioning reserves, other payables, and liabilities from businesses classified as HFS that are reclassified from other balance sheet line items. Legal fee accruals are recognized as incurred.

Other Real Estate Owned and Repossessed Assets
Real estate or other assets received through foreclosure or repossession are generally reported in *Other assets*, net of a valuation allowance for selling costs and subsequent declines in fair value.

Securitizations
There are two key accounting determinations that must be made relating to securitizations. Citi first makes a determination as to whether the securitization entity must be consolidated. Second, it determines whether the transfer of financial assets to the entity is considered a sale under GAAP. If the securitization entity is a VIE, the Company consolidates the VIE if it is the primary beneficiary (as discussed in "Variable Interest Entities" above). For all other securitization entities determined not to be VIEs in which Citigroup participates, consolidation is based on which party has voting control of the entity, giving consideration to removal and liquidation rights in certain partnership structures. Only securitization entities controlled by Citigroup are consolidated.

Interests in the securitized and sold assets may be retained in the form of subordinated or senior interest-only strips, subordinated tranches, spread accounts and servicing rights. In credit card securitizations, the Company retains a seller's interest in the credit card receivables transferred to the trusts, which is not in securitized form. In the case of consolidated securitization entities, including the credit card trusts, these retained interests are not reported on Citi's Consolidated Balance Sheet. The securitized loans remain on the balance sheet. Substantially all of the consumer loans sold or securitized through non-consolidated trusts by Citigroup are U.S. prime residential mortgage loans. Retained interests in non-consolidated mortgage securitization trusts are classified as *Trading account assets*, except for MSRs, which are included in *Intangible assets* on Citigroup's Consolidated Balance Sheet.

Debt
Short-term borrowings and *Long-term debt* are accounted for at amortized cost, except where the Company has elected to report the debt instruments (including certain structured notes) at fair value, or debt that is in a fair value hedging relationship. Premiums, discounts and issuance costs on long-term debt accounted for at amortized cost are amortized over the contractual term using the effective interest method.

Transfers of Financial Assets
For a transfer of financial assets to be considered a sale, (i) the assets must be legally isolated from the Company, even in bankruptcy or other receivership, (ii) the purchaser must have the right to pledge or sell the assets transferred (or, if the purchaser is an entity whose sole purpose is to engage in securitization and asset-backed financing activities through the issuance of beneficial interests and that entity is constrained from pledging the assets it receives, each beneficial interest holder must have the right to sell or pledge their beneficial interests) and (iii) the Company may not have an option or obligation to reacquire the assets.

If these sale requirements are met, the assets are removed from the Company's Consolidated Balance Sheet. If the conditions for sale are not met, the transfer is considered to be a secured borrowing, the assets remain on the Consolidated Balance Sheet and the sale proceeds are recognized as the Company's liability. A legal opinion on a sale generally is obtained for complex transactions or where the Company has continuing involvement with assets transferred or with the securitization entity. For a transfer to be eligible for sale accounting, that opinion must state that the asset transfer would be considered a sale and that the assets transferred would not be consolidated with the Company's other assets in the event of the Company's insolvency.

For a transfer of a portion of a financial asset to be considered a sale, the portion transferred must meet the definition of a participating interest. A participating interest must represent a pro rata ownership in an entire financial asset; all cash flows must be divided proportionately, with the same priority of payment; no participating interest in the transferred asset may be subordinated to the interest of another participating interest holder; and no party may have the right to pledge or exchange the entire financial asset unless all participating interest holders agree. Otherwise, the transfer is accounted for as a secured borrowing.

See Note 22 for further discussion.

Risk Management Activities—Derivatives Used for Hedging Purposes
The Company manages its exposures to market movements outside of its trading activities by modifying the asset and liability mix, either directly or through the use of derivative financial products, including interest rate swaps, futures, forwards, purchased options and commodities, as well as foreign-exchange contracts. These end-user derivatives are carried at fair value in *Trading account assets* and *Trading account liabilities*.

See Note 23 for a further discussion of the Company's hedging and derivative activities.

Instrument-Specific Credit Risk
Citi presents separately in *AOCI* the portion of the total change in the fair value of a liability resulting from a change in the instrument-specific credit risk, when the entity has elected to measure the liability at fair value in accordance with the fair value option for financial instruments. Accordingly, the change in fair value of liabilities for which the fair value option was elected, related to changes in Citigroup's own credit spreads, is presented in *AOCI*.

Employee Benefits Expense
Employee benefits expense includes current service costs of pension and other postretirement benefit plans (which are accrued on a current basis), contributions and unrestricted awards under other employee plans, the amortization of restricted stock awards and costs of other employee benefits. For its most significant pension and postretirement benefit plans (Significant Plans), Citigroup measures and discloses

plan obligations, plan assets and periodic plan expense quarterly, instead of annually. The effect of remeasuring the Significant Plan obligations and assets by updating plan actuarial assumptions on a quarterly basis is reflected in *Accumulated other comprehensive income (loss)* and periodic plan expense. All other plans (All Other Plans) are remeasured annually. Benefits earned during the year are reported in *Compensation and benefits expenses* and all other components of the net annual benefit cost are reported in *Other operating expenses* in the Consolidated Statement of Income. See Note 8.

Stock-Based Compensation

The Company recognizes compensation expense related to stock awards over the requisite service period, generally based on the instruments' grant-date fair value, reduced by actual forfeitures as they occur. Compensation cost related to awards granted to employees who meet certain age plus years-of-service requirements (retirement-eligible employees) is accrued in the year prior to the grant date, in the same manner as the accrual for cash incentive compensation. Certain stock awards with performance conditions or certain clawback provisions are subject to variable accounting, pursuant to which the associated compensation expense fluctuates with changes in Citigroup's common stock price. See Note 7.

Income Taxes

The Company is subject to the income tax laws of the U.S. and its states and municipalities, as well as the non-U.S. jurisdictions in which it operates. These tax laws are complex and may be subject to different interpretations by the taxpayer and the relevant governmental taxing authorities. In establishing a provision for income tax expense, the Company must make judgments and interpretations about these tax laws. The Company must also make estimates about when in the future certain items will affect taxable income in the various tax jurisdictions, both domestic and foreign.

Disputes over interpretations of the tax laws may be subject to review and adjudication by the court systems of the various tax jurisdictions or, may be settled with the taxing authority upon examination or audit. The Company treats interest and penalties on income taxes as a component of *Income tax expense*.

Deferred taxes are recorded for the future consequences of events that have been recognized in financial statements or tax returns, based upon enacted tax laws and rates. Deferred tax assets are recognized subject to management's judgment about whether realization is more-likely-than-not. ASC 740, *Income Taxes*, sets out a consistent framework to determine the appropriate level of tax reserves to maintain for uncertain tax positions. This interpretation uses a two-step approach wherein a tax benefit is recognized if a position is more-likely-than-not to be sustained. The amount of the benefit is then measured to be the highest tax benefit that is more than 50% likely to be realized. ASC 740 also sets out disclosure requirements to enhance transparency of an entity's tax reserves.

See Note 9 for a further description of the Company's tax provision and related income tax assets and liabilities.

Commissions, Underwriting and Principal Transactions

Commissions and fees revenues are recognized in income when earned. Underwriting revenues are recognized in income typically at the closing of the transaction. *Principal transactions* revenues are recognized in income on a trade-date basis. See Note 5 for a description of the Company's revenue recognition policies for *Commissions and fees*, and Note 6 for details of *Principal transactions* revenue.

Earnings per Share

Earnings per share (EPS) is calculated using the two-class method. Under the two-class method, all earnings (distributed and undistributed) are allocated to common stock and participating securities. Undistributed earnings are calculated after deducting preferred stock dividends, any issuance cost incurred at the time of issuance of redeemed preferred stock and dividends paid and accrued to common stocks and RSU/DSA share awards. Citi grants restricted and deferred share awards under its shares-based compensation programs, which entitle recipients to receive nonforfeitable dividends during the vesting period on a basis equivalent to dividends paid to holders of the Company's common stock. These unvested awards meet the definition of participating securities based on their respective rights to receive nonforfeitable dividends, and they are treated as a separate class of securities and are not included in computing basic EPS.

Diluted EPS incorporates the potential impact of contingently issuable shares, stock options and awards which require future service as a condition of delivery of the underlying common stock. Anti-dilutive options and warrants are disregarded in the EPS calculations. Diluted EPS is calculated under both the two-class and treasury stock methods, and the more dilutive amount is reported. Participating securities are not included as incremental shares in computing diluted EPS.

Use of Estimates

Management must make estimates and assumptions that affect the Consolidated Financial Statements and the related Notes. Such estimates are used in connection with certain fair value measurements. See Note 25 for further discussions on estimates used in the determination of fair value. Moreover, estimates are significant in determining the amounts of other-than-temporary impairments, impairments of goodwill and other intangible assets, provisions for probable losses that may arise from credit-related exposures, probable and estimable losses related to litigation and regulatory proceedings, and income taxes. While management makes its best judgment, actual amounts or results could differ from those estimates.

Cash Equivalents and Restricted Cash Flows

Cash equivalents are defined as those amounts included in *Cash and due from banks* and *Deposits with banks*. Certain cash balances are restricted by regulatory or contractual requirements. See Note 27 for additional information on restricted cash.

Related Party Transactions
The Company has related party transactions with certain of its subsidiaries and affiliates. These transactions, which are primarily short-term in nature, include cash accounts, collateralized financing transactions, margin accounts, derivative transactions, charges for operational support and the borrowing and lending of funds, and are entered into in the ordinary course of business.

ACCOUNTING CHANGES

Reference Rate Reform
On December 21, 2022, the Financial Accounting Standards Board (FASB) issued ASU No. 2022-06, *Reference Rate Reform (Topic 848): Deferral of the Sunset Date of Topic 848*, which extends the period of time preparers can utilize the reference rate reform relief guidance. In 2020, the FASB issued ASU No. 2020-04, *Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting*, which provides optional guidance to ease the potential burden in accounting for (or recognizing the effects of) reference rate reform on financial reporting. In 2021, the U.K. Financial Conduct Authority (FCA) delayed the intended cessation date of certain tenors of USD LIBOR to June 30, 2023. To ensure the relief in Topic 848 covers the period of time during which a significant number of modifications may take place, the ASU defers the sunset date of Topic 848 from December 31, 2022 to December 31, 2024. The extension allows Citi to transition its remaining contracts and maintain hedge accounting. The ASU was adopted by Citi upon issuance and did not impact financial results in 2022.

Voluntary Change in Goodwill Impairment Assessment Date
During 2022, the Company voluntarily changed its annual goodwill impairment assessment date from July 1 to October 1. See Note 16 for additional information.

Multiple Macroeconomic Scenarios-Based ACL Approach
During the second quarter of 2022, Citi refined its ACL methodology to utilize multiple macroeconomic scenarios to estimate its allowance for credit losses. The ACL was previously estimated using a combination of a single base-case forecast scenario as part of its quantitative component and a component of its qualitative management adjustment that reflects economic uncertainty from downside macroeconomic scenarios. As a result of this change, Citi now explicitly incorporates multiple macroeconomic scenarios—base, upside, and downside—and associated probabilities in the quantitative component when estimating its ACL, while still retaining certain of its qualitative management adjustments.

This refinement represents a "change in accounting estimate" under ASC Topic 250, *Accounting Changes and Error Corrections*, with prospective application beginning in the period of change. This change in accounting estimate resulted in a decrease of approximately $0.3 billion in the allowance for credit losses in the second quarter of 2022, partially offsetting an increase of $0.8 billion in the allowance for credit losses due to the increased macroeconomic uncertainty and other factors in the second quarter of 2022.

Accounting for Deposit Insurance Expenses
During the fourth quarter of 2021, Citi changed its presentation of the deposit insurance costs paid to the Federal Deposit Insurance Corporation (FDIC) and similar foreign regulators. These costs were previously presented within *Interest expense* and, as a result of this change, are now presented within *Other operating expenses*. Citi concluded that this presentation was preferable in Citi's circumstances, as it better reflected the nature of these deposit insurance costs in that these costs do not directly represent interest payments to creditors, but are similar in nature to other payments to regulatory agencies that are accounted for as operating expenses.

This change in income statement presentation represents a "change in accounting principle" under ASC Topic 250, *Accounting Changes and Error Corrections*, with retrospective application to the earliest period presented. This change in accounting principle resulted in a reclassification of $1,207 million, $1,203 million and $781 million of deposit insurance expenses from *Interest expense* to *Other operating expenses*, for the years ended December 31, 2021, 2020 and 2019, respectively. This change had no impact on Citi's net income or the total deposit insurance expense incurred by Citi.

Accounting for Financial Instruments—Credit Losses

Overview
In June 2016, the FASB issued ASU No. 2016-13, *Financial Instruments—Credit Losses (Topic 326)*. The ASU introduced a new credit loss methodology, the CECL methodology, which requires earlier recognition of credit losses while also providing additional disclosure about credit risk. Citi adopted the ASU as of January 1, 2020, which, as discussed below, resulted in an increase in Citi's *Allowance for credit losses* and a decrease to opening *Retained earnings*, net of deferred income taxes, at January 1, 2020.

The CECL methodology utilizes a lifetime "expected credit loss" measurement objective for the recognition of credit losses for loans, HTM debt securities, receivables and other financial assets measured at amortized cost at the time the financial asset is originated or acquired. The ACL is adjusted each period for changes in lifetime expected credit losses. The CECL methodology represents a significant change from prior U.S. GAAP and replaced the prior multiple existing impairment methods, which generally required that a loss be incurred before it was recognized. Within the life cycle of a loan or other financial asset, the methodology generally results in the earlier recognition of the provision for credit losses and the related ACL than prior U.S. GAAP. For available-for-sale debt securities where fair value is less than cost that Citi intends to hold or more-likely-than-not will not be required to sell, credit-related impairment, if any, is recognized through an ACL and adjusted each period for changes in credit risk.

January 1, 2020 CECL Transition (Day 1) Impact
The CECL methodology's impact on expected credit losses, among other things, reflects Citi's view of the current state of the economy, forecasted macroeconomic conditions and quality of Citi's portfolios. At the January 1, 2020 date of

adoption, based on forecasts of macroeconomic conditions and exposures at that time, the aggregate impact to Citi was an approximate $4.1 billion, or an approximate 29%, pretax increase in the *Allowance for credit losses*, along with a $3.1 billion after-tax decrease in *Retained earnings* and a deferred tax asset increase of $1.0 billion. This transition impact reflects (i) a $4.9 billion build to the *Allowance for credit losses* for Citi's consumer exposures, primarily driven by the impact on credit card receivables of longer estimated tenors under the CECL lifetime expected credit loss methodology (loss coverage of approximately 23 months) compared to shorter estimated tenors under the probable loss methodology under prior U.S. GAAP (loss coverage of approximately 14 months), net of recoveries, and (ii) a release of $0.8 billion of reserves primarily related to Citi's corporate net loan loss exposures, largely due to more precise contractual maturities that result in shorter remaining tenors, incorporation of recoveries and use of more specific historical loss data based on an increase in portfolio segmentation across industries and geographies.

Accounting for Variable Post-Charge-Off Third-Party Collection Costs

During the second quarter of 2020, Citi changed its accounting for variable post-charge-off third-party collection costs, whereby these costs were accounted for as an increase in expenses as incurred rather than a reduction in expected credit recoveries. Citi concluded that such a change in the method of accounting is preferable in Citi's circumstances as it better reflects the nature of these collection costs. That is, these costs do not represent reduced payments from borrowers and are similar to Citi's other executory third-party vendor contracts that are accounted for as operating expenses as incurred. As a result of this change, Citi had a consumer ACL release of $426 million in the second quarter of 2020 for its U.S. cards portfolios and $122 million in the third quarter of 2020 for its international portfolios.

In the fourth quarter of 2020, Citi revised the second quarter of 2020 accounting conclusion from a "change in accounting estimate effected by a change in accounting principle" to a "change in accounting principle," which required an adjustment to opening retained earnings rather than net income, with retrospective application to the earliest period presented. Citi considered the guidance in ASC Topic 250, *Accounting Changes and Error Corrections*; ASC Topic 270, *Interim Reporting*; ASC Topic 250-S99-1, *Assessing Materiality*; and ASC Topic 250-S99-23, *Accounting Changes Not Retroactively Applied Due to Immateriality, Considering the Effects of Prior Year Misstatements when Quantifying Misstatements in Current Year Financial Statements*. Citi believes that the effects of the revisions were not material to any previously reported quarterly or annual period. As a result, Citi's full-year and quarterly results were revised to reflect this change as if it were effective as of January 1, 2020 (impacts to 2018 and 2019 were de minimis). Accordingly, Citi recorded an increase to its beginning retained earnings on January 1, 2020 of $330 million and a decrease of $443 million to its ACL. Further, Citi recorded a decrease of $18 million to its provisions for credit losses on loans in the first quarter of 2020 and an increase of $339 million and $122 million to its provisions for credit losses on loans in the second and third quarters of 2020, respectively. In addition, Citi's operating expenses increased by $49 million and $45 million, with a corresponding decrease in net credit losses, in the first and second quarters of 2020, respectively. As a result of these changes, Citi's net income for the year ended December 31, 2020 was $330 million lower, or $0.16 per share lower, than under the previous presentation as a change in accounting estimate effected by a change in accounting principle.

Statement of Cash Flows

In the fourth quarter of 2022, Citi identified that certain 2021 and 2020 cash flows related to purchases of short-term negotiable certificates of deposit (NCD) and maturities of long-term NCDs were misclassified between purchases and maturities of AFS securities within investing activities and cash flows from operating activities, based on its accounting policy during those periods. As such, Citi revised its 2021 and 2020 cash flows within its 2022 Consolidated Statement of Cash Flows, as follows:

	2021			2020		
In millions of dollars	As reported	Revision	As revised	As reported	Revision	As revised
Other, net	$ (1,287)	$ (16,115)	$ (17,402)	$ 4,113	$ (2,897)	$ 1,216
Impact to cash from (used in) operating activities		(16,115)			(2,897)	
AFS purchases	(222,095)	16,115	(205,980)	(307,771)	970	(306,801)
AFS maturities	120,936	—	120,936	109,014	1,927	110,941
Impact to cash from (used in) investing activities		16,115			2,897	

After the revision, there were ($2) billion and ($30) million of net NCD cash flows presented within operating activities for 2021 and 2020, respectively. Citi evaluated the effect of the revision, both qualitatively and quantitatively, and concluded that the impact of the revision was not material.

Subsequently, in the fourth quarter of 2022, Citi voluntarily changed its policy to instead present all short-term NCD cash flows in cash flows from investing activities within *Other, net*. Although immaterial, Citi has adjusted both 2021 and 2020 cash flows within the 2022 Consolidated Statement of Cash Flows in accordance with this change in presentation. After considering the impact of the revision described above, the impact of the change in presentation resulted in immaterial increases in cash flows from operating activities and corresponding decreases in cash flows from investing activities of $2 billion and $30 million in 2021 and 2020, respectively.

FUTURE ACCOUNTING CHANGES

TDRs and Vintage Disclosures

In March 2022, the FASB issued ASU No. 2022-02, *Financial Instruments—Credit Losses (Topic 326): Troubled Debt Restructurings and Vintage Disclosures*. Citi adopted the ASU on January 1, 2023. The ASU eliminates the accounting and disclosure requirements for TDRs, including the requirement to measure the ACLL for TDRs using a discounted cash flow (DCF) approach. Citi adopted the guidance on the recognition and measurement of TDRs under the modified retrospective approach. Upon adoption, Citi discontinued the use of a DCF approach for consumer loans formerly considered TDRs. Beginning January 1, 2023, Citi measured the ACLL for all consumer loans under approaches that do not incorporate discounting, primarily utilizing models that consider the borrowers' probability of default, loss given default and exposure at default. This change resulted in a decrease to the ACLL and deferred tax assets of approximately $350 million and $100 million, respectively, and an increase to retained earnings and other assets of approximately $300 million and $50 million, respectively, on January 1, 2023. The ACLL for corporate loans was unaffected because the measurement approach used for corporate loans is not in the scope of this ASU.

The ASU also requires disclosure of modifications of loans to borrowers experiencing financial difficulty if the modification involves principal forgiveness, an interest rate reduction, an other-than-insignificant payment delay, a term extension or a combination of those types of modifications. In addition, the ASU requires the disclosure of current-period gross write-offs by year of loan origination (vintage). The amendments related to disclosures are required to be applied prospectively beginning as of the date of adoption. Citi will present the new disclosures for periods beginning on and after January 1, 2023.

Fair Value Hedging—Portfolio Layer Method

In March 2022, the FASB issued ASU No. 2022-01, *Derivatives and Hedging (Topic 815): Fair Value Hedging—Portfolio Layer Method*, intended to better align hedge accounting with an organization's risk management strategies. Specifically, the guidance expands the current single-layer method to allow multiple hedge layers of a single closed portfolio of qualifying assets, which include both prepayable and non-prepayable assets. Upon the adoption of the guidance, entities may elect to reclassify securities held-to-maturity to the available-for-sale category provided that the reclassified securities are designated in a portfolio hedge. Coincident with the adoption of this ASU, on January 1, 2023, Citi transferred HTM mortgage-backed securities with an amortized cost and fair value of approximately $3.3 billion and $3.4 billion, respectively, into AFS as permitted under the guidance, and hedged them under the portfolio layer method.

Fair Value Measurement of Equity Securities Subject to Contractual Sale Restrictions

In June 2022, the FASB issued ASU No. 2022-3, *Fair Value Measurement (Topic 820): Fair Value Measurement of Equity Securities Subject to Contractual Sale Restrictions*. The ASU was issued to address diversity in practice whereby certain entities included the impact of contractual restrictions when valuing equity securities, and it clarifies that a contractual restriction on the sale of an equity security should not be considered part of the unit of account of the equity security and, therefore, should not be considered in measuring fair value. The ASU also includes requirements for entities to disclose the fair value of equity securities subject to contractual sale restrictions, the nature and remaining duration of the restrictions and the circumstances that could cause a lapse in the restrictions.

The ASU is to be adopted on a prospective basis and will be effective for Citi on January 1, 2024, although early adoption is permitted. Adoption of the accounting standard is not expected to have an impact on Citi's operating results or financial position, as the Company excludes such restrictions when valuing equity securities.

Long-Duration Insurance Contracts

In August 2018, the FASB issued ASU No. 2018-12, *Financial Services—Insurance: Targeted Improvements to the Accounting for Long-Duration Contracts*, which changes the existing recognition, measurement, presentation and disclosures for long-duration contracts issued by an insurance entity. Specifically, the guidance (i) improves the timeliness of recognizing changes in the liability for future policy benefits and prescribes the rate used to discount future cash flows for long-duration insurance contracts, (ii) simplifies and improves the accounting for certain market-based options or guarantees associated with deposit (or account balance) contracts, (iii) simplifies the amortization of deferred acquisition costs and (iv) introduces additional quantitative and qualitative disclosures. Citi has certain insurance subsidiaries, primarily in Mexico, that issue long-duration insurance contracts such as traditional life insurance policies and life-contingent annuity contracts that are impacted by the requirements of ASU 2018-12.

The effective date of ASU 2018-12 was deferred for all insurance entities by ASU 2019-09, *Finance Services—Insurance: Effective Date* (issued in October 2019) and by ASU 2020-11, *Financial Services—Insurance: Effective Date and Early Application* (issued in November 2020). Citi adopted the targeted improvements in ASU 2018-12 on January 1, 2023. There was no material impact to Citi's financial position upon adoption, and Citi expects no material impact to its results of operations as a result of adopting the amendments.

2. DISCONTINUED OPERATIONS, SIGNIFICANT DISPOSALS AND OTHER BUSINESS EXITS

Summary of Discontinued Operations

The Company's results from *Discontinued operations* consisted of residual activities related to the sales of the Egg Banking plc credit card business in 2011 and the German retail banking business in 2008. All *Discontinued operations* results are recorded within *Corporate/Other*.

The following table summarizes financial information for all *Discontinued operations*:

In millions of dollars	**2022**	2021	2020
Total revenues, net of interest expense	**$ (260)**	$ —	$ —
Income (loss) from discontinued operations	**$ (272)**	$ 7	$ (20)
Benefit for income taxes	**(41)**	—	—
Income (loss) from discontinued operations, net of taxes	**$ (231)**	$ 7	$ (20)

During 2022, the Company settled certain liabilities related to its legacy consumer operation in the U.K. (the legacy operation), including an indemnification liability related to its sale of the Egg Banking business in 2011, which led to the substantial liquidation of the legacy operation. As a result, a CTA loss (net of hedges) in *AOCI* of approximately $400 million pretax ($345 million after-tax) related to the legacy operation was released to earnings in 2022. Out of the total CTA release, a $260 million pretax loss ($221 million after-tax loss) was attributable to the Egg Banking business noted above, reported in *Discontinued operations* and, therefore, the corresponding CTA release was also reported in *Discontinued operations* during 2022. The remaining CTA release of a $140 million pretax loss ($124 million after-tax loss) related to Legacy Holdings Assets was reported as part of *Continuing operations* within *Legacy Franchises*.

While the legacy operation was divested in multiple sales over the years, each transaction did not result in substantial liquidation given that Citi retained certain liabilities noted above, which were gradually settled over time until reaching the point of substantial liquidation during 2022, triggering the release of the CTA loss to earnings.

Cash flows from *Discontinued operations* were not material for any period presented.

Significant Disposals

As of December 31, 2022, Citi had entered into sale agreements for nine consumer banking businesses within *Legacy Franchises*. Australia closed in the second quarter of 2022, the Philippines closed in the third quarter of 2022, and Bahrain, Malaysia and Thailand each closed in the fourth quarter of 2022. Entry of sale agreements for the other four consumer banking businesses has resulted in the reclassification to HFS on the Consolidated Balance Sheet of approximately $20 billion in assets within *Other assets*, including approximately $12 billion of loans (net of allowance of $164 million), and approximately $17 billion in liabilities within *Other liabilities*, including approximately $16 billion in deposits. Of the nine sale agreements, the five below were identified as significant disposals as of December 31, 2022. The Taiwan and India sales have yet to close and are subject to regulatory approvals and other closing conditions, as are the potential sales of the Poland and Mexico consumer banking businesses.

			December 31, 2022									
In millions of dollars			Assets						Liabilities			
Consumer banking business in	Sale agreement date	Expected close	Cash and deposits with banks	Loans[1]	Goodwill	Other assets, advances to/from subsidiaries	Other assets	Total assets	Deposits	Long-term debt	Other liabilities	Total liabilities
Australia[2]	8/9/21	closed 6/1/2022	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Philippines[3]	12/23/21	closed 8/1/2022	—	—	—	—	—	—	—	—	—	—
Thailand[4]	1/14/22	closed 11/1/2022	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
Taiwan[5]	1/28/22	second half 2023	123	7,865	202	4,758	198	13,146	10,049	—	237	10,286
India[5]	3/30/22	first half 2023	25	3,423	329	1,924	114	5,815	5,266	—	204	5,470

	Income (loss) before taxes[6]		
In millions of dollars	2022	2021	2020
Australia[2]	$ 193	$ 306	$ 181
Philippines[3]	72	145	42
Thailand[4]	122	139	93
Taiwan	140	282	311
India	194	213	117

(1) Loans, net of allowance as of December 31, 2022 includes $64 million and $37 million for Taiwan and India, respectively.

(2) On June 1, 2022, Citi completed the sale of its Australia consumer banking business, which was part of *Legacy Franchises*. The business had approximately $9.4 billion in assets, including $9.3 billion of loans (net of allowance of $140 million) and excluding goodwill. The total amount of liabilities was $7.3 billion including $6.8 billion in deposits. The transaction generated a pretax loss on sale of approximately $760 million ($640 million after-tax), subject to closing adjustments, recorded in *Other revenue*. The loss on sale primarily reflected the impact of an approximate pretax $620 million CTA loss (net of hedges) ($470 million after-tax) already reflected in the *AOCI* component of equity. The sale closed on June 1, 2022, and the CTA-related balance was removed from *AOCI*, resulting in a neutral CTA impact to Citi's CET1 Capital. The income before taxes shown in the above table for Australia reflects Citi's ownership through June 1, 2022.

(3) On August 1, 2022, Citi completed the sale of its Philippines consumer banking business, which was part of *Legacy Franchises*. The business had approximately $1.8 billion in assets, including $1.2 billion of loans (net of allowance of $80 million) and excluding goodwill. The total amount of liabilities was $1.3 billion, including $1.2 billion in deposits. The sale resulted in a pretax gain on sale of approximately $618 million ($290 million after-tax), subject to closing adjustments, recorded in *Other revenue*. The income before taxes shown in the above table for the Philippines reflects Citi's ownership through August 1, 2022.

(4) On November 1, 2022, Citi completed the sale of its Thailand consumer banking business, which was part of *Legacy Franchises*. The business had approximately $2.7 billion in assets, including $2.4 billion of loans (net of allowance of $67 million) and excluding goodwill. The total amount of liabilities was $1.0 billion, including $0.8 billion in deposits. The sale resulted in a pretax gain on sale of approximately $209 million ($115 million after-tax), subject to closing adjustments, recorded in *Other revenue*. The income before taxes shown in the above table for Thailand reflects Citi's ownership through November 1, 2022.

(5) These sales are expected to result in an after-tax gain upon closing.

(6) Income before taxes for the period in which the individually significant component was classified as HFS for all prior periods presented. For Australia, excludes the pretax loss on sale. For the Philippines and Thailand, excludes the pretax gain on sale.

Citi did not have any other significant disposals as of December 31, 2022.

For a description of the Company's significant disposal transactions in prior periods and financial impact, see Note 2 to the Consolidated Financial Statements in Citi's 2021 Form 10-K.

Other Business Exits

Wind-Down of Korea Consumer Banking Business

On October 25, 2021, Citi disclosed its decision to wind down and close its Korea consumer banking business, which is reported in the *Legacy Franchises* operating segment. In connection with the announcement, Citibank Korea Inc. (CKI) commenced a voluntary early termination program (Korea VERP). Due to the voluntary nature of this termination program, no liabilities for termination benefits are recorded until CKI makes formal offers to employees that are then irrevocably accepted by those employees. Related charges are recorded as *Compensation and benefits*.

During the first quarter of 2022, Citi recorded an additional pretax charge of $31 million, composed of gross charges connected to the Korea VERP.

The following table summarizes the reserve charges related to the Korea VERP and other initiatives reported in the *Legacy Franchises* operating segment and *Corporate/Other*:

In millions of dollars		Employee termination costs
Total Citigroup (pretax)		
Original charges in fourth quarter 2021	$	1,052
Utilization		(1)
Foreign exchange		3
Balance at December 31, 2021	$	1,054
Additional charges in first quarter 2022	$	31
Utilization		(347)
Foreign exchange		(24)
Balance at March 31, 2022	$	714
Additional charges (releases)	$	(3)
Utilization		(670)
Foreign exchange		(41)
Balance at June 30, 2022	$	—
Additional charges (releases)	$	—
Utilization		—
Foreign exchange		—
Balance at September 30, 2022	$	—

The total estimated cash charges for the wind-down are $1.1 billion, most of which were recognized in 2021.

See Note 8 for details on the pension impact of the Korea wind-down.

Wind-Down of Russia Consumer and Institutional Banking Businesses

On August 25, 2022, Citi announced its decision to wind down its consumer banking and local commercial banking operations in Russia. As part of the wind-down, Citi is also actively pursuing sales of certain Russian consumer banking portfolios.

On October 14, 2022, Citi disclosed that it will be ending nearly all of the institutional banking services it offers in Russia by the end of the first quarter of 2023. Going forward, Citi's only operations in Russia will be those necessary to fulfill its remaining legal and regulatory obligations.

On December 12, 2022, Citi completed the sale of a portfolio of ruble-denominated personal installment loans, totaling approximately $240 million in outstanding loan balances, to Uralsib, a Russian commercial bank, resulting in a pretax net loss of approximately $12 million. The net loss on sale of the loan portfolio included a $32 million adjustment to record the loans at lower of cost or fair value recognized in *Other revenue*. In addition, the sale of the loans resulted in a release in the allowance for credit losses on loans of approximately $20 million recognized in the *Provision for credit losses on loans*.

In connection with the portfolio sale, Citi also entered into a referral agreement to transfer to Uralsib a portfolio of ruble-denominated credit card loans, subject to customer consents. The outstanding card loans balance was approximately $219 million as of the fourth quarter of 2022. Citi will refer credit card customers, who at the customers' sole discretion will be eligible to refinance their outstanding card loan balances with Uralsib.

During 2022, Citi recorded a pretax charge of approximately $28 million as *Compensation and benefits* composed of severance costs reported in the *Legacy Franchises* operating segment and *Institutional Clients Group*.

In connection with the wind-down plans of the Russia consumer and institutional banking businesses, Citi expects to incur approximately $190 million in costs, primarily through 2024, largely driven by restructuring, vendor termination fees and other related charges. These costs do not include the impact of any potential portfolio sales.

3. OPERATING SEGMENTS

Effective January 1, 2022, Citi changed its management structure resulting in changes in its operating segments and reporting units to reflect how the CEO, who is the chief operating decision maker, manages the Company, including allocating resources and measuring performance. Citi reorganized its reporting into three operating segments: *Institutional Clients Group (ICG)*, *Personal Banking and Wealth Management (PBWM)* and *Legacy Franchises*, with *Corporate/Other* including activities not assigned to a specific operating segment, as well as discontinued operations. The prior-period balances reflect reclassifications to conform the presentation in those periods to the current operating segment structure. Citi's consolidated results were not impacted by the changes discussed above and remain unchanged for all periods presented.

ICG consists of Services, Markets and Banking, providing corporate, institutional and public sector clients around the world with a full range of wholesale banking products and services.

PBWM consists of U.S. Personal Banking and Global Wealth Management (Global Wealth), providing traditional banking services and credit cards to retail and small business customers in the U.S., and financial services to clients from affluent to ultra-high-net-worth through banking, lending, mortgages, investment, custody and trust product offerings in 20 countries, including the U.S., Mexico and the four wealth management centers: Singapore, Hong Kong, the UAE and London.

Legacy Franchises consists of Asia Consumer and Mexico Consumer/SBMM businesses that Citi intends to exit, and its remaining Legacy Holdings Assets.

Corporate/Other includes activities not assigned to the operating segments, including certain unallocated costs of global functions, other corporate expenses and net treasury results, offsets to certain line-item reclassifications and eliminations, and unallocated taxes, as well as discontinued operations.

Revenues and expenses directly associated with each respective business segment or component are included in determining respective operating results. Other revenues and expenses that are not directly attributable to a particular business segment or component are generally allocated from *Corporate/Other* based on respective net revenues, non-interest expenses or other relevant measures.

As a result of revenues and expenses from transactions with other operating segments or component being treated as transactions with external parties for purposes of segment disclosures, the Company includes intersegment eliminations within *Corporate/Other* to reconcile the business segment results to Citi's consolidated results.

The accounting policies of these operating segments are the same as those disclosed in Note 1.

The following table presents certain information regarding the Company's continuing operations by operating segment and *Corporate/Other*:

In millions of dollars, except identifiable assets, average loans and average deposits in billions	ICG			PBWM			Legacy Franchises			Corporate/Other			Total Citi		
	2022	2021	2020	**2022**	2021	2020	**2022**	2021	2020	**2022**	2021	2020	**2022**	2021	2020
Net interest income	**$17,911**	$14,999	$15,750	**$22,656**	$20,646	$22,326	**$5,691**	$6,250	$6,973	**$2,410**	$ 599	$ (298)	**$48,668**	$42,494	$44,751
Non-interest revenue	**23,295**	24,837	25,343	**1,561**	2,681	2,814	**2,781**	2,001	2,481	**(967)**	(129)	112	**26,670**	29,390	30,750
Total revenues, net of interest expense[1]	**$41,206**	$39,836	$41,093	**$24,217**	$23,327	$25,140	**$8,472**	$8,251	$9,454	**$1,443**	$ 470	$ (186)	**$75,338**	$71,884	$75,501
Operating expense	**26,299**	23,949	22,336	**16,258**	14,610	13,599	**7,782**	8,259	6,890	**953**	1,375	1,549	**51,292**	48,193	44,374
Provisions for credit losses	**911**	(2,490)	4,869	**3,754**	(1,224)	9,885	**571**	(62)	2,739	**3**	(2)	2	**5,239**	(3,778)	17,495
Income (loss) from continuing operations before taxes	**$13,996**	$18,377	$13,888	**$ 4,205**	$ 9,941	$ 1,656	**$ 119**	$ 54	$ (175)	**$ 487**	$ (903)	$(1,737)	**$18,807**	$27,469	$13,632
Provision (benefits) for income taxes	**3,258**	4,069	3,077	**886**	2,207	334	**128**	63	(33)	**(630)**	(888)	(853)	**3,642**	5,451	2,525
Income (loss) from continuing operations	**$10,738**	$14,308	$10,811	**$ 3,319**	$ 7,734	$ 1,322	**$ (9)**	$ (9)	$ (142)	**$1,117**	$ (15)	$ (884)	**$15,165**	$22,018	$11,107
Identifiable assets at December 31[2]	**$ 1,730**	$ 1,613	$ 1,592	**$ 494**	$ 464	$ 453	**$ 97**	$ 125	$ 131	**$ 96**	$ 89	$ 84	**$ 2,417**	$ 2,291	$ 2,260
Average loans	**291**	287	298	**321**	307	304	**41**	74	83	**—**	—	—	**653**	668	685
Average deposits	**830**	828	780	**435**	417	358	**52**	82	81	**16**	8	11	**1,333**	1,335	1,230

(1) Includes total Citi revenues, net of interest expense (excluding *Corporate/Other*), in North America of $34.4 billion, $34.4 billion and $37.1 billion; in EMEA of $14.9 billion, $13.4 billion and $13.4 billion; in Latin America of $9.9 billion, $9.2 billion and $9.4 billion; and in Asia of $14.7 billion, $14.4 billion and $15.8 billion in 2022, 2021 and 2020, respectively. These regional numbers exclude *Corporate/Other*, which largely reflects U.S. activities.

(2) Includes total Citi identifiable assets (excluding *Corporate/Other*), in North America of $776 billion, $709 billion and $741 billion; in EMEA of $773 billion, $742 billion and $684 billion; in Latin America of $184 billion, $179 billion and $180 billion; and in Asia of $588 billion, $572 billion and $572 billion in 2022, 2021 and 2020, respectively. These regional numbers exclude *Corporate/Other*, which largely reflects U.S. activities. The Company's long-lived assets for the periods presented are not considered to be significant in relation to its total assets. The majority of Citi's long-lived assets are located in the U.S.

4. INTEREST REVENUE AND EXPENSE

Interest revenue and *Interest expense* consisted of the following:

In millions of dollars	**2022**	2021	2020
Interest revenue			
Consumer loans	$ **28,391**	$ 26,408	$ 27,763
Corporate loans	**12,851**	9,032	12,422
Loan interest, including fees	$ **41,242**	$ 35,440	$ 40,185
Deposits with banks	**4,515**	577	928
Securities borrowed and purchased under agreements to resell	**7,154**	1,052	2,283
Investments, including dividends	**11,214**	7,388	7,989
Trading account assets[1]	**7,418**	5,365	6,125
Other interest-bearing assets[2]	**2,865**	653	579
Total interest revenue	$ **74,408**	$ 50,475	$ 58,089
Interest expense			
Deposits	$ **11,559**	$ 2,896	$ 5,334
Securities loaned and sold under agreements to repurchase	**4,455**	1,012	2,077
Trading account liabilities[1]	**1,437**	482	628
Short-term borrowings and other interest-bearing liabilities[3]	**2,488**	121	630
Long-term debt	**5,801**	3,470	4,669
Total interest expense	$ **25,740**	$ 7,981	$ 13,338
Net interest income	$ **48,668**	$ 42,494	$ 44,751
Provision (benefit) for credit losses on loans	**4,745**	(3,103)	15,922
Net interest income after provision for credit losses on loans	$ **43,923**	$ 45,597	$ 28,829

(1) Interest expense on *Trading account liabilities* of *ICG* is reported as a reduction of *Interest revenue*. *Interest revenue* and *Interest expense* on cash collateral positions are reported in interest on *Trading account assets* and *Trading account liabilities*, respectively.
(2) Includes assets from businesses held-for-sale (see Note 2) and *Brokerage receivables*.
(3) Includes liabilities from businesses held-for-sale (see Note 2) and *Brokerage payables*.

5. COMMISSIONS AND FEES; ADMINISTRATION AND OTHER FIDUCIARY FEES

Commissions and Fees

The primary components of *Commissions and fees* revenue are investment banking fees, brokerage commissions, credit card and bank card income and deposit-related fees.

Investment banking fees are substantially composed of underwriting and advisory revenues. Such fees are recognized at the point in time when Citigroup's performance under the terms of a contractual arrangement is completed, which is typically at the closing of a transaction. Reimbursed expenses related to these transactions are recorded as revenue and are included within investment banking fees. In certain instances for advisory contracts, Citi will receive amounts in advance of the deal's closing. In these instances, the amounts received will be recognized as a liability and not recognized in revenue until the transaction closes. For the periods presented, the contract liability amount was negligible.

Out-of-pocket expenses associated with underwriting activity are deferred and recognized at the time the related revenue is recognized, while out-of-pocket expenses associated with advisory arrangements are expensed as incurred. In general, expenses incurred related to investment banking transactions, whether consummated or not, are recorded in *Other operating expenses*. The Company has determined that it acts as principal in the majority of these transactions and therefore presents expenses gross within *Other operating expenses*.

Brokerage commissions primarily include commissions and fees from the following: executing transactions for clients on exchanges and over-the-counter markets; sales of mutual funds and other annuity products; and assisting clients in clearing transactions, providing brokerage services and other such activities. Brokerage commissions are recognized in *Commissions and fees* at the point in time the associated service is fulfilled, generally on the trade execution date. Sales of certain investment products include a portion of variable consideration associated with the underlying product. In these instances, a portion of the revenue associated with the sale of the product is not recognized until the variable consideration becomes fixed and determinable. The Company recognized $538 million, $639 million and $495 million of revenue related to such variable consideration for the years ended December 31, 2022, 2021 and 2020, respectively. These amounts primarily relate to performance obligations satisfied in prior periods.

Credit card and bank card income is primarily composed of interchange fees, which are earned by card issuers based on purchase sales, and certain card fees, including annual fees. Costs related to customer reward programs and certain payments to partners (primarily based on program sales, profitability and customer acquisitions) are recorded as a reduction of credit card and bank card income. Citi's credit card programs have certain partner sharing agreements that vary by partner. These partner sharing agreements are subject to contractually based performance thresholds that, if met, would require Citi to make ongoing payments to the partner. The threshold is based on the profitability of a program and is generally calculated based on predefined program revenues less predefined program expenses. In most of Citi's partner sharing agreements, program expenses include net credit losses, which, to the extent that the increase in net credit losses reduces Citi's liability for the partners' share for a given program year, would generally result in lower payments to partners in total for that year and vice versa. Further, in some instances, other partner payments are based on program sales and new account acquisitions. Interchange revenues are recognized as earned on a daily basis when Citi's performance obligation to transmit funds to the payment networks has been satisfied. Annual card fees, net of origination costs, are deferred and amortized on a straight-line basis over a 12-month period. Costs related to card reward programs are recognized when the rewards are earned by the cardholders. Payments to partners are recognized when incurred.

Deposit-related fees consist of service charges on deposit accounts and fees earned from performing cash management activities and other deposit account services. Such fees are recognized in the period in which the related service is provided.

Transactional service fees primarily consist of fees charged for processing services such as cash management, global payments, clearing, international funds transfer and other trade services. Such fees are recognized as/when the associated service is satisfied, which normally occurs at the point in time the service is requested by the customer and provided by Citi.

Insurance distribution revenue consists of commissions earned from third-party insurance companies for marketing and selling insurance policies on behalf of such entities. Such commissions are recognized in *Commissions and fees* at the point in time the associated service is fulfilled, generally when the insurance policy is sold to the policyholder. Sales of certain insurance products include a portion of variable consideration associated with the underlying product. In these instances, a portion of the revenue associated with the sale of the policy is not recognized until the variable consideration becomes fixed and determinable. The Company recognized $201 million, $260 million and $290 million of revenue related to such variable consideration for the years ended December 31, 2022, 2021 and 2020, respectively. These amounts primarily relate to performance obligations satisfied in prior periods.

Insurance premiums consist of premium income from insurance policies that Citi has underwritten and sold to policyholders.

The following table presents *Commissions and fees* revenue:

In millions of dollars	2022 ICG	2022 PBWM	2022 LF	2022 Total	2021 ICG	2021 PBWM	2021 LF	2021 Total	2020 ICG	2020 PBWM	2020 LF	2020 Total
Investment banking	$ 3,084	$ —	$ —	$ 3,084	$ 6,007	$ —	$ —	$ 6,007	$ 4,483	$ —	$ —	$ 4,483
Brokerage commissions	1,570	767	209	2,546	1,770	1,035	431	3,236	1,700	874	386	2,960
Credit and bank card income												
Interchange fees	1,207	9,452	846	11,505	817	8,119	885	9,821	704	6,526	774	8,004
Card-related loan fees	44	256	289	589	27	292	376	695	22	241	386	649
Card rewards and partner payments[1]	(625)	(11,133)	(578)	(12,336)	(405)	(9,296)	(534)	(10,235)	(380)	(7,688)	(605)	(8,673)
Deposit-related fees[2]	1,061	157	56	1,274	1,034	196	101	1,331	936	255	143	1,334
Transactional service fees	1,057	17	95	1,169	968	22	108	1,098	857	20	97	974
Corporate finance[3]	454	4	—	458	705	4	—	709	453	4	—	457
Insurance distribution revenue	—	217	129	346	—	309	164	473	—	318	185	503
Insurance premiums	—	4	87	91	—	10	84	94	—	6	119	125
Loan servicing	39	48	16	103	43	38	17	98	80	28	29	137
Other	20	185	141	346	20	186	139	345	15	300	117	432
Total commissions and fees[4]	$ 7,911	$ (26)	$ 1,290	$ 9,175	$ 10,986	$ 915	$ 1,771	$ 13,672	$ 8,870	$ 884	$ 1,631	$ 11,385

(1) Citi's consumer credit card programs have certain partner sharing agreements that vary by partner. These agreements are subject to contractually based performance thresholds that, if met, would require Citi to make ongoing payments to the partner. The threshold is based on the profitability of a program and is generally calculated based on predefined program revenues less predefined program expenses. In most of Citi's partner sharing agreements, program expenses include net credit losses and, to the extent that an increase in net credit losses reduces Citi's liability for the partners' share for a given program year, would generally result in lower payments to partners in total for that year and vice versa. Further, in some instances, other partner payments are based on program sales and new account acquisitions.

(2) Includes overdraft fees of $59 million (prior to the elimination of overdraft fees in June 2022), $107 million and $100 million for the years ended December 31, 2022, 2021 and 2020, respectively. Overdraft fees are accounted for under ASC 310. Citi eliminated overdraft fees, returned item fees and overdraft protection fees beginning in June 2022.

(3) Consists primarily of fees earned from structuring and underwriting loan syndications or related financing activity. This activity is accounted for under ASC 310.

(4) *Commissions and fees* include $(11,008) million, $(8,516) million and $(7,160) million not accounted for under ASC 606, *Revenue from Contracts with Customers*, for the years ended December 31, 2022, 2021 and 2020, respectively. Amounts reported in *Commissions and fees* accounted for under other guidance primarily include card-related loan fees, card reward programs and certain partner payments, corporate finance fees, insurance premiums and loan servicing fees.

LF *Legacy Franchises*

Administration and Other Fiduciary Fees

Administration and other fiduciary fees revenue is primarily composed of custody fees and fiduciary fees.

The custody product is composed of numerous services related to the administration, safekeeping and reporting for both U.S. and non-U.S. denominated securities. The services offered to clients include trade settlement, safekeeping, income collection, corporate action notification, record-keeping and reporting, tax reporting and cash management. These services are provided for a wide range of securities, including but not limited to equities, municipal and corporate bonds, mortgage- and asset-backed securities, money market instruments, U.S. Treasuries and agencies, derivative instruments, mutual funds, alternative investments and precious metals. Custody fees are recognized as or when the associated promised service is satisfied, which normally occurs at the point in time the service is requested by the customer and provided by Citi.

Fiduciary fees consist of trust services and investment management services. As an escrow agent, Citi receives, safekeeps, services and manages clients' escrowed assets, such as cash, securities, property (including intellectual property), contracts or other collateral. Citi performs its escrow agent duties by safekeeping the assets during the specified time period agreed upon by all parties and therefore earns its revenue evenly during the contract duration.

Investment management services consist of managing assets on behalf of Citi's retail and institutional clients. Revenue from these services primarily consists of asset-based fees for advisory accounts, which are based on the market value of the client's assets and recognized monthly, when the market value is fixed. In some instances, the Company contracts with third-party advisors and with third-party custodians. The Company has determined that it acts as principal in the majority of these transactions and therefore presents the amounts paid to third parties gross within *Other operating expenses*.

The following table presents *Administration and other fiduciary fees* revenue:

	2022				2021				2020			
In millions of dollars	**ICG**	**PBWM**	**LF**	**Total**	ICG	PBWM	LF	Total	ICG	PBWM	LF	Total
Custody fees[1]	**$ 1,781**	**$ 87**	**$ 9**	**$ 1,877**	$ 1,793	$ 91	$ 14	$ 1,898	$ 1,557	$ 80	$ 20	$ 1,657
Fiduciary fees	**284**	**752**	**314**	**1,350**	250	778	436	1,464	234	623	417	1,274
Guarantee fees	**508**	**43**	**6**	**557**	528	45	8	581	495	38	8	541
Total administration and other fiduciary fees[2]	**$ 2,573**	**$ 882**	**$ 329**	**$ 3,784**	$ 2,571	$ 914	$ 458	$ 3,943	$ 2,286	$ 741	$ 445	$ 3,472

(1) *ICG* in 2020 includes $38 million related to *Corporate/Other*.

(2) *Administration and other fiduciary fees* include $557 million, $581 million and $541 million for the years ended December 31, 2022, 2021 and 2020, respectively, that are not accounted for under ASC 606, *Revenue from Contracts with Customers*. These generally include guarantee fees.

LF *Legacy Franchises*

6. PRINCIPAL TRANSACTIONS

Principal transactions revenue consists of realized and unrealized gains and losses from trading activities. Trading activities include revenues from fixed income, equities, credit and commodities products and foreign exchange transactions that are managed on a portfolio basis and characterized below based on the primary risk managed by each trading desk (as such, the trading desks can be periodically reorganized and thus the risk categories). Not included in the table below is the impact of net interest income related to trading activities, which is an integral part of trading activities' profitability (see Note 4 for information about net interest income related to trading activities). Principal transactions include CVA (credit valuation adjustments) and FVA (funding valuation adjustments) on over-the-counter derivatives, and gains (losses) on certain economic hedges on loans in *ICG*. These adjustments are discussed further in Note 25.

In certain transactions, Citi incurs fees and presents these fees paid to third parties in operating expenses.

The following table presents *Principal transactions* revenue:

In millions of dollars	2022	2021	2020
Interest rate risks[1]	$ 3,940	$ 1,993	$ 4,668
Foreign exchange risks[2]	6,593	4,668	4,923
Equity risks[3]	1,858	2,197	1,431
Commodity and other risks[4]	1,801	1,123	1,140
Credit products and risks[5]	(33)	173	1,723
Total	$ 14,159	$ 10,154	$ 13,885

(1) Includes revenues from government securities and corporate debt, municipal securities, mortgage securities and other debt instruments. Also includes spot and forward trading of currencies and exchange-traded and over-the-counter (OTC) currency options, options on fixed income securities, interest rate swaps, currency swaps, swap options, caps and floors, financial futures, OTC options and forward contracts on fixed income securities.
(2) Includes revenues from foreign exchange spot, forward, option and swap contracts, as well as foreign currency translation (FX translation) gains and losses.
(3) Includes revenues from common, preferred and convertible preferred stock, convertible corporate debt, equity-linked notes and exchange-traded and OTC equity options and warrants.
(4) Primarily includes revenues from crude oil, refined oil products, natural gas and other commodities trades.
(5) Includes revenues from structured credit products.

7. INCENTIVE PLANS

Discretionary Annual Incentive Awards

Citigroup grants immediate cash bonus payments and various forms of immediate and deferred awards as part of its discretionary annual incentive award program involving a large segment of Citigroup's employees worldwide.

Discretionary annual incentive awards are generally awarded in the first quarter of the year based on the previous year's performance. Awards valued at less than U.S. $75,000 (or the local currency equivalent) are generally paid entirely in the form of an immediate cash bonus. Pursuant to Citigroup policy and/or regulatory requirements, certain employees are subject to mandatory deferrals of incentive pay and generally receive 15%–60% of their awards in the form of deferred stock or deferred cash stock units. Discretionary annual incentive awards to certain employees in the EU are subject to deferral requirements regardless of the total award value, with at least 50% of the immediate incentive delivered in the form of a stock payment award subject to a restriction on sale or transfer (generally, for 12 months).

For incentive awards granted in 2022, Citigroup changed the annual deferred compensation structure from granting deferred cash awards for certain regulated employees to deferred stock awards. Certain employees located in countries that have regulations or tax advantages for offering deferred cash or deferred cash stock units received those types of awards as a part of their annual incentive compensation rather than deferred stock.

Subject to certain exceptions (principally, for retirement-eligible employees), continuous employment within Citigroup is required to vest in deferred annual incentive awards. Post employment vesting by retirement-eligible employees and participants who meet other conditions is generally conditioned upon their compliance with certain restrictions during the remaining vesting period.

Generally, the deferred awards vest in equal annual installments over three- or four-year periods. Vested stock awards are delivered in shares of common stock. Deferred cash awards are payable in cash and, except as prohibited by applicable regulatory guidance, earn a fixed notional rate of interest that is paid only if and when the underlying principal award amount vests. Deferred cash stock unit awards are payable in cash at the vesting value of the underlying stock. Generally, in the EU, vested shares are subject to a restriction on sale or transfer after vesting, and vested deferred cash awards and deferred cash stock units are subject to hold back (generally, for 6 or 12 months based on the award type).

Stock awards, deferred cash stock units and deferred cash awards are subject to one or more cancellation and clawback provisions that apply in certain circumstances, including gross misconduct.

Outstanding (Unvested) Stock Awards

A summary of the status of unvested stock awards granted as discretionary annual incentive or sign-on and replacement awards is presented below:

Unvested stock awards	Shares	Weighted-average grant date fair value per share
Unvested at December 31, 2021	31,644,684	$ 66.22
Granted[1]	25,729,643	65.07
Canceled	(2,007,260)	65.94
Vested[2]	(13,458,860)	67.17
Unvested at December 31, 2022	**41,908,207**	**$ 65.23**

(1) The weighted-average fair value of the shares granted during 2021 and 2020 was $62.10 and $76.68, respectively.

(2) The weighted-average fair value of the shares vesting during 2022 was approximately $64.13 per share on the vesting date, compared to $67.17 on the grant date.

Total unrecognized compensation cost related to unvested stock awards was $862 million at December 31, 2022. The cost is expected to be recognized over a weighted-average period of 1.7 years.

Performance Share Units

Executive officers were awarded performance share units (PSUs) every February from 2019 to 2022, for performance in the year prior to the award date based on two performance metrics. For PSUs awarded in 2019 and 2020, those metrics were return on tangible common equity and earnings per share. For PSUs awards in 2021 and 2022, the metrics were return on tangible common equity and tangible book value per share. In each year, the metrics were equally weighted.

For all award years, if the total shareholder return is negative over the three-year performance period, executives may earn no more than 100% of the target PSUs, regardless of the extent to which Citigroup outperforms against performance goals and/or peer firms. The number of PSUs ultimately earned could vary from zero, if performance goals are not met, to as much as 150% of target, if performance goals are meaningfully exceeded. The reported financial metrics during the performance period are adjusted to reflect an equitable adjustment as required under the applicable award agreements for unusual and non-recurring items, including divestitures, as well as accounting rule and tax law changes.

For all award years, the value of each PSU is equal to the value of one share of Citi common stock. Dividend equivalents are accrued and paid on the number of earned PSUs after the end of the performance period.

PSUs are subject to variable accounting, pursuant to which the associated value of the award will fluctuate with changes in Citigroup's stock price and the attainment of the specified performance goals for each award. The award is settled solely in cash after the end of each performance period. The value of the award, subject to the performance goals and taking into account any mandatory equitable adjustments as per the terms of the award agreement, is estimated using a simulation model that incorporates multiple valuation assumptions, including the probability of achieving the specified performance goals of each award. The risk-free rate used in the model is based on the applicable U.S. Treasury yield curve. Other significant assumptions for the awards are as follows:

Valuation assumptions	2022	2021	2020
Expected volatility	37.01 %	40.88 %	22.26 %
Expected dividend yield	2.96	4.21	2.82

A summary of the performance share unit activity for 2022 is presented below:

Performance share units	Units	Weighted-average grant date fair value per unit
Outstanding, beginning of year	1,274,273	$ 77.67
Granted[1]	531,824	71.04
Canceled	(62,875)	72.83
Payments[2]	(461,087)	72.83
Outstanding, end of year	1,282,135	$ 76.90

(1) The weighted-average grant date fair value per unit awarded in 2021 and 2020 was $78.55 and $83.45, respectively.
(2) The value of the payments was approximately $32 million.

Transformation Program

In order to provide an incentive for select employees to effectively execute Citi's transformation program, in August 2021 the Personnel and Compensation (P&C) Committee of Citigroup's Board of Directors, the predecessor of the Compensation, Performance Management and Culture (CPC) Committee of Citigroup's Board of Directors, approved a program for them to earn additional compensation based on the achievement of Citi's transformation goals from August 2021 through December 2024 and satisfaction of other conditions. Performance under the program is divided into three consecutive periods, ending on December 31, 2022, 2023 and 2024. The awards are subject to variable accounting, pursuant to which the associated value of the award will fluctuate with the attainment of the performance conditions for each tranche and changes to Citigroup's stock price for the third tranche. Payment for each period will be in cash, in a lump sum, with the third payment indexed to changes in the value of Citi's common stock from the service inception date through the payment date. Earnings generally will be based on collective performance with respect to Citi's transformation goals and will be evaluated and approved by the CPC Committee on an annual basis.

Payments in the event of any category of employment termination or change in job title or employment status are subject to Citi's discretion. Cancellation and clawback are provided for in the event of misconduct and certain other circumstances. The program applies to senior leaders, other than the CEO, critical to helping deliver a successful transformation with the value varying based on individual compensation levels.

Stock Option Program

All outstanding options were fully vested at December 31, 2020 and exercised during 2021, with none outstanding at December 31, 2022 and 2021.

Other Variable Incentive Compensation

Citigroup has various incentive plans globally that are used to motivate and reward performance primarily in the areas of sales, operational excellence and customer satisfaction. Participation in these plans is generally limited to employees who are not eligible for discretionary annual incentive awards. Other forms of variable compensation include commissions paid to financial advisors and mortgage loan officers.

Summary

Except for awards subject to variable accounting, the total expense recognized for stock awards represents the grant date fair value of such awards, which is generally recognized as a charge to income ratably over the vesting period, other than for awards to retirement-eligible employees and immediately vested awards. Whenever awards are granted or are expected to be granted to retirement-eligible employees, the charge to income is accelerated based on when the applicable conditions for retirement eligibility were or will be met. If the employee is retirement eligible on the grant date, or the award is vested at the grant date, Citi recognizes the expense each year equal to the grant date fair value of the awards that it estimates will be granted in the following year.

Recipients of Citigroup stock awards generally do not have any stockholder rights until shares are delivered upon vesting or exercise. Recipients of deferred stock awards and deferred cash stock unit awards, however, may, except as prohibited by applicable regulatory guidance, be entitled to receive or accrue dividend-equivalent payments during the vesting period. Recipients of stock payment awards and other stock awards subject to a sale-restriction period are generally entitled to vote the shares in their award and receive dividends on such shares during the sale-restriction period. Once a stock award vests, the shares delivered to the participant are freely transferable, unless they are subject to a restriction on sale or transfer for a specified period.

All equity awards granted since April 19, 2005 have been made pursuant to stockholder-approved stock incentive plans that are administered by the CPC Committee (or its predecessor), which is composed entirely of independent non-employee directors.

On December 31, 2022, approximately 48.0 million shares of Citigroup common stock were authorized and available for grant under Citigroup's 2019 Stock Incentive Plan, the only plan from which equity awards are currently granted.

The 2019 Stock Incentive Plan and predecessor plans permit the use of treasury stock or newly issued shares in connection with awards granted under the plans. Treasury shares were used to settle vestings from 2018 to 2021, and for the first quarter of 2022, except where local laws favor newly issued shares. The use of treasury stock or newly issued shares to settle stock awards does not affect the compensation expense recorded in the Consolidated Statement of Income for equity awards.

Incentive Compensation Cost

The following table shows components of compensation expense, relating to certain of the incentive compensation programs described above:

In millions of dollars	**2022**	2021	2020
Charges for estimated awards to retirement-eligible employees	$ **742**	$ 807	$ 748
Amortization of deferred cash awards, deferred cash stock units and performance stock units	**463**	384	201
Immediately vested stock award expense[1]	**101**	99	95
Amortization of restricted and deferred stock awards[2]	**533**	395	420
Other variable incentive compensation	**304**	435	627
Total	$ **2,143**	$ 2,120	$ 2,091

(1) Represents expense for immediately vested stock awards that generally were stock payments in lieu of cash compensation. The expense is generally accrued as cash incentive compensation in the year prior to grant.

(2) All periods include amortization expense for all unvested awards to non-retirement-eligible employees.

8. RETIREMENT BENEFITS

Pension and Postretirement Plans

The Company has several non-contributory defined benefit pension plans covering certain U.S. employees and has various defined benefit pension and termination indemnity plans covering employees outside the U.S.

The U.S. qualified defined benefit plan was frozen effective January 1, 2008 for most employees. Accordingly, no additional compensation-based contributions have been credited to the cash balance portion of the plan for existing plan participants after 2007. However, certain employees covered under the prior final pay plan formula continue to accrue benefits. The Company also offers postretirement health care and life insurance benefits to certain eligible U.S. retired employees, as well as to certain eligible employees outside the U.S.

The Company also sponsors a number of non-contributory, nonqualified pension plans. These plans, which are unfunded, provide supplemental defined pension benefits to certain U.S. employees. With the exception of certain employees covered under the prior final pay plan formula, the benefits under these plans were frozen in prior years.

The plan obligations, plan assets and periodic plan expense for the Company's most significant pension and postretirement benefit plans (Significant Plans) are measured and disclosed quarterly, instead of annually. The Significant Plans captured approximately 90% of the Company's global pension and postretirement plan obligations as of December 31, 2022. All other plans (All Other Plans) are measured annually with a December 31 measurement date.

Net (Benefit) Expense

The following table summarizes the components of net (benefit) expense recognized in the Consolidated Statement of Income for the Company's pension and postretirement plans for Significant Plans and All Other Plans. Benefits earned during the year are reported in *Compensation and benefits expenses* and all other components of the net annual benefit cost are reported in *Other operating expenses* in the Consolidated Statement of Income:

	Pension plans						Postretirement benefit plans					
	U.S. plans			Non-U.S. plans			U.S. plans			Non-U.S. plans		
In millions of dollars	**2022**	2021	2020	**2022**	2021	2020	**2022**	2021	2020	**2022**	2021	2020
Service cost	$ —	$ —	$ —	$ **116**	$ 149	$ 147	$ —	$ —	$ —	$ **2**	$ 6	$ 7
Interest cost on benefit obligation	**442**	351	378	**329**	268	246	**16**	13	17	**90**	96	93
Expected return on assets	**(612)**	(683)	(824)	**(263)**	(253)	(245)	**(11)**	(13)	(17)	**(69)**	(84)	(77)
Amortization of unrecognized:												
Prior service cost (benefit)	**2**	2	2	**(7)**	(6)	5	**(9)**	(9)	(2)	**(8)**	(9)	(9)
Net actuarial loss (gain)	**162**	228	233	**58**	62	70	**(9)**	(3)	—	**6**	13	20
Curtailment loss (gain)[1]	—	—	—	**(22)**	1	(8)	—	—	—	—	—	—
Settlement loss (gain)[1]	—	—	—	**(15)**	10	(1)	—	—	—	—	—	—
Total net (benefit) expense	$ **(6)**	$ (102)	$ (211)	$ **196**	$ 231	$ 214	$ **(13)**	$ (12)	$ (2)	$ **21**	$ 22	$ 34

(1) Curtailment and settlement relate to divestiture activities. Total net expense for non-U.S. plans includes a $36 million net benefit related to the wind-down of Citi's consumer banking business in Korea.

Contributions

The Company's funding practice for U.S. and non-U.S. pension and postretirement plans is generally to fund to minimum funding requirements in accordance with applicable local laws and regulations. The Company may increase its contributions above the minimum required contribution, if appropriate. In addition, management has the ability to change its funding practices. For the U.S. pension plans, there were no required minimum cash contributions for 2022 or 2021.

The following table summarizes the Company's actual contributions for the years ended December 31, 2022 and 2021, as well as expected Company contributions for 2023. Expected contributions are subject to change, since contribution decisions are affected by various factors, such as market performance, tax considerations and regulatory requirements.

	Pension plans[1]						Postretirement benefit plans[1]					
	U.S. plans[2]			Non-U.S. plans			U.S. plans			Non-U.S. plans		
In millions of dollars	**2023**	2022	2021	**2023**	2022	2021	**2023**	2022	2021	**2023**	2022	2021
Contributions made by the Company	$ —	$ —	$ —	$ **71**	$ 158	$ 104	$ —	$ —	$ —	$ **4**	$ 4	$ 3
Benefits paid directly by (reimbursements to) the Company[3]	**57**	55	56	**39**	336	51	**5**	14	22	**5**	5	5

(1) Amounts reported for 2023 are expected amounts.
(2) The U.S. pension plans include benefits paid directly by the Company for the nonqualified pension plans.
(3) 2022 benefit payments have increased due to the wind-down of Citi's consumer banking business in Korea. See Note 2 for additional information.

Funded Status and *Accumulated Other Comprehensive Income (AOCI)*

The following table summarizes the funded status and amounts recognized on the Consolidated Balance Sheet for the Company's pension and postretirement plans:

	Pension plans				Postretirement benefit plans			
	U.S. plans		Non-U.S. plans		U.S. plans		Non-U.S. plans	
In millions of dollars	**2022**	2021	**2022**	2021	**2022**	2021	**2022**	2021
Change in benefit obligation								
Benefit obligation at beginning of year	**$ 12,766**	$ 13,815	**$ 8,001**	$ 8,629	**$ 501**	$ 559	**$ 1,169**	$ 1,390
Service cost	**—**	—	**116**	149	**—**	—	**2**	6
Interest cost on benefit obligation	**442**	351	**329**	268	**16**	13	**90**	96
Plan amendments	**—**	—	**—**	6	**—**	—	**—**	—
Actuarial (gain)[2]	**(2,522)**	(447)	**(1,168)**	(344)	**(95)**	(28)	**(100)**	(110)
Benefits paid, net of participants' contributions	**(945)**	(953)	**(397)**	(345)	**(47)**	(43)	**(72)**	(78)
Divestitures	**—**	—	**(22)**	—	**—**	—	**—**	—
Settlement[4]	**—**	—	**(364)**	(124)	**—**	—	**—**	—
Curtailment[4]	**—**	—	**(35)**	(30)	**—**	—	**—**	—
Foreign exchange impact and other	**—**	—	**(85)**	(208)	**—**	—	**(76)**	(135)
Benefit obligation at year end	**$ 9,741**	$ 12,766	**$ 6,375**	$ 8,001	**$ 375**	$ 501	**$ 1,013**	$ 1,169
Change in plan assets								
Plan assets at fair value at beginning of year	**$ 12,977**	$ 13,309	**$ 7,614**	$ 7,831	**$ 319**	$ 331	**$ 1,043**	$ 1,146
Actual return on assets[2]	**(1,942)**	565	**(1,212)**	217	**(33)**	9	**(75)**	97
Company contributions, net of reimbursements	**55**	56	**495**	155	**14**	22	**9**	8
Benefits paid, net of participants' contributions	**(945)**	(953)	**(397)**	(345)	**(47)**	(43)	**(72)**	(78)
Divestitures	**—**	—	**(11)**	—	**—**	—	**—**	—
Settlement[4]	**—**	—	**(364)**	(124)	**—**	—	**—**	—
Foreign exchange impact and other	**—**	—	**(39)**	(120)	**—**	—	**(50)**	(130)
Plan assets at fair value at year end	**$ 10,145**	$ 12,977	**$ 6,086**	$ 7,614	**$ 253**	$ 319	**$ 855**	$ 1,043
Funded status of the plans								
Qualified plans[5]	**$ 949**	$ 894	**$ (289)**	$ (387)	**$ (122)**	$ (182)	**$ (158)**	$ (126)
Nonqualified plans[3]	**(545)**	(683)	**—**	—	**—**	—	**—**	—
Funded status of the plans at year end	**$ 404**	$ 211	**$ (289)**	$ (387)	**$ (122)**	$ (182)	**$ (158)**	$ (126)
Net amount recognized at year end								
Qualified plans								
Benefit asset	**$ 949**	$ 894	**$ 799**	$ 963	**$ —**	$ —	**$ 28**	$ 165
Benefit liability	**—**	—	**(1,088)**	(1,350)	**(122)**	(182)	**(186)**	(291)
Qualified plans	**$ 949**	$ 894	**$ (289)**	$ (387)	**$ (122)**	$ (182)	**$ (158)**	$ (126)
Nonqualified plans	**(545)**	(683)	**—**	—	**—**	—	**—**	—
Net amount recognized on the balance sheet	**$ 404**	$ 211	**$ (289)**	$ (387)	**$ (122)**	$ (182)	**$ (158)**	$ (126)
Amounts recognized in *AOCI* at year end[1]								
Net transition obligation	**$ —**	$ —	**$ —**	$ —	**$ —**	$ —	**$ —**	$ —
Prior service (cost) benefit	**(6)**	(8)	**7**	5	**82**	92	**36**	47
Net actuarial (loss) gain	**(6,445)**	(6,575)	**(1,671)**	(1,400)	**120**	77	**(206)**	(182)
Net amount recognized in equity (pretax)	**$ (6,451)**	$ (6,583)	**$ (1,664)**	$ (1,395)	**$ 202**	$ 169	**$ (170)**	$ (135)
Accumulated benefit obligation at year end	**$ 9,740**	$ 12,765	**$ 6,051**	$ 7,559	**$ 375**	$ 501	**$ 1,013**	$ 1,169

(1) The framework for the Company's pension oversight process includes monitoring of potential settlement charges for all plans. Settlement accounting is triggered when either the sum of all settlements (including lump sum payments) for the year is greater than service plus interest costs or if more than 10% of the plan's projected benefit obligation will be settled. Because some of Citi's Significant Plans are frozen and have no material service cost, settlement accounting may apply in the future.

(2) Actuarial gain was primarily due to the increase in global discount rates partially offset by lower than expected asset returns.

(3) The nonqualified plans of the Company are unfunded.

(4) Curtailment and settlement relate to divestiture activities.

(5) The U.S. qualified plan was fully funded as of January 1, 2022 and no minimum funding was required for 2022. The plan is also expected to be fully funded as of January 1, 2023 with no expected minimum funding requirement for 2023.

The following table shows the change in *AOCI* related to the Company's pension, postretirement and post employment plans:

In millions of dollars	2022	2021	2020
Beginning of year balance, net of tax[1][2]	$ (5,852)	$ (6,864)	$ (6,809)
Actuarial assumptions changes and plan experience	3,923	963	(1,464)
Net asset gain (loss) due to difference between actual and expected returns	(4,225)	(148)	1,076
Net amortization	198	280	318
Prior service credit (cost)	—	(7)	108
Curtailment/settlement gain (loss)[3]	(37)	11	(8)
Foreign exchange impact and other	172	153	(108)
Change in deferred taxes, net	66	(240)	23
Change, net of tax	$ 97	$ 1,012	$ (55)
End of year balance, net of tax[1][2]	$ (5,755)	$ (5,852)	$ (6,864)

(1) See Note 20 for further discussion of net *AOCI* balance.
(2) Includes net-of-tax amounts for certain profit-sharing plans outside the U.S.
(3) Curtailment and settlement relate to divestiture activities.

At December 31, 2022 and 2021, the aggregate projected benefit obligation (PBO), the aggregate accumulated benefit obligation (ABO) and the aggregate fair value of plan assets are presented for all defined benefit pension plans with a PBO in excess of plan assets and for all defined benefit pension plans with an ABO in excess of plan assets as follows:

	PBO exceeds fair value of plan assets				ABO exceeds fair value of plan assets			
	U.S. plans[1]		Non-U.S. plans		U.S. plans[1]		Non-U.S. plans	
In millions of dollars	2022	2021	2022	2021	2022	2021	2022	2021
Projected benefit obligation	$ 545	$ 683	$ 3,463	$ 3,966	$ 545	$ 683	$ 3,315	$ 3,809
Accumulated benefit obligation	545	683	3,179	3,574	545	682	3,088	3,477
Fair value of plan assets	—	—	2,374	2,616	—	—	2,252	2,486

(1) As of December 31, 2022 and 2021, only the nonqualified plans' PBO and ABO exceeded plan assets.

Plan Assumptions

The Company utilizes a number of assumptions to determine plan obligations and expenses. Changes in one or a combination of these assumptions will have an impact on the Company's pension and postretirement PBO, funded status and (benefit) expense. Changes in the plans' funded status resulting from changes in the PBO and fair value of plan assets will have a corresponding impact on *Accumulated other comprehensive income (loss)*.

The actuarial assumptions at the respective years ended December 31 in the table below are used to measure the year-end PBO and the net periodic (benefit) expense for the subsequent year (period). Since Citi's Significant Plans are measured on a quarterly basis, the year-end rates for those plans are used to calculate the net periodic (benefit) expense for the subsequent year's first quarter.

As a result of the quarterly measurement process, the net periodic (benefit) expense for the Significant Plans is calculated at each respective quarter end based on the preceding quarter-end rates (as shown below for the U.S. and non-U.S. pension and postretirement plans). The actuarial assumptions for All Other Plans are measured annually.

Certain assumptions used in determining pension and postretirement benefit obligations and net benefit expense for the Company's plans are shown in the following table:

At year end	**2022**	2021
Discount rate		
U.S. plans		
Qualified pension	**5.50%**	2.80%
Nonqualified pension	**5.55**	2.80
Postretirement	**5.60**	2.75
Non-U.S. pension plans		
Range[1]	**1.75 to 25.20**	-0.10 to 11.95
Weighted average	**6.66**	3.96
Non-U.S. postretirement plans		
Range	**3.25 to 10.60**	1.05 to 10.00
Weighted average	**9.80**	8.28
Future compensation increase rate[2]		
Non-U.S. pension plans		
Range	**1.30 to 23.11**	1.30 to 11.25
Weighted average	**3.76**	3.10
Expected return on assets		
U.S. plans		
Qualified pension	**5.70**	5.00
Postretirement[3]	**5.70/3.00**	5.00/1.50
Non-U.S. pension plans		
Range	**1.00 to 11.50**	0.00 to 11.50
Weighted average	**6.05**	3.69
Non-U.S. postretirement plans		
Range	**8.70 to 9.10**	6.00 to 8.00
Weighted average	**8.70**	7.99

(1) In 2021, due to historically low global interest rates, there were negative discount rates for plans with relatively short duration in certain major markets, such as the Eurozone and Switzerland.
(2) Not material for U.S. plans.
(3) For the years ended 2022 and 2021, the expected return on assets for the VEBA Trust was 3.00% and 1.50%, respectively.

During the year	**2022**	2021	2020
Discount rate			
U.S. plans			
Qualified pension	**2.80%/3.80%/ 4.80%/5.65%**	2.45%/3.10%/ 2.75%/2.80%	3.25%/3.20%/ 2.60%/2.55%
Nonqualified pension	**2.80/3.85/ 4.80/5.60**	2.35/3.00/ 2.70/2.75	3.25/3.25/ 2.55/2.50
Postretirement	**2.75/3.85/ 4.75/5.65**	2.20/2.85/ 2.60/2.65	3.15/3.20/ 2.45/2.35
Non-U.S. pension plans[1]			
Range[2]	**-0.10 to 11.95**	-0.25 to 11.15	-0.10 to 11.30
Weighted average	**3.96**	3.14	3.65
Non-U.S. postretirement plans[1]			
Range	**1.05 to 11.25**	0.80 to 9.80	0.90 to 9.75
Weighted average	**8.28**	7.42	7.76
Future compensation increase rate[3]			
Non-U.S. pension plans[1]			
Range	**1.30 to 11.25**	1.20 to 11.25	1.50 to 11.50
Weighted average	**3.10**	3.10	3.17
Expected return on assets			
U.S. plans			
Qualified pension[4]	**5.00**	5.80/5.60/ 5.60/5.00	6.70
Postretirement[4]	**5.00/1.50**	5.80/5.60/ 5.00/1.50	6.70/3.00
Non-U.S. pension plans[1]			
Range	**0.00 to 11.50**	0.00 to 11.50	0.00 to 11.50
Weighted average	**3.69**	3.39	3.95
Non-U.S. postretirement plans[1]			
Range	**6.00 to 8.00**	5.95 to 8.00	6.20 to 8.00
Weighted average	**7.99**	7.99	7.99

(1) Reflects rates utilized to determine the quarterly expense for Significant non-U.S. pension and postretirement plans.
(2) In 2021, due to historically low global interest rates, there were negative discount rates for plans with relatively short duration in certain major markets, such as the Eurozone and Switzerland.
(3) Not material for U.S. plans.
(4) The expected return on assets for the U.S. pension and postretirement plans was adjusted from 5.00% to 5.70% effective January 1, 2023 to reflect a significant change in economic market conditions. The expected return on assets for the U.S. pension and postretirement plans changed from 6.70% to 5.80% effective as of January 1, 2021, reduced to 5.60% effective April 1, 2021 and further reduced to 5.00% effective October 1, 2021.

Discount Rate

The discount rates for the U.S. pension and postretirement plans were selected by reference to a Citigroup-specific analysis using each plan's specific cash flows and a hypothetical bond portfolio of U.S. high-quality corporate bonds that match each plan's projected cash flows. The discount rates for the non-U.S. pension and postretirement plans are selected by reference to each plan's specific cash flows and a market-based yield curve developed from the available local high-quality corporate bonds. However, where developed corporate bond markets do not exist, the discount rates are selected by reference to local government bonds with an estimated premium added to reflect the additional risk for corporate bonds in certain countries. Where available, the resulting plan yields by jurisdiction are compared with published, high-quality corporate bond indices for reasonableness.

Expected Return on Assets

The Company determines its assumptions for the expected return on assets for its U.S. pension and postretirement plans using a "building block" approach, which focuses on ranges of anticipated rates of return for each asset class. A weighted average range of nominal rates is then determined based on target allocations to each asset class. Market performance over a number of earlier years is evaluated covering a wide range of economic conditions to determine whether there are sound reasons for projecting any past trends.

The Company considers the expected return on assets to be a long-term assessment of return expectations and does not anticipate changing this assumption unless there are significant changes in investment strategy or economic conditions. This contrasts with the selection of the discount rate and certain other assumptions, which are reconsidered annually (or quarterly for the Significant Plans) in accordance with GAAP.

The expected return on assets reflects the expected annual appreciation of the plan assets and reduces the Company's annual pension expense. The expected return on assets is deducted from the sum of service cost, interest cost and other components of pension expense to arrive at the net pension (benefit) expense.

The following table shows the expected return on assets used in determining the Company's pension expense compared to the actual return on assets during 2022, 2021 and 2020 for the U.S. pension and postretirement plans:

U.S. plans (During the year)	**2022**	2021	2020
Expected return on assets			
U.S. pension and postretirement trust	**5.00%**	5.80%/5.60%/ 5.60%/5.00%	6.70%
VEBA Trust[2]	**1.50**	1.50	3.00
Actual return on assets[1]			
U.S. pension and postretirement trust	**(15.52)**	5.14	12.84
VEBA Trust	**1.40**	1.52	2.11

(1) Actual return on assets is presented net of fees.

(2) The expected return on assets for the VEBA Trust was adjusted from 1.50% to 3.00% effective January 1, 2023 to reflect significant change in economic condition.

Sensitivities of Certain Key Assumptions

The following tables summarize the effect on pension expense:

	Discount rate		
	One-percentage-point increase		
In millions of dollars	**2022**	2021	2020
U.S. plans	$ **27**	$ 35	$ 34
Non-U.S. plans	**(5)**	(4)	(16)

	One-percentage-point decrease		
In millions of dollars	**2022**	2021	2020
U.S. plans	$ **(34)**	$ (49)	$ (52)
Non-U.S. plans	**15**	25	25

The U.S. Qualified Pension Plan was frozen in 2008, and as a result, most of the prospective service costs have been eliminated and the gain/loss amortization period was changed to the life expectancy for inactive participants. As a result, pension expense for the U.S. Qualified Pension Plan is driven more by interest costs than service costs, and an increase in the discount rate would increase pension expense, while a decrease in discount rate would decrease pension expense.

For Non-U.S. Pension Plans that are not frozen (in countries such as Mexico, the U.K. and South Korea), there is more service cost. The pension expense for the Non-U.S. Plans is driven by both service cost and interest cost. An increase in the discount rate generally decreases pension expense due to the greater impact on service cost compared to interest cost.

The following tables summarize the effect on pension expense:

	Expected return on assets		
	One-percentage-point increase		
In millions of dollars	**2022**	2021	2020
U.S. plans	$ **(123)**	$ (124)	$ (123)
Non-U.S. plans	**(60)**	(70)	(66)

	One-percentage-point decrease		
In millions of dollars	**2022**	2021	2020
U.S. plans	$ **123**	$ 124	$ 123
Non-U.S. plans	**60**	70	66

Health Care Cost Trend Rate

Assumed health care cost trend rates were as follows:

	2022	2021
Health care cost increase rate for U.S. plans		
Following year	**7.00%**	6.25%
Ultimate rate to which cost increase is assumed to decline	**5.00**	5.00
Year in which the ultimate rate is reached	**2031**	2027
Health care cost increase rate for non-U.S. plans (weighted average)		
Following year	**7.05%**	6.92%
Ultimate rate to which cost increase is assumed to decline	**7.05**	6.92
Year in which the ultimate rate is reached	**2023**	2022

Interest Crediting Rate

The Company has cash balance plans and other plans with promised interest crediting rates. For these plans, the interest crediting rates are set in line with plan rules or country legislation and do not change with market conditions.

	Weighted average interest crediting rate		
At year end	**2022**	2021	2020
U.S. plans	**4.50%**	1.80%	1.45%
Non-U.S. plans	**1.73**	1.61	1.60

Plan Assets

Citigroup's pension and postretirement plans' asset allocations for the U.S. plans and the target allocations by asset category based on asset fair values are as follows:

	Target asset allocation	U.S. pension assets at December 31,		U.S. postretirement assets at December 31,	
Asset category[1]	2023	**2022**	2021	**2022**	2021
Equity securities[2]	0–22%	**7 %**	7 %	**7 %**	7 %
Debt securities[3]	55–114	**71**	72	**71**	72
Real estate	0–4	**3**	2	**3**	2
Private equity	0–5	**7**	6	**7**	6
Other investments	0–23	**12**	13	**12**	13
Total		**100 %**	100 %	**100 %**	100 %

(1) Target asset allocations are set by investment strategy, whereas pension and postretirement assets as of December 31, 2022 and 2021 are based on the underlying investment product. For example, the private equity investment strategy may include underlying investments in real estate within the target asset allocation; however, within pension and postretirement assets, the underlying investment in real estate is reflected in the real estate category and not private equity.

(2) Equity securities in the U.S. pension and postretirement plans do not include any Citigroup common stock at the end of 2022 and 2021.

(3) The VEBA Trust for postretirement benefits is primarily invested in cash equivalents and debt securities in 2022 and 2021 and is not reflected in the table above.

Third-party investment managers and advisors provide their services to Citigroup's U.S. pension and postretirement plans. Assets are rebalanced as the Company's Pension Plan Investment Committee deems appropriate. Citigroup's investment strategy, with respect to its assets, is to maintain a globally diversified investment portfolio across several asset classes that, when combined with Citigroup's contributions to the plans, will maintain the plans' ability to meet all required benefit obligations.

Citigroup's pension and postretirement plans' weighted-average asset allocations for the non-U.S. plans and the actual ranges, and the weighted-average target allocations by asset category based on asset fair values, are as follows:

	Non-U.S. pension plans				
	Target asset allocation	Actual range at December 31,		Weighted-average at December 31,	
Asset category[1]	2023	2022	2021	2022	2021
Equity securities	0–100%	0–63%	0–100%	19 %	16 %
Debt securities	0–100	0–100	0–100	73	76
Real estate	0–15	0–15	0–14	1	1
Other investments	0–100	0–100	0–100	7	7
Total				100 %	100 %

	Non-U.S. postretirement plans				
	Target asset allocation	Actual range at December 31,		Weighted-average at December 31,	
Asset category[1]	2023	2022	2021	2022	2021
Equity securities	0–46%	0–48%	0–42%	47 %	41 %
Debt securities	50–100	45–100	53–100	49	53
Other investments	0–4	0–7	0–6	4	6
Total				100 %	100 %

(1) Similar to the U.S. plans, asset allocations for certain non-U.S. plans are set by investment strategy, not by investment product.

Fair Value Disclosure

For information on fair value measurements, including descriptions of Levels 1, 2 and 3 of the fair value hierarchy and the valuation methodology utilized by the Company, see Notes 1 and 25. Investments measured using the NAV per share practical expedient are excluded from Level 1, Level 2 and Level 3 in the tables below.

Certain investments may transfer between the fair value hierarchy classifications during the year due to changes in valuation methodology and pricing sources.

Plan assets by detailed asset categories and the fair value hierarchy are as follows:

	U.S. pension and postretirement benefit plans[1]			
In millions of dollars	Fair value measurement at December 31, 2022			
Asset categories	**Level 1**	**Level 2**	**Level 3**	**Total**
U.S. equities	$ 233	$ —	$ —	$ 233
Non-U.S. equities	346	—	—	346
Mutual funds and other registered investment companies	243	—	—	243
Commingled funds	—	818	—	818
Debt securities	929	4,638		5,567
Annuity contracts	—	—	3	3
Derivatives	2	34	—	36
Other investments	—	—	4	4
Total investments	$ 1,753	$ 5,490	$ 7	$ 7,250
Cash and short-term investments	$ 39	$ 563	$ —	$ 602
Other investment liabilities	(10)	(45)	—	(55)
Net investments at fair value	$ 1,782	$ 6,008	$ 7	$ 7,797
Other investment receivables redeemed at NAV				$ 21
Securities valued at NAV				2,580
Total net assets				$ 10,398

(1) The investments of the U.S. pension and postretirement plans are commingled in one trust. At December 31, 2022, the allocable interests of the U.S. pension and postretirement plans were 98.0% and 2.0%, respectively. The investments of the VEBA Trust for postretirement benefits are reflected in the above table.

	U.S. pension and postretirement benefit plans[1]			
In millions of dollars	Fair value measurement at December 31, 2021			
Asset categories	Level 1	Level 2	Level 3	Total
U.S. equities	$ 358	$ —	$ —	$ 358
Non-U.S. equities	460	—	—	460
Mutual funds and other registered investment companies	297	—	—	297
Commingled funds	—	1,143	—	1,143
Debt securities	1,657	5,770	—	7,427
Annuity contracts	—	—	4	4
Derivatives	2	17	—	19
Other investments	13	—	25	38
Total investments	$ 2,787	$ 6,930	$ 29	$ 9,746
Cash and short-term investments	$ 25	$ 627	$ —	$ 652
Other investment liabilities	(7)	(17)	—	(24)
Net investments at fair value	$ 2,805	$ 7,540	$ 29	$ 10,374
Other investment liabilities redeemed at NAV				$ (29)
Securities valued at NAV				2,951
Total net assets				$ 13,296

(1) The investments of the U.S. pension and postretirement plans are commingled in one trust. At December 31, 2021, the allocable interests of the U.S. pension and postretirement plans were 98.0% and 2.0%, respectively. The investments of the VEBA Trust for postretirement benefits are reflected in the above table.

In millions of dollars	Non-U.S. pension and postretirement benefit plans Fair value measurement at December 31, 2022			
Asset categories	**Level 1**	**Level 2**	**Level 3**	**Total**
U.S. equities	$ 121	$ 10	$ —	$ 131
Non-U.S. equities	718	19	—	737
Mutual funds and other registered investment companies	2,416	296	—	2,712
Commingled funds	13	—	—	13
Debt securities	2,959	980	—	3,939
Real estate	—	2	2	4
Annuity contracts	—	—	2	2
Derivatives	—	1,490	—	1,490
Other investments	—	—	258	258
Total investments	$ 6,227	$ 2,797	$ 262	$ 9,286
Cash and short-term investments	$ 69	$ 6	$ —	$ 75
Other investment liabilities	—	(2,436)	—	(2,436)
Net investments at fair value	$ 6,296	$ 367	$ 262	$ 6,925
Securities valued at NAV				$ 16
Total net assets				$ 6,941

In millions of dollars	Non-U.S. pension and postretirement benefit plans Fair value measurement at December 31, 2021			
Asset categories	Level 1	Level 2	Level 3	Total
U.S. equities	$ 127	$ 19	$ —	$ 146
Non-U.S. equities	713	92	—	805
Mutual funds and other registered investment companies	2,888	66	—	2,954
Commingled funds	21	—	—	21
Debt securities	4,263	1,341	—	5,604
Real estate	—	3	2	5
Annuity contracts	—	—	2	2
Derivatives	—	239	—	239
Other investments	—	—	318	318
Total investments	$ 8,012	$ 1,760	$ 322	$ 10,094
Cash and short-term investments	$ 117	$ 5	$ —	$ 122
Other investment liabilities	—	(1,578)	—	(1,578)
Net investments at fair value	$ 8,129	$ 187	$ 322	$ 8,638
Securities valued at NAV				$ 19
Total net assets				$ 8,657

Level 3 Rollforward

The reconciliations of the beginning and ending balances during the year for Level 3 assets are as follows:

In millions of dollars	**U.S. pension and postretirement benefit plans**					
Asset categories	**Beginning Level 3 fair value at Dec. 31, 2021**	**Realized (losses)**	**Unrealized gains**	**Purchases, sales and issuances**	**Transfers in and/ or out of Level 3**	**Ending Level 3 fair value at Dec. 31, 2022**
Annuity contracts	$ 4	$ —	$ —	$ (1)	$ —	$ 3
Other investments	25	(3)	2	(20)	—	4
Total investments	$ 29	$ (3)	$ 2	$ (21)	$ —	$ 7

In millions of dollars	U.S. pension and postretirement benefit plans					
Asset categories	Beginning Level 3 fair value at Dec. 31, 2020	Realized (losses)	Unrealized gains	Purchases, sales and issuances	Transfers in and/ or out of Level 3	Ending Level 3 fair value at Dec. 31, 2021
Annuity contracts	$ 1	$ —	$ —	$ 3	$ —	$ 4
Other investments	57	(6)	2	(28)	—	25
Total investments	$ 58	$ (6)	$ 2	$ (25)	$ —	$ 29

In millions of dollars	**Non-U.S. pension and postretirement benefit plans**				
Asset categories	**Beginning Level 3 fair value at Dec. 31, 2021**	**Unrealized gains**	**Purchases, sales and issuances**	**Transfers in and/ or out of Level 3**	**Ending Level 3 fair value at Dec. 31, 2022**
Real estate	$ 2	$ —	$ —	$ —	$ 2
Annuity contracts	2	—	—	—	2
Other investments	318	—	(60)	—	258
Total investments	$ 322	$ —	$ (60)	$ —	$ 262

In millions of dollars	Non-U.S. pension and postretirement benefit plans				
Asset categories	Beginning Level 3 fair value at Dec. 31, 2020	Unrealized gains	Purchases, sales and issuances	Transfers in and/ or out of Level 3	Ending Level 3 fair value at Dec. 31, 2021
Real estate	$ 2	$ —	$ —	$ —	$ 2
Annuity contracts	5	—	(3)	—	2
Other investments	312	4	2	—	318
Total investments	$ 319	$ 4	$ (1)	$ —	$ 322

Investment Strategy
The Company's global pension and postretirement funds' investment strategy is to invest in a prudent manner for the exclusive purpose of providing benefits to participants. The investment strategies are targeted to produce a total return that, when combined with the Company's contributions to the funds, will maintain the funds' ability to meet all required benefit obligations. Risk is controlled through diversification of asset types and investments in domestic and international equities, fixed income securities and cash and short-term investments. The target asset allocation in most locations outside the U.S. is primarily in equity and debt securities. These allocations may vary by geographic region and country depending on the nature of applicable obligations and various other regional considerations. The wide variation in the actual range of plan asset allocations for the funded non-U.S. plans is a result of differing local statutory requirements and economic conditions. For example, in certain countries local law requires that all pension plan assets must be invested in fixed income investments, government funds or local-country securities.

Significant Concentrations of Risk in Plan Assets
The assets of the Company's pension plans are diversified to limit the impact of any individual investment. The U.S. qualified pension plan is diversified across multiple asset classes, with publicly traded fixed income, publicly traded equity, hedge funds and real estate representing the most significant asset allocations. Investments in these four asset classes are further diversified across funds, managers, strategies, vintages, sectors and geographies, depending on the specific characteristics of each asset class. The pension assets for the Company's non-U.S. Significant Plans are primarily invested in publicly traded fixed income and publicly traded equity securities.

Oversight and Risk Management Practices
The framework for the Company's pension oversight process includes monitoring of retirement plans by plan fiduciaries and/or management at the global, regional or country level, as appropriate. Independent Risk Management contributes to the risk oversight and monitoring for the Company's U.S. Qualified Pension Plan and non-U.S. Significant Pension Plans. Although the specific components of the oversight process are tailored to the requirements of each region, country and plan, the following elements are common to the Company's monitoring and risk management process:

- periodic asset/liability management studies and strategic asset allocation reviews;
- periodic monitoring of funding levels and funding ratios;
- periodic monitoring of compliance with asset allocation guidelines;
- periodic monitoring of asset class and/or investment manager performance against benchmarks; and
- periodic risk capital analysis and stress testing.

Estimated Future Benefit Payments
The Company expects to pay the following estimated benefit payments in future years:

	Pension plans		Postretirement benefit plans	
In millions of dollars	U.S. plans	Non-U.S. plans	U.S. plans	Non-U.S. plans
2023	$ 964	$ 536	$ 55	$ 72
2024	964	518	46	76
2025	969	489	43	79
2026	942	499	40	83
2027	921	508	38	87
2028–2032	4,038	2,623	150	494

Post Employment Plans

The Company sponsors U.S. post employment plans that provide income continuation and health and welfare benefits to certain eligible U.S. employees on long-term disability. The following table summarizes the funded status and amounts recognized on the Company's Consolidated Balance Sheet:

In millions of dollars	2022	2021
Funded status of the plan at year end	$ (48)	$ (41)
Net amount recognized in *AOCI* (pretax)	$ (16)	$ (15)

The following table summarizes the net expense recognized in the Consolidated Statement of Income for the Company's U.S. post employment plans:

In millions of dollars	2022	2021	2020
Net expense	$ 11	$ 10	$ 9

Defined Contribution Plans

The Company sponsors defined contribution plans in the U.S. and in certain non-U.S. locations, all of which are administered in accordance with local laws. The most significant defined contribution plan is the Citi Retirement Savings Plan sponsored by the Company in the U.S.

Under the Citi Retirement Savings Plan, eligible U.S. employees received matching contributions of up to 6% of their eligible compensation for 2022 and 2021, subject to statutory limits. In addition, for eligible employees whose eligible compensation is $100,000 or less, a fixed contribution of up to 2% of eligible compensation is provided. All Company contributions are invested according to participants' individual elections. The following tables summarize the Company contributions for the defined contribution plans:

	U.S. plans		
In millions of dollars	2022	2021	2020
Company contributions	$ 471	$ 436	$ 414

	Non-U.S. plans		
In millions of dollars	2022	2021	2020
Company contributions	$ 399	$ 364	$ 304

9. INCOME TAXES

Income Tax Provision

Details of the Company's income tax provision are presented below:

In millions of dollars	2022	2021	2020
Current			
Federal	$ 407	$ 522	$ 305
Non-U.S.	4,106	3,288	4,113
State	270	228	440
Total current income taxes	$ 4,783	$ 4,038	$ 4,858
Deferred			
Federal	$ (807)	$ 1,059	$(1,430)
Non-U.S.	353	8	(690)
State	(687)	346	(213)
Total deferred income taxes	$(1,141)	$ 1,413	$(2,333)
Provision for income tax on continuing operations before noncontrolling interests[1]	$ 3,642	$ 5,451	$ 2,525
Provision (benefit) for income taxes on:			
Discontinued operations	$ (41)	$ —	$ —
Gains (losses) included in *AOCI*, but excluded from net income	(1,573)	(1,684)	1,520
Employee stock plans	(8)	(6)	(4)
Opening adjustment to *Retained earnings*[2]	—	—	(911)

(1) Includes the tax on realized investment gains and impairment losses resulting in a provision (benefit) of $14 million and $(137) million in 2022, $169 million and $(57) million in 2021 and $454 million and $(14) million in 2020, respectively.

(2) 2020 reflects the tax effect of ASU 2016-13 for current expected credit losses (CECL).

Tax Rate

The reconciliation of the federal statutory income tax rate to the Company's effective income tax rate applicable to income from continuing operations (before noncontrolling interests and the cumulative effect of accounting changes) for each of the periods indicated is as follows:

	2022	2021	2020
Federal statutory rate	21.0 %	21.0 %	21.0 %
State income taxes, net of federal benefit	2.0	2.1	1.3
Non-U.S. income tax rate differential	4.3	1.6	3.5
Tax audit resolutions	(3.2)	(0.4)	0.3
Nondeductible FDIC premiums	1.0	0.6	1.3
Tax advantaged investments	(3.0)	(2.3)	(4.4)
Valuation allowance releases[1]	(2.3)	(1.7)	(4.4)
Other, net	(0.4)	(1.1)	(0.1)
Effective income tax rate	19.4 %	19.8 %	18.5 %

(1) See "Deferred Tax Assets" below for a description of the components.

As presented in the table above, Citi's effective tax rate for 2022 was 19.4%, compared to 19.8% in 2021.

Deferred Income Taxes

Deferred income taxes at December 31 related to the following:

In millions of dollars	2022	2021
Deferred tax assets		
Credit loss deduction	$ 5,162	$ 5,330
Deferred compensation and employee benefits	2,059	2,335
U.S. tax on non-U.S. earnings	1,191	1,138
Investment and loan basis differences	5,149	2,970
Tax credit and net operating loss carry-forwards	14,623	15,620
Fixed assets and leases	3,551	3,064
Other deferred tax assets	4,055	3,549
Gross deferred tax assets	$ 35,790	$ 34,006
Valuation allowance	$ 2,438	$ 4,194
Deferred tax assets after valuation allowance	$ 33,352	$ 29,812
Deferred tax liabilities		
Intangibles and leases	$ (2,271)	$ (2,446)
Non-U.S. withholding taxes	(1,142)	(987)
Debt issuances	(595)	(126)
Other deferred tax liabilities	(1,672)	(1,464)
Gross deferred tax liabilities	$ (5,680)	$ (5,023)
Net deferred tax assets	$ 27,672	$ 24,789

Unrecognized Tax Benefits

The following is a rollforward of the Company's unrecognized tax benefits:

In millions of dollars	2022	2021	2020
Total unrecognized tax benefits at January 1	**$ 1,296**	$ 861	$ 721
Increases for current year's tax positions	**55**	97	51
Increases for prior years' tax positions	**168**	515	217
Decreases for prior years' tax positions	**(119)**	(107)	(74)
Amounts of decreases relating to settlements	**(50)**	(64)	(40)
Reductions due to lapse of statutes of limitation	**(26)**	(2)	(13)
Foreign exchange, acquisitions and dispositions	**(13)**	(4)	(1)
Total unrecognized tax benefits at December 31	**$ 1,311**	$ 1,296	$ 861

The portions of the total unrecognized tax benefits at December 31, 2022, 2021 and 2020 that, if recognized, would affect Citi's tax expense are $1.0 billion, $1.0 billion and $0.7 billion, respectively. The remaining uncertain tax positions have offsetting amounts in other jurisdictions or are temporary differences.

Interest and penalties (not included in unrecognized tax benefits above) are a component of *Provision for income taxes*.

	2022		2021		2020	
In millions of dollars	**Pretax**	**Net of tax**	Pretax	Net of tax	Pretax	Net of tax
Total interest and penalties on the Consolidated Balance Sheet at January 1	**$ 214**	**$ 164**	$ 118	$ 96	$ 100	$ 82
Total interest and penalties in the Consolidated Statement of Income	**27**	**16**	32	24	14	10
Total interest and penalties on the Consolidated Balance Sheet at December 31[1]	**234**	**176**	214	164	118	96

(1) Includes $3 million, $3 million and $4 million for non-U.S. penalties in 2022, 2021 and 2020, respectively. Also includes $0 million, $0 million and $1 million for state penalties in 2022, 2021 and 2020, respectively.

As of December 31, 2022, Citi was under audit by the Internal Revenue Service and other major taxing jurisdictions around the world. It is thus reasonably possible that significant changes in the gross balance of unrecognized tax benefits may occur within the next 12 months. The potential range of amounts that could affect Citi's effective tax rate is between $0 and $500 million.

The following are the major tax jurisdictions in which the Company and its affiliates operate and the earliest tax year subject to examination:

Jurisdiction	**Tax year**
United States	2016
Mexico	2017
New York State and City	2009
United Kingdom	2016
India	2021
Singapore	2021
Hong Kong	2016
Ireland	2018

Non-U.S. Earnings

Non-U.S. pretax earnings approximated $16.2 billion in 2022, $12.9 billion in 2021 and $13.8 billion in 2020. As a U.S. corporation, Citigroup and its U.S. subsidiaries are currently subject to U.S. taxation on all non-U.S. pretax earnings of non-U.S. branches. Beginning in 2018, there is a separate foreign tax credit (FTC) basket for branches. Also, dividends from a non-U.S. subsidiary or affiliate are effectively exempt from U.S. taxation. The Company provides income taxes on the book over tax basis differences of non-U.S. subsidiaries except to the extent that such differences are indefinitely reinvested outside the U.S.

At December 31, 2022, $5.9 billion of basis differences of non-U.S. entities was indefinitely invested. At the existing tax rates (including withholding taxes), additional taxes (net of U.S. FTCs and valuation allowances) of $2.4 billion would have to be provided if such assertions were reversed.

Deferred Tax Assets

As of December 31, 2022, Citi had a valuation allowance of $2.4 billion, composed of valuation allowances of $0.9 billion on its branch basket FTC carry-forwards, $1.0 billion on its U.S. residual DTA related to its non-U.S. branches, $0.4 billion on local non-U.S. DTAs and $0.1 billion on state net operating loss carry-forwards. There was a decrease of $1.8 billion from the December 31, 2021 balance of $4.2 billion. The amount of Citi's valuation allowances (VA) may change in future years.

In 2022, Citi's VA for carry-forward FTCs in its branch basket decreased by $0.8 billion, primarily due to carry-forward expirations.

The level of branch pretax income, the local branch tax rate and the allocations of overall domestic losses (ODL) and expenses for U.S. tax purposes to the branch basket are the main factors in determining the branch VA. There was no branch basket VA release in 2022.

In Citi's general basket for FTCs, changes in the forecasted amount of income in U.S. locations derived from sources outside the U.S., in addition to tax examination changes from prior years, could alter the amount of VA that is needed against such FTCs. The remaining VA for the general basket of $0.8 billion was released, primarily due to increases in interest rates and prior-year audit adjustments.

The non-U.S. local VA decreased by $0.2 billion.

The following table summarizes Citi's DTAs:

In billions of dollars

Jurisdiction/component[1]	DTAs balance December 31, 2022	DTAs balance December 31, 2021
U.S. federal[2]		
Net operating losses (NOLs)[3]	$ 3.3	$ 3.2
Foreign tax credits (FTCs)	1.9	2.8
General business credits (GBCs)	5.2	4.5
Future tax deductions and credits	10.1	8.4
Total U.S. federal	$ 20.5	$ 18.9
State and local		
New York NOLs	$ 1.9	$ 1.2
Other state NOLs	0.2	0.2
Future tax deductions	2.2	1.8
Total state and local	$ 4.3	$ 3.2
Non-U.S.		
NOLs	$ 0.7	$ 0.5
Future tax deductions	2.2	2.2
Total non-U.S.	$ 2.9	$ 2.7
Total	$ 27.7	$ 24.8

(1) All amounts are net of valuation allowances.
(2) Included in the net U.S. federal DTAs of $20.5 billion as of December 31, 2022 were deferred tax liabilities of $3.3 billion that will reverse in the relevant carry-forward period and may be used to support the DTAs.
(3) Consists of non-consolidated tax return NOL carry-forwards that are eventually expected to be utilized in Citigroup's consolidated tax return.

The following table summarizes the amounts of tax carry-forwards and their expiration dates:

In billions of dollars

Year of expiration	December 31, 2022	December 31, 2021
U.S. tax return general basket foreign tax credit carry-forwards[1]		
2022	$ —	$ 0.5
2023	—	0.4
2025	0.8	1.5
2027	1.1	1.1
Total U.S. tax return general basket foreign tax credit carry-forwards	$ 1.9	$ 3.5
U.S. tax return branch basket foreign tax credit carry-forwards[1]		
2022	$ —	$ 1.0
2028	0.7	0.6
2029	0.2	0.2
Total U.S. tax return branch basket foreign tax credit carry-forwards	$ 0.9	$ 1.8
U.S. tax return general business credit carry-forwards		
2032	$ 0.4	$ 0.4
2033	0.3	0.3
2034	0.2	0.2
2035	0.2	0.2
2036	0.2	0.2
2037	0.5	0.5
2038	0.5	0.5
2039	0.7	0.7
2040	0.7	0.7
2041	0.8	0.8
2042	0.7	—
Total U.S. tax return general business credit carry-forwards	$ 5.2	$ 4.5
U.S. subsidiary separate federal NOL carry-forwards		
2027	$ 0.1	$ 0.1
2028	0.1	0.1
2030	0.3	0.3
2033	1.6	1.6
2034	2.0	2.0
2035	3.3	3.3
2036	2.1	2.1
2037	1.0	1.0
Unlimited carry-forward period	5.3	4.6
Total U.S. subsidiary separate federal NOL carry-forwards[2]	$ 15.8	$ 15.1
New York State NOL carry-forwards[2]		
2034	$ 11.5	$ 6.6
New York City NOL carry-forwards[2]		
2034	$ 10.3	$ 7.2
Non-U.S. NOL carry-forwards[1]		
Various	$ 1.1	$ 1.1

(1) Before valuation allowance.
(2) Pretax.

The time remaining for utilization of the FTC component has shortened, given the passage of time. Although realization is not assured, Citi believes that the realization of the recognized net DTAs of $27.7 billion at December 31, 2022 is more-likely-than-not, based upon expectations as to future taxable income in the jurisdictions in which the DTAs arise and consideration of available tax planning strategies (as defined in ASC 740, *Income Taxes*).

The majority of Citi's U.S. federal net operating loss carry-forward and all of its New York State and City net operating loss carry-forwards are subject to a carry-forward period of 20 years. This provides enough time to fully utilize the DTAs pertaining to these existing NOL carry-forwards. This is due to Citi's forecast of sufficient U.S. taxable income and because New York State and City continue to tax Citi's non-U.S. income.

With respect to the FTCs component of the DTAs, the carry-forward period is 10 years. Utilization of FTCs in any year is generally limited to 21% of foreign source taxable income in that year. However, ODL that Citi has incurred of approximately $8 billion as of December 31, 2022 are allowed to be reclassified as foreign source income to the extent of 50%–100% (at taxpayer's election) of domestic source income produced in subsequent years. Such resulting foreign source income would support the realization of the FTC carry-forwards after VA. As noted in the tables above, Citi's FTC carry-forwards were $1.9 billion ($2.8 billion before VA) as of December 31, 2022, compared to $2.8 billion ($5.3 billion before VA) as of December 31, 2021. Citi believes that it will more-likely-than-not generate sufficient U.S. taxable income within the 10-year carry-forward period to be able to utilize the net FTCs after the VA, after considering any FTCs produced in the tax return for such period, which must be used prior to any carry-forward utilization.

10. EARNINGS PER SHARE

The following table reconciles the income and share data used in the basic and diluted earnings per share (EPS) computations:

In millions of dollars, except per share amounts	2022	2021	2020
Earnings per common share			
Income from continuing operations before attribution of noncontrolling interests	**$ 15,165**	$ 22,018	$ 11,107
Less: Noncontrolling interests from continuing operations	**89**	73	40
Net income from continuing operations (for EPS purposes)	**$ 15,076**	$ 21,945	$ 11,067
Loss from discontinued operations, net of taxes	**(231)**	7	(20)
Citigroup's net income	**$ 14,845**	$ 21,952	$ 11,047
Less: Preferred dividends[1]	**1,032**	1,040	1,095
Net income available to common shareholders	**$ 13,813**	$ 20,912	$ 9,952
Less: Dividends and undistributed earnings allocated to employee restricted and deferred shares with rights to dividends, applicable to basic EPS	**113**	154	73
Net income allocated to common shareholders for basic EPS	**$ 13,700**	$ 20,758	$ 9,879
Weighted-average common shares outstanding applicable to basic EPS *(in millions)*	**1,946.7**	2,033.0	2,085.8
Basic earnings per share[2]			
Income from continuing operations	**$ 7.16**	$ 10.21	$ 4.75
Discontinued operations	**(0.12)**	—	(0.01)
Net income per share—basic	**$ 7.04**	$ 10.21	$ 4.74
Diluted earnings per share			
Net income allocated to common shareholders for basic EPS	**$ 13,700**	$ 20,758	$ 9,879
Add back: Dividends allocated to employee restricted and deferred shares with rights to dividends that are forfeitable	**41**	31	30
Net income allocated to common shareholders for diluted EPS	**$ 13,741**	$ 20,789	$ 9,909
Weighted-average common shares outstanding applicable to basic EPS *(in millions)*	**$ 1,946.7**	$ 2,033.0	$ 2,085.8
Effect of dilutive securities			
Options[3]	**—**	—	0.1
Other employee plans	**17.6**	16.4	13.1
Adjusted weighted-average common shares outstanding applicable to diluted EPS *(in millions)*[4]	**1,964.3**	2,049.4	2,099.0
Diluted earnings per share[2]			
Income from continuing operations	**$ 7.11**	$ 10.14	$ 4.73
Discontinued operations	**(0.12)**	—	(0.01)
Net income per share—diluted	**$ 7.00**	$ 10.14	$ 4.72

(1) See Note 21 for the potential future impact of preferred stock dividends.
(2) Due to rounding, earnings per share on continuing operations and discontinued operations may not sum to earnings per share on net income.
(3) During 2022 and 2021, there were no weighted-average options outstanding. During 2020, weighted-average options to purchase 0.1 million shares of common stock were outstanding but not included in the computation of earnings per share because the weighted-average exercise price of $56.25 per share was anti-dilutive.
(4) Due to rounding, weighted-average common shares outstanding applicable to basic EPS and the effect of dilutive securities may not sum to weighted-average common shares outstanding applicable to diluted EPS.

11. SECURITIES BORROWED, LOANED AND SUBJECT TO REPURCHASE AGREEMENTS

Securities borrowed and purchased under agreements to resell, at their respective carrying values, consisted of the following:

	December 31,	
In millions of dollars	**2022**	2021
Securities purchased under agreements to resell	**$ 291,272**	$ 236,252
Deposits paid for securities borrowed	**74,165**	91,042
Total, net[1]	**$ 365,437**	$ 327,294
Allowance for credit losses on securities purchased and borrowed[2]	**(36)**	(6)
Total, net of allowance	**$ 365,401**	$ 327,288

Securities loaned and sold under agreements to repurchase, at their respective carrying values, consisted of the following:

	December 31,	
In millions of dollars	**2022**	2021
Securities sold under agreements to repurchase	**$ 183,827**	$ 174,255
Deposits received for securities loaned	**18,617**	17,030
Total, net[1]	**$ 202,444**	$ 191,285

(1) The above tables do not include securities-for-securities lending transactions of $4.4 billion and $3.6 billion at December 31, 2022 and 2021, respectively, where the Company acts as lender and receives securities that can be sold or pledged as collateral. In these transactions, the Company recognizes the securities received at fair value within *Other assets* and the obligation to return those securities as a liability within *Brokerage payables*.

(2) See Note 15 for further information.

The resale and repurchase agreements represent collateralized financing transactions. Citi executes these transactions primarily through its broker-dealer subsidiaries to facilitate customer matched-book activity and to efficiently fund a portion of Citi's trading inventory. Transactions executed by Citi's bank subsidiaries primarily facilitate customer financing activity.

To maintain reliable funding under a wide range of market conditions, including under periods of stress, Citi manages these activities by taking into consideration the quality of the underlying collateral and stipulating financing tenor. Citi manages the risks in its collateralized financing transactions by conducting daily stress tests to account for changes in capacity, tenors, haircut, collateral profile and client actions. In addition, Citi maintains counterparty diversification by establishing concentration triggers and assessing counterparty reliability and stability under stress.

It is the Company's policy to take possession of the underlying collateral, monitor its market value relative to the amounts due under the agreements and, when necessary, require prompt transfer of additional collateral in order to maintain contractual margin protection. For resale and repurchase agreements, when necessary, the Company posts additional collateral in order to maintain contractual margin protection.

Collateral typically consists of government and government-agency securities, corporate and municipal bonds, equities and mortgage- and other asset-backed securities.

The resale and repurchase agreements are generally documented under industry standard agreements that allow the prompt close-out of all transactions (including the liquidation of securities held) and the offsetting of obligations to return cash or securities by the non-defaulting party, following a payment default or other type of default under the relevant master agreement. Events of default generally include (i) failure to deliver cash or securities as required under the transaction, (ii) failure to provide or return cash or securities as used for margining purposes, (iii) breach of representation, (iv) cross-default to another transaction entered into among the parties, or, in some cases, their affiliates and (v) a repudiation of obligations under the agreement. The counterparty that receives the securities in these transactions is generally unrestricted in its use of the securities, with the exception of transactions executed on a tri-party basis, where the collateral is maintained by a custodian and operational limitations may restrict its use of the securities.

A substantial portion of the resale and repurchase agreements is recorded at fair value as the Company elected the fair value option, as described in Notes 25 and 26. The remaining portion is carried at the amount of cash initially advanced or received, plus accrued interest, as specified in the respective agreements.

The securities borrowing and lending agreements also represent collateralized financing transactions similar to the resale and repurchase agreements. Collateral typically consists of government and government-agency securities and corporate debt and equity securities.

Similar to the resale and repurchase agreements, securities borrowing and lending agreements are generally documented under industry standard agreements that allow the prompt close-out of all transactions (including the liquidation of securities held) and the offsetting of obligations to return cash or securities by the non-defaulting party, following a payment default or other default by the other party under the relevant master agreement. Events of default and rights to use securities under the securities borrowing and lending agreements are similar to the resale and repurchase agreements referenced above.

A substantial portion of securities borrowing and lending agreements is recorded at the amount of cash advanced or received. The remaining portion is recorded at fair value as the Company elected the fair value option for certain securities borrowed and loaned portfolios, as described in Note 26. With respect to securities loaned, the Company receives cash collateral in an amount generally in excess of the market value of the securities loaned. The Company monitors the market value of securities borrowed and securities loaned on a daily basis and posts or obtains additional collateral in order to maintain contractual margin protection.

The enforceability of offsetting rights incorporated in the master netting agreements for resale and repurchase agreements, and securities borrowing and lending agreements, is evidenced to the extent that (i) a supportive legal opinion has been obtained from counsel of recognized standing that provides the requisite level of certainty regarding the enforceability of these agreements and (ii) the exercise of rights by the non-defaulting party to terminate and close out transactions on a net basis under these agreements will not be stayed or avoided under applicable law upon an event of default including bankruptcy, insolvency or similar proceeding.

A legal opinion may not have been sought or obtained for certain jurisdictions where local law is silent or sufficiently ambiguous to determine the enforceability of offsetting rights or where adverse case law or conflicting regulation may cast doubt on the enforceability of such rights. In some jurisdictions and for some counterparty types, the insolvency law for a particular counterparty type may be nonexistent or unclear as overlapping regimes may exist. For example, this may be the case for certain sovereigns, municipalities, central banks and U.S. pension plans.

The following tables present the gross and net resale and repurchase agreements and securities borrowing and lending agreements and the related offsetting amounts permitted under ASC 210-20-45. The tables also include amounts related to financial instruments that are not permitted to be offset under ASC 210-20-45, but would be eligible for offsetting to the extent that an event of default has occurred and a legal opinion supporting enforceability of the offsetting rights has been obtained. Remaining exposures continue to be secured by financial collateral, but the Company may not have sought or been able to obtain a legal opinion evidencing enforceability of the offsetting right.

	As of December 31, 2022				
In millions of dollars	**Gross amounts of recognized assets**	**Gross amounts offset on the Consolidated Balance Sheet[1]**	**Net amounts of assets included on the Consolidated Balance Sheet**	**Amounts not offset on the Consolidated Balance Sheet but eligible for offsetting upon counterparty default[2]**	**Net amounts[3]**
Securities purchased under agreements to resell	**$ 403,663**	**$ 112,391**	**$ 291,272**	**$ 204,077**	**$ 87,195**
Deposits paid for securities borrowed	**88,817**	**14,652**	**74,165**	**13,844**	**60,321**
Total	**$ 492,480**	**$ 127,043**	**$ 365,437**	**$ 217,921**	**$ 147,516**

In millions of dollars	**Gross amounts of recognized liabilities**	**Gross amounts offset on the Consolidated Balance Sheet[1]**	**Net amounts of liabilities included on the Consolidated Balance Sheet**	**Amounts not offset on the Consolidated Balance Sheet but eligible for offsetting upon counterparty default[2]**	**Net amounts[3]**
Securities sold under agreements to repurchase	**$ 296,218**	**$ 112,391**	**$ 183,827**	**$ 71,635**	**$ 112,192**
Deposits received for securities loaned	**33,269**	**14,652**	**18,617**	**2,542**	**16,075**
Total	**$ 329,487**	**$ 127,043**	**$ 202,444**	**$ 74,177**	**$ 128,267**

	As of December 31, 2021				
In millions of dollars	Gross amounts of recognized assets	Gross amounts offset on the Consolidated Balance Sheet[1]	Net amounts of assets included on the Consolidated Balance Sheet	Amounts not offset on the Consolidated Balance Sheet but eligible for offsetting upon counterparty default[2]	Net amounts[3]
Securities purchased under agreements to resell	$ 367,594	$ 131,342	$ 236,252	$ 205,349	$ 30,903
Deposits paid for securities borrowed	107,041	15,999	91,042	17,326	73,716
Total	$ 474,635	$ 147,341	$ 327,294	$ 222,675	$ 104,619

In millions of dollars	Gross amounts of recognized liabilities	Gross amounts offset on the Consolidated Balance Sheet[1]	Net amounts of liabilities included on the Consolidated Balance Sheet	Amounts not offset on the Consolidated Balance Sheet but eligible for offsetting upon counterparty default[2]	Net amounts[3]
Securities sold under agreements to repurchase	$ 305,597	$ 131,342	$ 174,255	$ 85,184	$ 89,071
Deposits received for securities loaned	33,029	15,999	17,030	2,868	14,162
Total	$ 338,626	$ 147,341	$ 191,285	$ 88,052	$ 103,233

(1) Includes financial instruments subject to enforceable master netting agreements that are permitted to be offset under ASC 210-20-45.
(2) Includes financial instruments subject to enforceable master netting agreements that are not permitted to be offset under ASC 210-20-45, but would be eligible for offsetting to the extent that an event of default has occurred and a legal opinion supporting enforceability of the offsetting right has been obtained.
(3) Remaining exposures continue to be secured by financial collateral, but the Company may not have sought or been able to obtain a legal opinion evidencing enforceability of the offsetting right.

The following tables present the gross amounts of liabilities associated with repurchase agreements and securities lending agreements by remaining contractual maturity:

	As of December 31, 2022				
In millions of dollars	**Open and overnight**	**Up to 30 days**	**31–90 days**	**Greater than 90 days**	**Total**
Securities sold under agreements to repurchase	**$ 138,710**	**$ 86,819**	**$ 25,119**	**$ 45,570**	**$ 296,218**
Deposits received for securities loaned	**25,388**	**267**	**2,121**	**5,493**	**33,269**
Total	**$ 164,098**	**$ 87,086**	**$ 27,240**	**$ 51,063**	**$ 329,487**

	As of December 31, 2021				
In millions of dollars	Open and overnight	Up to 30 days	31–90 days	Greater than 90 days	Total
Securities sold under agreements to repurchase	$ 127,679	$ 93,257	$ 32,908	$ 51,753	$ 305,597
Deposits received for securities loaned	23,387	6	1,392	8,244	33,029
Total	$ 151,066	$ 93,263	$ 34,300	$ 59,997	$ 338,626

The following tables present the gross amounts of liabilities associated with repurchase agreements and securities lending agreements by class of underlying collateral:

	As of December 31, 2022		
In millions of dollars	**Repurchase agreements**	**Securities lending agreements**	**Total**
U.S. Treasury and federal agency securities	**$ 99,979**	**$ 106**	**$ 100,085**
State and municipal securities	**1,911**	**—**	**1,911**
Foreign government securities	**123,826**	**13**	**123,839**
Corporate bonds	**14,308**	**45**	**14,353**
Equity securities	**9,749**	**33,096**	**42,845**
Mortgage-backed securities	**36,225**	**—**	**36,225**
Asset-backed securities	**1,755**	**—**	**1,755**
Other	**8,465**	**9**	**8,474**
Total	**$ 296,218**	**$ 33,269**	**$ 329,487**

In millions of dollars	As of December 31, 2021		
	Repurchase agreements	Securities lending agreements	Total
U.S. Treasury and federal agency securities	$ 85,861	$ 90	$ 85,951
State and municipal securities	1,053	—	1,053
Foreign government securities	133,352	212	133,564
Corporate bonds	20,398	152	20,550
Equity securities	25,653	32,517	58,170
Mortgage-backed securities	33,573	—	33,573
Asset-backed securities	1,681	—	1,681
Other	4,026	58	4,084
Total	$ 305,597	$ 33,029	$ 338,626

12. BROKERAGE RECEIVABLES AND BROKERAGE PAYABLES

The Company has receivables and payables for financial instruments sold to and purchased from brokers, dealers and customers, which arise in the ordinary course of business. Citi is exposed to risk of loss from the inability of brokers, dealers or customers to pay for purchases or to deliver the financial instruments sold, in which case Citi would have to sell or purchase the financial instruments at prevailing market prices. Credit risk is reduced to the extent that an exchange or clearing organization acts as a counterparty to the transaction and replaces the broker, dealer or customer in question.

Citi seeks to protect itself from the risks associated with customer activities by requiring customers to maintain margin collateral in compliance with regulatory and internal guidelines. Margin levels are monitored daily, and customers deposit additional collateral as required. Where customers cannot meet collateral requirements, Citi may liquidate sufficient underlying financial instruments to bring the customer into compliance with the required margin level.

Exposure to credit risk is impacted by market volatility, which may impair the ability of clients to satisfy their obligations to Citi. Credit limits are established and closely monitored for customers and for brokers and dealers engaged in forwards, futures and other transactions deemed to be credit sensitive.

Brokerage receivables and *Brokerage payables* consisted of the following:

	December 31,	
In millions of dollars	**2022**	2021
Receivables from customers	$ **15,462**	$ 26,403
Receivables from brokers, dealers and clearing organizations	**38,730**	27,937
Total brokerage receivables[1]	$ **54,192**	$ 54,340
Payables to customers	$ **55,747**	$ 52,158
Payables to brokers, dealers and clearing organizations	**13,471**	9,272
Total brokerage payables[1]	$ **69,218**	$ 61,430

(1) Includes brokerage receivables and payables recorded by Citi broker-dealer entities that are accounted for in accordance with the AICPA Accounting Guide for Brokers and Dealers in Securities as codified in ASC 940-320.

13. INVESTMENTS

The following table presents Citi's investments by category:

	December 31,	
In millions of dollars	**2022**	2021
Debt securities available-for-sale (AFS)	**$ 249,679**	$ 288,522
Debt securities held-to-maturity (HTM)[1]	**268,863**	216,963
Marketable equity securities carried at fair value[2]	**429**	543
Non-marketable equity securities carried at fair value[2][5]	**466**	489
Non-marketable equity securities measured using the measurement alternative[3]	**1,676**	1,413
Non-marketable equity securities carried at cost[4]	**5,469**	4,892
Total investments[6]	**$ 526,582**	$ 512,822

(1) Carried at adjusted amortized cost basis, net of any ACL.
(2) Unrealized gains and losses are recognized in earnings.
(3) Impairment losses and adjustments to the carrying value as a result of observable price changes are recognized in earnings. See "Non-Marketable Equity Securities Not Carried at Fair Value" below.
(4) Represents shares issued by the Federal Reserve Bank, Federal Home Loan Banks and certain exchanges of which Citigroup is a member.
(5) Includes $27 million and $145 million of investments in funds for which the fair values are estimated using the net asset value of the Company's ownership interest in the funds at December 31, 2022 and 2021, respectively.
(6) Not included in the balances above is approximately $2 billion of accrued interest receivable at December 31, 2022, which is included in *Other assets* on the Consolidated Balance Sheet. The Company does not recognize an allowance for credit losses on accrued interest receivable for AFS and HTM debt securities, consistent with its non-accrual policy, which results in timely write-off of accrued interest. The Company did not reverse through interest income any accrued interest receivables for the years ended December 31, 2022 and 2021.

The following table presents interest and dividend income on investments:

In millions of dollars	**2022**	2021	2020
Taxable interest	**$ 10,643**	$ 6,975	$ 7,554
Interest exempt from U.S. federal income tax	**348**	279	301
Dividend income	**223**	134	134
Total interest and dividend income on investments	**$ 11,214**	$ 7,388	$ 7,989

The following table presents realized gains and losses on the sales of investments, which exclude impairment losses:

In millions of dollars	**2022**	2021	2020
Gross realized investment gains	**$ 323**	$ 860	$ 1,895
Gross realized investment losses	**(256)**	(195)	(139)
Net realized gains on sales of investments	**$ 67**	$ 665	$ 1,756

Debt Securities Available-for-Sale

The amortized cost and fair value of AFS debt securities were as follows:

	December 31, 2022					December 31, 2021				
In millions of dollars	Amortized cost	Gross unrealized gains	Gross unrealized losses	Allowance for credit losses	Fair value	Amortized cost	Gross unrealized gains	Gross unrealized losses	Allowance for credit losses	Fair value
Debt securities AFS										
Mortgage-backed securities[1]										
U.S. government-sponsored agency guaranteed[2]	$ 12,009	$ 8	$ 755	$ —	$ 11,262	$ 33,064	$ 453	$ 301	$ —	$ 33,216
Residential	488	—	3	—	485	380	1	1	—	380
Commercial	2	—	—	—	2	25	—	—	—	25
Total mortgage-backed securities	$ 12,499	$ 8	$ 758	$ —	$ 11,749	$ 33,469	$ 454	$ 302	$ —	$ 33,621
U.S. Treasury and federal agency securities										
U.S. Treasury	$ 94,732	$ 50	$ 2,492	$ —	$ 92,290	$ 122,669	$ 615	$ 844	$ —	$ 122,440
Agency obligations	—	—	—	—	—	—	—	—	—	—
Total U.S. Treasury and federal agency securities	$ 94,732	$ 50	$ 2,492	$ —	$ 92,290	$ 122,669	$ 615	$ 844	$ —	$ 122,440
State and municipal[2]	$ 2,363	$ 19	$ 159	$ —	$ 2,223	$ 2,643	$ 79	$ 101	$ —	$ 2,621
Foreign government	135,648	569	2,940	—	133,277	119,426	337	1,023	—	118,740
Corporate	5,146	19	246	3	4,916	5,972	33	77	8	5,920
Asset-backed securities[1]	1,022	12	4	—	1,030	304	—	1	—	303
Other debt securities	4,198	1	5	—	4,194	4,880	1	4	—	4,877
Total debt securities AFS	$ 255,608	$ 678	$ 6,604	$ 3	$ 249,679	$ 289,363	$ 1,519	$ 2,352	$ 8	$ 288,522

(1) The Company invests in mortgage- and asset-backed securities, which are typically issued by VIEs through securitization transactions. The Company's maximum exposure to loss from these VIEs is equal to the carrying amount of the securities, which is reflected in the table above. See Note 22 for mortgage- and asset-backed securitizations in which the Company has other involvement.

(2) In 2022, Citibank transferred $21.5 billion of agency residential mortgage-backed securities and $165 million of municipal bonds from AFS classification to HTM classification in accordance with ASC 320. At the time of transfer, the securities and bonds were in an unrealized loss position of $2.3 billion and $12 million, respectively. The loss amounts will remain in *AOCI* and will be amortized over the remaining life of the securities and bonds.

At December 31, 2022, the amortized cost of AFS fixed income securities for those in a loss position exceeded their fair value by $6,604 million. Of the $6,604 million, $3,997 million represented unrealized losses on fixed income investments that have been in a gross unrealized loss position for less than a year and, of these, 73% were rated investment grade; and $2,607 million represented unrealized losses on fixed income investments that have been in a gross unrealized loss position for a year or more and, of these, 99% were rated investment grade. Of the $2,607 million, $1,491 million represents U.S. Treasury and federal agency securities.

The following table shows the fair value of AFS debt securities that have been in an unrealized loss position:

In millions of dollars	Less than 12 months		12 months or longer		Total	
	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses
December 31, 2022						
Debt securities AFS						
Mortgage-backed securities						
U.S. government-sponsored agency guaranteed	$ 7,908	$ 412	$ 3,290	$ 343	$ 11,198	$ 755
Residential	158	3	1	—	159	3
Commercial	1	—	1	—	2	—
Total mortgage-backed securities	$ 8,067	$ 415	$ 3,292	$ 343	$ 11,359	$ 758
U.S. Treasury and federal agency securities						
U.S. Treasury	$ 40,701	$ 1,001	$ 34,692	$ 1,491	$ 75,393	$ 2,492
Agency obligations	—	—	—	—	—	—
Total U.S. Treasury and federal agency securities	$ 40,701	$ 1,001	$ 34,692	$ 1,491	$ 75,393	$ 2,492
State and municipal	$ 896	$ 31	$ 707	$ 128	$ 1,603	$ 159
Foreign government	82,900	2,332	14,220	608	97,120	2,940
Corporate	3,082	209	784	37	3,866	246
Asset-backed securities	708	4	—	—	708	4
Other debt securities	2,213	5	—	—	2,213	5
Total debt securities AFS	$ 138,567	$ 3,997	$ 53,695	$ 2,607	$ 192,262	$ 6,604
December 31, 2021						
Debt securities AFS						
Mortgage-backed securities						
U.S. government-sponsored agency guaranteed	$ 17,039	$ 270	$ 698	$ 31	$ 17,737	$ 301
Residential	96	1	1	—	97	1
Commercial	—	—	—	—	—	—
Total mortgage-backed securities	$ 17,135	$ 271	$ 699	$ 31	$ 17,834	$ 302
U.S. Treasury and federal agency securities						
U.S. Treasury	$ 56,448	$ 713	$ 6,310	$ 131	$ 62,758	$ 844
Agency obligations	—	—	—	—	—	—
Total U.S. Treasury and federal agency securities	$ 56,448	$ 713	$ 6,310	$ 131	$ 62,758	$ 844
State and municipal	$ 229	$ 3	$ 874	$ 98	$ 1,103	$ 101
Foreign government	64,319	826	9,924	197	74,243	1,023
Corporate	2,655	77	22	—	2,677	77
Asset-backed securities	108	1	—	—	108	1
Other debt securities	3,439	4	—	—	3,439	4
Total debt securities AFS	$ 144,333	$ 1,895	$ 17,829	$ 457	$ 162,162	$ 2,352

The following table presents the amortized cost and fair value of AFS debt securities by contractual maturity dates:

	December 31,					
	2022			2021		
In millions of dollars	Amortized cost	Fair value	Weighted average yield[1]	Amortized cost	Fair value	Weighted average yield[1]
Mortgage-backed securities[2]						
Due within 1 year	$ 42	$ 44	2.02 %	$ 188	$ 189	0.79 %
After 1 but within 5 years	523	513	2.31	211	211	1.07
After 5 but within 10 years	468	440	3.46	523	559	3.41
After 10 years	11,466	10,752	3.46	32,547	32,662	2.73
Total	$ 12,499	$ 11,749	3.41 %	$ 33,469	$ 33,621	2.72 %
U.S. Treasury and federal agency securities						
Due within 1 year	$ 25,935	$ 25,829	2.81 %	$ 34,321	$ 34,448	1.05 %
After 1 but within 5 years	68,455	66,166	1.17	87,987	87,633	0.81
After 5 but within 10 years	342	295	2.53	361	359	1.42
After 10 years	—	—	—	—	—	—
Total	$ 94,732	$ 92,290	1.62 %	$ 122,669	$ 122,440	0.87 %
State and municipal						
Due within 1 year	$ 19	$ 18	1.79 %	$ 40	$ 40	2.09 %
After 1 but within 5 years	94	92	3.07	121	124	3.16
After 5 but within 10 years	305	302	3.55	156	161	3.18
After 10 years	1,945	1,811	3.51	2,326	2,296	3.15
Total	$ 2,363	$ 2,223	3.49 %	$ 2,643	$ 2,621	3.14 %
Foreign government						
Due within 1 year	$ 64,795	$ 64,479	4.25 %	$ 49,263	$ 49,223	2.53 %
After 1 but within 5 years	67,935	66,150	4.80	64,555	63,961	3.14
After 5 but within 10 years	2,491	2,250	2.86	3,736	3,656	1.72
After 10 years	427	398	3.80	1,872	1,900	1.52
Total	$ 135,648	$ 133,277	4.50 %	$ 119,426	$ 118,740	2.82 %
All other[3]						
Due within 1 year	$ 4,452	$ 4,441	1.52 %	$ 5,175	$ 5,180	0.94 %
After 1 but within 5 years	5,162	4,988	4.82	5,177	5,149	1.91
After 5 but within 10 years	695	693	11.35	750	750	2.08
After 10 years	57	18	3.81	54	21	4.28
Total	$ 10,366	$ 10,140	3.83 %	$ 11,156	$ 11,100	1.48 %
Total debt securities AFS	$ 255,608	$ 249,679	3.34 %	$ 289,363	$ 288,522	1.94 %

(1) Weighted average yields are weighted based on the amortized cost of each security. The average yield considers the contractual coupon, amortization of premiums and accretion of discounts and excludes the effects of any related hedging derivatives.

(2) Includes mortgage-backed securities of U.S. government-sponsored agencies. The Company invests in mortgage- and asset-backed securities, which are typically issued by VIEs through securitization transactions.

(3) Includes corporate, asset-backed and other debt securities.

Debt Securities Held-to-Maturity

The carrying value and fair value of debt securities HTM were as follows:

In millions of dollars	Amortized cost, net[1]	Gross unrealized gains	Gross unrealized losses	Fair value
December 31, 2022				
Debt securities HTM				
Mortgage-backed securities[2]				
U.S. government-sponsored agency guaranteed[3]	$ 90,063	$ 58	$ 10,033	$ 80,088
Non-U.S. residential	445	—	—	445
Commercial	1,114	5	1	1,118
Total mortgage-backed securities	$ 91,622	$ 63	$ 10,034	$ 81,651
U.S. Treasury securities	$ 134,961	$ —	$ 13,722	$ 121,239
State and municipal[4]	9,237	34	764	8,507
Foreign government	2,075	—	93	1,982
Asset-backed securities[2]	30,968	4	703	30,269
Total debt securities HTM, net	$ 268,863	$ 101	$ 25,316	$ 243,648
December 31, 2021				
Debt securities HTM				
Mortgage-backed securities[2]				
U.S. government-sponsored agency guaranteed	$ 63,885	$ 1,076	$ 925	$ 64,036
Non-U.S. residential	736	3	—	739
Commercial	1,070	4	2	1,072
Total mortgage-backed securities	$ 65,691	$ 1,083	$ 927	$ 65,847
U.S. Treasury securities	$ 111,819	$ 30	$ 1,632	$ 110,217
State and municipal	8,923	589	12	9,500
Foreign government	1,651	4	36	1,619
Asset-backed securities[2]	28,879	8	32	28,855
Total debt securities HTM, net	$ 216,963	$ 1,714	$ 2,639	$ 216,038

(1) Amortized cost is reported net of ACL of $120 million and $87 million at December 31, 2022 and December 31, 2021, respectively.

(2) The Company invests in mortgage- and asset-backed securities. These securitizations are generally considered VIEs. The Company's maximum exposure to loss from these VIEs is equal to the carrying amount of the securities, which is reflected in the table above. See Note 22 for mortgage- and asset-backed securitizations in which the Company has other involvement.

(3) In 2022, Citibank transferred $21.5 billion of agency residential mortgage-backed securities and $165 million of municipal bonds from AFS classification to HTM classification in accordance with ASC 320. At the time of transfer, the securities and bonds were in an unrealized loss position of $2.3 billion and $12 million, respectively. The loss amounts will remain in *AOCI* and will be amortized over the remaining life of the securities and bonds.

The Company has the positive intent and ability to hold these securities to maturity or, where applicable, until the exercise of any issuer call option, absent any unforeseen significant changes in circumstances, including deterioration in credit or changes in regulatory capital requirements.

The net unrealized losses classified in *AOCI* for HTM debt securities primarily relate to debt securities previously classified as AFS that were transferred to HTM, and include any cumulative fair value hedge adjustments. The net unrealized loss amount also includes any non-credit-related changes in fair value of HTM debt securities that have suffered credit impairment recorded in earnings. The *AOCI* balance related to HTM debt securities is amortized as an adjustment of yield, in a manner consistent with the accretion of any difference between the carrying value at the transfer date and par value of the same debt securities.

The following table presents the carrying value and fair value of HTM debt securities by contractual maturity dates:

	December 31,					
	2022			2021		
In millions of dollars	Amortized cost[1]	Fair value	Weighted average yield[2]	Amortized cost[1]	Fair value	Weighted average yield[2]
Mortgage-backed securities						
Due within 1 year	$ 27	$ 27	2.93 %	$ 152	$ 151	1.70 %
After 1 but within 5 years	520	505	3.84	684	725	3.01
After 5 but within 10 years	1,496	1,374	2.74	1,655	1,739	2.74
After 10 years	89,579	79,745	2.89	63,200	63,232	2.55
Total	$ 91,622	$ 81,651	2.90 %	$ 65,691	$ 65,847	2.56 %
U.S. Treasury securities						
Due within 1 year	$ 3,148	$ 3,017	0.18 %	$ —	$ —	— %
After 1 but within 5 years	86,617	79,104	1.04	65,498	64,516	0.69
After 5 but within 10 years	45,196	39,118	1.16	46,321	45,701	1.15
After 10 years	—	—	—	—	—	—
Total	$ 134,961	$ 121,239	1.06 %	$ 111,819	$ 110,217	0.88 %
State and municipal						
Due within 1 year	$ 22	$ 21	2.73 %	$ 51	$ 50	3.82 %
After 1 but within 5 years	102	100	2.99	166	170	2.82
After 5 but within 10 years	1,002	967	3.16	908	951	3.23
After 10 years	8,111	7,419	3.32	7,798	8,329	2.65
Total	$ 9,237	$ 8,507	3.30 %	$ 8,923	$ 9,500	2.72 %
Foreign government						
Due within 1 year	$ 143	$ 139	10.83 %	$ 292	$ 291	7.86 %
After 1 but within 5 years	1,932	1,843	9.94	1,359	1,328	6.30
After 5 but within 10 years	—	—	—	—	—	—
After 10 years	—	—	—	—	—	—
Total	$ 2,075	$ 1,982	10.00 %	$ 1,651	$ 1,619	6.58 %
All other[3]						
Due within 1 year	$ —	$ —	— %	$ —	$ —	— %
After 1 but within 5 years	—	—	—	—	—	—
After 5 but within 10 years	11,751	11,583	2.81	11,520	11,515	2.78
After 10 years	19,217	18,686	1.53	17,359	17,340	1.34
Total	$ 30,968	$ 30,269	2.02 %	$ 28,879	$ 28,855	1.92 %
Total debt securities HTM	$ 268,863	$ 243,648	1.94 %	$ 216,963	$ 216,038	1.65 %

(1) Amortized cost is reported net of ACL of $120 million and $87 million at December 31, 2022 and 2021, respectively.
(2) Weighted average yields are weighted based on the amortized cost of each security. The average yield considers the contractual coupon, amortization of premiums and accretion of discounts and excludes the effects of any related hedging derivatives.
(3) Includes corporate and asset-backed securities.

HTM Debt Securities Delinquency and Non-Accrual Details

Citi did not have any HTM debt securities that were delinquent or on non-accrual status at December 31, 2022 and 2021.

There were no purchased credit-deteriorated HTM debt securities held by the Company as of December 31, 2022 and 2021.

Evaluating Investments for Impairment

AFS Debt Securities

Overview—AFS Debt Securities
The Company conducts periodic reviews of all AFS debt securities with unrealized losses to evaluate whether the impairment resulted from expected credit losses or from other factors and to evaluate the Company's intent to sell such securities.

An AFS debt security is impaired when the current fair value of an individual AFS debt security is less than its amortized cost basis.

The Company recognizes the entire difference between amortized cost basis and fair value in earnings for impaired AFS debt securities that Citi has an intent to sell or for which Citi believes it will more-likely-than-not be required to sell prior to recovery of the amortized cost basis. However, for those AFS debt securities that the Company does not intend to sell and is not likely to be required to sell, only the credit-related impairment is recognized in earnings by recording an allowance for credit losses. Any remaining fair value decline for such securities is recorded in *AOCI*. The Company does not consider the length of time that the fair value of a security is below its amortized cost when determining if a credit loss exists.

For AFS debt securities, credit losses exist where Citi does not expect to receive contractual principal and interest cash flows sufficient to recover the entire amortized cost basis of a security. The allowance for credit losses is limited to the amount by which the AFS debt security's amortized cost basis exceeds its fair value. The allowance is increased or decreased if credit conditions subsequently worsen or improve. Reversals of credit losses are recognized in earnings.

The Company's review for impairment of AFS debt securities generally entails:

- identification and evaluation of impaired investments;
- consideration of evidential matter, including an evaluation of factors or triggers that could cause individual positions to qualify as credit impaired and those that would not support credit impairment; and
- documentation of the results of these analyses, as required under business policies.

The sections below describe the Company's process for identifying expected credit impairments for debt security types that have the most significant unrealized losses as of December 31, 2022.

Agency Mortgage-Backed Securities
Citi records no allowances for credit losses on U.S. government-agency-guaranteed mortgage-backed securities, because the Company expects to incur no credit losses in the event of default due to a history of incurring no credit losses and due to the nature of the counterparties.

State and Municipal Securities
The process for estimating credit losses in Citigroup's AFS state and municipal bonds is primarily based on a credit analysis that incorporates third-party credit ratings. Citi monitors the bond issuers and any insurers providing default protection in the form of financial guarantee insurance. The average external credit rating, disregarding any insurance, is Aa2/AA. In the event of an external rating downgrade or other indicator of credit impairment (i.e., based on instrument-specific estimates of cash flows or probability of issuer default), the subject bond is specifically reviewed for adverse changes in the amount or timing of expected contractual principal and interest payments.

For AFS state and municipal bonds with unrealized losses that Citi plans to sell or would more-likely-than-not be required to sell prior to recovery of value, the full impairment is recognized in earnings. For AFS state and municipal bonds where Citi has no intent to sell and it is not more-likely-than-not that the Company will be required to sell, Citi records an allowance for expected credit losses for the amount it expects not to collect, capped at the difference between the bond's amortized cost basis and fair value.

Equity Method Investments
Management assesses equity method investments that have fair values that are less than their respective carrying values for other-than-temporary impairment (OTTI). Fair value is measured as price multiplied by quantity if the investee has publicly listed securities. If the investee is not publicly listed, other methods are used (see Note 25).

For impaired equity method investments that Citi plans to sell prior to recovery of value or would more-likely-than-not be required to sell, with no expectation that the fair value will recover prior to the expected sale date, the full impairment is recognized as OTTI in *Other revenue* regardless of severity and duration. The measurement of the OTTI does not include partial projected recoveries subsequent to the balance sheet date.

For impaired equity method investments that management does not plan to sell and is not more-likely-than-not to be required to sell prior to recovery of value, the evaluation of whether an impairment is other-than-temporary is based on (i) whether and when an equity method investment will recover in value and (ii) whether the investor has the intent and ability to hold that investment for a period of time sufficient to recover the value. The determination of whether the impairment is considered other-than-temporary considers the following indicators:

- the cause of the impairment and the financial condition and near-term prospects of the issuer, including any specific events that may influence the operations of the issuer;
- the intent and ability to hold the investment for a period of time sufficient to allow for any anticipated recovery in market value; and
- the length of time and extent to which fair value has been less than the carrying value.

Recognition and Measurement of Impairment

The following table presents total impairment on AFS investments recognized in earnings:

	Year ended		
In millions of dollars	**2022**	2021	2020
Impairment losses related to debt securities that the Company does not intend to sell nor will likely be required to sell:			
Total impairment losses recognized during the period	$ —	$ —	$ —
Less: portion of impairment loss recognized in *AOCI* (before taxes)	—	—	—
Net impairment losses recognized in earnings for debt securities that the Company does not intend to sell nor will likely be required to sell	$ —	$ —	$ —
Impairment losses recognized in earnings for debt securities that the Company intends to sell, would more-likely-than-not be required to sell or will be subject to an issuer call deemed probable of exercise	**360**	181	109
Total impairment losses recognized in earnings	$ **360**	$ 181	$ 109

The following presents the credit-related impairments recognized in earnings for AFS securities held that the Company does not intend to sell nor will likely be required to sell at December 31, 2022 and 2021:

Allowance for Credit Losses on AFS Debt Securities

	Year ended December 31, 2022					
In millions of dollars	**Mortgage-backed**	**U.S. Treasury and federal agency**	**State and municipal**	**Foreign government**	**Corporate**	**Total AFS**
Allowance for credit losses at beginning of year	$ —	$ —	$ —	$ —	$ 8	$ 8
Gross write-offs	—	—	—	—	—	—
Gross recoveries	—	—	—	—	5	5
Net credit losses (NCLs)	$ —	$ —	$ —	$ —	$ 5	$ 5
NCLs	$ —	$ —	$ —	$ —	$ (5)	$ (5)
Credit losses on securities without previous credit losses	—	—	—	—	2	2
Net reserve builds (releases) on securities with previous credit losses	—	—	—	—	(2)	(2)
Total provision for credit losses	$ —	$ —	$ —	$ —	$ (5)	$ (5)
Initial allowance on newly purchased credit-deteriorated securities during the year	—	—	—	—	—	—
Allowance for credit losses at end of year	$ —	$ —	$ —	$ —	$ 3	$ 3

	Year ended December 31, 2021					
In millions of dollars	Mortgage-backed	U.S. Treasury and federal agency	State and municipal	Foreign government	Corporate	Total AFS
Allowance for credit losses at beginning of year	$ —	$ —	$ —	$ —	$ 5	$ 5
Gross write-offs	—	—	—	—	—	—
Gross recoveries	—	—	—	—	—	—
Net credit losses (NCLs)	$ —	$ —	$ —	$ —	$ —	$ —
NCLs	$ —	$ —	$ —	$ —	$ —	$ —
Credit losses on securities without previous credit losses	—	—	—	—	3	3
Net reserve builds (releases) on securities with previous credit losses	—	—	—	—	—	—
Total provision for credit losses	$ —	$ —	$ —	$ —	$ 3	$ 3
Initial allowance on newly purchased credit-deteriorated securities during the year	—	—	—	—	—	—
Allowance for credit losses at end of year	$ —	$ —	$ —	$ —	$ 8	$ 8

In millions of dollars	Year ended December 31, 2020					
	Mortgage-backed	U.S. Treasury and federal agency	State and municipal	Foreign government	Corporate	Total AFS
Allowance for credit losses at beginning of year	$ —	$ —	$ —	$ —	$ —	$ —
Gross write-offs	—	—	—	—	—	—
Gross recoveries	—	—	—	—	2	2
Net credit losses (NCLs)	$ —	$ —	$ —	$ —	$ 2	$ 2
NCLs	$ —	$ —	$ —	$ —	$ (2)	$ (2)
Credit losses on securities without previous credit losses	—	—	—	3	5	8
Net reserve builds (releases) on securities with previous credit losses	—	—	—	(3)	—	(3)
Total provision for credit losses	$ —	$ —	$ —	$ —	$ 3	$ 3
Initial allowance on newly purchased credit-deteriorated securities during the year	—	—	—	—	—	—
Allowance for credit losses at end of year	$ —	$ —	$ —	$ —	$ 5	$ 5

Non-Marketable Equity Securities Not Carried at Fair Value

Non-marketable equity securities are required to be measured at fair value with changes in fair value recognized in earnings unless (i) the measurement alternative is elected or (ii) the investment represents Federal Reserve Bank and Federal Home Loan Bank stock or certain exchange seats that continue to be carried at cost.

The election to measure a non-marketable equity security using the measurement alternative is made on an instrument-by-instrument basis. Under the measurement alternative, an equity security is carried at cost plus or minus changes resulting from observable prices in orderly transactions for the identical or a similar investment of the same issuer. The carrying value of the equity security is adjusted to fair value on the date of an observed transaction. Fair value may differ from the observed transaction price due to a number of factors, including marketability adjustments and differences in rights and obligations when the observed transaction is not for the identical investment held by Citi.

Equity securities under the measurement alternative are also assessed for impairment. On a quarterly basis, management qualitatively assesses whether each equity security under the measurement alternative is impaired. Impairment indicators that are considered include, but are not limited to, the following:

- a significant deterioration in the earnings performance, credit rating, asset quality or business prospects of the investee;
- a significant adverse change in the regulatory, economic or technological environment of the investee;
- a significant adverse change in the general market condition of either the geographical area or the industry in which the investee operates;
- a bona fide offer to purchase, an offer by the investee to sell or a completed auction process for the same or similar investment for an amount less than the carrying amount of that investment; and
- factors that raise significant concerns about the investee's ability to continue as a going concern, such as negative cash flows from operations, working capital deficiencies or noncompliance with statutory capital requirements or debt covenants.

When the qualitative assessment indicates that impairment exists, the investment is written down to fair value, with the full difference between the fair value of the investment and its carrying amount recognized in earnings.

Below is the carrying value of non-marketable equity securities measured using the measurement alternative at December 31, 2022 and 2021:

In millions of dollars	December 31, 2022	December 31, 2021
Measurement alternative:		
Carrying value	$ 1,676	$ 1,413

Below are amounts recognized in earnings and life-to-date amounts for non-marketable equity securities measured using the measurement alternative:

	Years ended December 31,	
In millions of dollars	2022	2021
Measurement alternative[1]:		
Impairment losses	$ 139	$ 25
Downward changes for observable prices	3	—
Upward changes for observable prices	177	406

(1) See Note 25 for additional information on these nonrecurring fair value measurements.

	Life-to-date amounts on securities still held
In millions of dollars	December 31, 2022
Measurement alternative:	
Impairment losses	$ 219
Downward changes for observable prices	6
Upward changes for observable prices	867

A similar impairment analysis is performed for non-marketable equity securities carried at cost. For the years ended December 31, 2022 and 2021, there was no impairment loss recognized in earnings for non-marketable equity securities carried at cost.

14. LOANS

Citigroup loans are reported in two categories: corporate and consumer. These categories are classified primarily according to the operating segment and component that manage the loans in addition to the nature of the obligor, with corporate loans generally made for corporate institutional and public sector clients around the world and consumer loans to retail and small business customers.

Corporate Loans

Corporate loans represent loans and leases managed by *ICG* and the Mexico SBMM component of *Legacy Franchises*. The following table presents information by corporate loan type:

In millions of dollars	December 31, 2022	December 31, 2021
In North America offices[1]		
Commercial and industrial	$ 56,176	$ 48,364
Financial institutions	43,399	49,804
Mortgage and real estate[2]	17,829	15,965
Installment and other	23,767	20,143
Lease financing	308	415
Total	$ 141,479	$ 134,691
In offices outside North America[1]		
Commercial and industrial	$ 93,967	$ 102,735
Financial institutions	21,931	22,158
Mortgage and real estate[2]	4,179	4,374
Installment and other	23,347	22,812
Lease financing	46	40
Governments and official institutions	4,205	4,423
Total	$ 147,675	$ 156,542
Corporate loans, net of unearned income[3][4][5]	$ 289,154	$ 291,233

(1) North America includes the U.S., Canada and Puerto Rico. Mexico is included in offices outside North America. The classification between offices in North America and outside North America is based on the domicile of the booking unit. The difference between the domicile of the booking unit and the domicile of the managing unit is not material.

(2) Loans secured primarily by real estate.

(3) Corporate loans are net of unearned income of $($797) million and ($770) million at December 31, 2022 and 2021, respectively. Unearned income on corporate loans primarily represents interest received in advance, but not yet earned, on loans originated on a discounted basis.

(4) Not included in the balances above is approximately $2 billion of accrued interest receivable at December 31, 2022, which is included in *Other assets* on the Consolidated Balance Sheet.

(5) Accrued interest receivable considered to be uncollectible is reversed through interest income. Amounts reversed were not material for the years ended December 31, 2022 and 2021, respectively.

The Company sold and/or reclassified to held-for-sale $5.0 billion and $5.9 billion of corporate loans during the years ended December 31, 2022 and 2021, respectively. The Company did not have significant purchases of corporate loans classified as held-for-investment for the years ended December 31, 2022 or 2021.

Lease financing

Citi is a lessor in the power, railcars, shipping and aircraft sectors, where the Company has executed operating, direct financing and leveraged leases. Citi's $0.4 billion of lease financing receivables, as of December 31, 2022, is composed of approximately equal balances of direct financing lease receivables and net investments in leveraged leases. Citi uses the interest rate implicit in the lease to determine the present value of its lease financing receivables. Interest income on direct financing and leveraged leases during the year ended December 31, 2022 was not material.

The Company's operating leases, where Citi is a lessor, are not significant to the Consolidated Financial Statements.

Delinquency Status

Citi generally does not manage corporate loans on a delinquency basis. Corporate loans are placed on a cash (non-accrual) basis when it is determined, based on actual experience and a forward-looking assessment of the collectability of the loan in full, that the payment of interest or principal is doubtful or when interest or principal is 90 days past due, except when the loan is well collateralized and in the process of collection. Any interest accrued on impaired corporate loans and leases is reversed at 90 days and charged against current earnings, and interest is thereafter included in earnings only to the extent actually received in cash. When there is doubt regarding the ultimate collectibility of principal, all cash receipts are thereafter applied to reduce the recorded investment in the loan. While corporate loans are generally managed based on their internally assigned risk rating (see further discussion below), the following tables present delinquency information by corporate loan type.

Corporate Loan Delinquencies and Non-Accrual Details at December 31, 2022

In millions of dollars	30–89 days past due and accruing[1]	≥ 90 days past due and accruing[1]	Total past due and accruing	Total non-accrual[2]	Total current[3]	Total loans[4]
Commercial and industrial	$ 763	$ 594	$ 1,357	$ 860	$ 145,586	$ 147,803
Financial institutions	233	102	335	152	64,420	64,907
Mortgage and real estate	30	12	42	33	21,874	21,949
Lease financing	—	1	1	10	343	354
Other	145	18	163	67	48,788	49,018
Loans at fair value						5,123
Total	$ 1,171	$ 727	$ 1,898	$ 1,122	$ 281,011	$ 289,154

Corporate Loan Delinquencies and Non-Accrual Details at December 31, 2021

In millions of dollars	30–89 days past due and accruing[1]	≥ 90 days past due and accruing[1]	Total past due and accruing	Total non-accrual[2]	Total current[3]	Total loans[4]
Commercial and industrial	$ 1,072	$ 239	$ 1,311	$ 1,263	$ 144,430	$ 147,004
Financial institutions	320	166	486	2	71,279	71,767
Mortgage and real estate	1	1	2	136	20,153	20,291
Lease financing	—	—	—	14	441	455
Other	77	19	96	138	45,412	45,646
Loans at fair value						6,070
Total	$ 1,470	$ 425	$ 1,895	$ 1,553	$ 281,715	$ 291,233

(1) Corporate loans that are 90 days past due are generally classified as non-accrual. Corporate loans are considered past due when principal or interest is contractually due but unpaid.

(2) Non-accrual loans generally include those loans that are 90 days or more past due or those loans for which Citi believes, based on actual experience and a forward-looking assessment of the collectability of the loan in full, that the payment of interest and/or principal is doubtful.

(3) Loans less than 30 days past due are presented as current.

(4) The Total loans column includes loans at fair value, which are not included in the various delinquency columns, and therefore the tables' total rows will not cross-foot.

Citigroup has a risk management process to monitor, evaluate and manage the principal risks associated with its corporate loan portfolio. As part of its risk management process, Citi assigns numeric risk ratings to its corporate loan facilities based on quantitative and qualitative assessments of the obligor and facility. These risk ratings are reviewed at least annually or more often if material events related to the obligor or facility warrant. Factors considered in assigning the risk ratings include financial condition of the obligor, qualitative assessment of management and strategy, amount and sources of repayment, amount and type of collateral and guarantee arrangements, amount and type of any contingencies associated with the obligor and the obligor's industry and geography.

The obligor risk ratings are defined by ranges of default probabilities. The facility risk ratings are defined by ranges of loss norms, which are the product of the probability of default and the loss given default. The investment-grade rating categories are similar to the category BBB-/Baa3 and above as defined by S&P and Moody's. Loans classified according to the bank regulatory definitions as special mention, substandard, doubtful and loss will have risk ratings within the non-investment-grade categories.

Corporate Loans Credit Quality Indicators

	Recorded investment in loans[1]							
	Term loans by year of origination							
In millions of dollars	2022	2021	2020	2019	2018	Prior	Revolving line of credit arrangements[2]	December 31, 2022
Investment grade[3]								
Commercial and industrial[4]	$ 50,086	$ 5,716	$ 2,454	$ 2,348	$ 1,129	$ 1,776	$ 38,359	$ 101,868
Financial institutions[4]	13,547	3,174	813	593	284	713	37,463	56,587
Mortgage and real estate	7,321	3,876	3,379	1,205	577	775	152	17,285
Other[5]	12,257	1,171	494	148	688	3,496	26,807	45,061
Total investment grade	$ 83,211	$ 13,937	$ 7,140	$ 4,294	$ 2,678	$ 6,760	$ 102,781	$ 220,801
Non-investment grade[3]								
Accrual								
Commercial and industrial[4]	$ 21,877	$ 3,114	$ 1,371	$ 800	$ 661	$ 402	$ 16,850	$ 45,075
Financial institutions[4]	5,110	626	247	65	36	11	2,073	8,168
Mortgage and real estate	1,081	989	470	556	562	501	472	4,631
Other[5]	1,938	360	466	107	7	64	1,292	4,234
Non-accrual								
Commercial and industrial[4]	80	31	90	53	44	83	479	860
Financial institutions	41	35	—	—	—	—	76	152
Mortgage and real estate	2	11	—	—	2	18	—	33
Other[5]	7	26	1	8	10	9	16	77
Total non-investment grade	$ 30,136	$ 5,192	$ 2,645	$ 1,589	$ 1,322	$ 1,088	$ 21,258	$ 63,230
Loans at fair value[6]								$ 5,123
Corporate loans, net of unearned income	$ 113,347	$ 19,129	$ 9,785	$ 5,883	$ 4,000	$ 7,848	$ 124,039	$ 289,154

	Recorded investment in loans[1]							
	Term loans by year of origination							
In millions of dollars	2021	2020	2019	2018	2017	Prior	Revolving line of credit arrangements[2]	December 31, 2021
Investment grade[3]								
Commercial and industrial[4]	$ 42,422	$ 5,529	$ 4,642	$ 3,757	$ 2,911	$ 8,392	$ 30,588	$ 98,241
Financial institutions[4]	12,862	1,678	1,183	1,038	419	1,354	43,630	62,164
Mortgage and real estate	2,423	3,660	3,332	2,015	1,212	1,288	141	14,071
Other[5]	9,037	3,099	1,160	2,789	330	4,601	18,727	39,743
Total investment grade	$ 66,744	$ 13,966	$ 10,317	$ 9,599	$ 4,872	$ 15,635	$ 93,086	$ 214,219
Non-investment grade[3]								
Accrual								
Commercial and industrial[4]	$ 16,783	$ 2,281	$ 2,343	$ 2,024	$ 1,412	$ 3,981	$ 18,676	$ 47,500
Financial institutions[4]	4,325	347	567	101	71	511	3,679	9,601
Mortgage and real estate	1,275	869	1,228	1,018	493	586	615	6,084
Other[5]	1,339	349	554	364	119	245	3,236	6,206
Non-accrual								
Commercial and industrial[4]	53	119	64	104	94	117	712	1,263
Financial institutions	—	—	—	—	—	—	2	2
Mortgage and real estate	11	8	2	49	10	25	31	136
Other[5]	19	5	19	19	—	90	—	152
Total non-investment grade	$ 23,805	$ 3,978	$ 4,777	$ 3,679	$ 2,199	$ 5,555	$ 26,951	$ 70,944
Loans at fair value[6]								6,070
Corporate loans, net of unearned income	$ 90,549	$ 17,944	$ 15,094	$ 13,278	$ 7,071	$ 21,190	$ 120,037	$ 291,233

(1) Recorded investment in a loan includes net deferred loan fees and costs, unamortized premium or discount, less any direct write-downs.
(2) There were no significant revolving line of credit arrangements that converted to term loans during the year.
(3) Held-for-investment loans are accounted for on an amortized cost basis.
(4) Includes certain short-term loans with less than one year in tenor.
(5) Other includes installment and other, lease financing and loans to government and official institutions.
(6) Loans at fair value include loans to commercial and industrial, financial institutions, mortgage and real estate and other.

Collateral-dependent loans and leases, where repayment is expected to be provided solely by the sale of the underlying collateral with no other available and reliable sources of repayment, are written down to the lower of carrying value or collateral value, less cost to sell. Cash-basis loans are returned to an accrual status when all contractual principal and interest amounts are reasonably assured of repayment and there is a sustained period of repayment performance, generally six months, in accordance with the contractual terms of the loan.

Non-Accrual Corporate Loans

The following tables present non-accrual loan information by corporate loan type and interest income recognized on non-accrual corporate loans:

In millions of dollars	At and for the year ended December 31, 2022				
	Recorded investment[1]	**Unpaid principal balance**	**Related specific allowance**	**Average carrying value[2]**	**Interest income recognized[3]**
Non-accrual corporate loans					
Commercial and industrial	**$ 860**	**$ 1,440**	**$ 268**	**$ 1,210**	**$ 56**
Financial institutions	**152**	**205**	**51**	**115**	**—**
Mortgage and real estate	**33**	**33**	**4**	**85**	**4**
Lease financing	**10**	**10**	**—**	**12**	**—**
Other	**67**	**89**	**—**	**111**	**6**
Total non-accrual corporate loans	**$ 1,122**	**$ 1,777**	**$ 323**	**$ 1,533**	**$ 66**

In millions of dollars	At and for the year ended December 31, 2021				
	Recorded investment[1]	Unpaid principal balance	Related specific allowance	Average carrying value[2]	Interest income recognized[3]
Non-accrual corporate loans					
Commercial and industrial	$ 1,263	$ 1,858	$ 198	$ 1,839	$ 37
Financial institutions	2	55	—	4	—
Mortgage and real estate	136	285	10	163	—
Lease financing	14	14	—	21	—
Other	138	165	4	134	17
Total non-accrual corporate loans	$ 1,553	$ 2,377	$ 212	$ 2,161	$ 54

In millions of dollars	**December 31, 2022**		December 31, 2021	
	Recorded investment[1]	**Related specific allowance**	Recorded investment[1]	Related specific allowance
Non-accrual corporate loans with specific allowances				
Commercial and industrial	**$ 583**	**$ 268**	$ 637	$ 198
Financial institutions	**149**	**51**	—	—
Mortgage and real estate	**33**	**4**	29	10
Other	**—**	**—**	37	4
Total non-accrual corporate loans with specific allowances	**$ 765**	**$ 323**	$ 703	$ 212
Non-accrual corporate loans without specific allowances				
Commercial and industrial	**$ 277**		$ 626	
Financial institutions	**3**		2	
Mortgage and real estate	**—**		107	
Lease financing	**10**		14	
Other	**67**		101	
Total non-accrual corporate loans without specific allowances	**$ 357**	**N/A**	$ 850	N/A

(1) Recorded investment in a loan includes net deferred loan fees and costs, unamortized premium or discount, less any direct write-downs.
(2) Average carrying value represents the average recorded investment balance and does not include related specific allowances.
(3) Interest income recognized for the year ended December 31, 2020 was $35 million.
N/A Not applicable

Corporate Troubled Debt Restructurings

For the year ended December 31, 2022

In millions of dollars	Carrying value of TDRs modified during the year	TDRs involving changes in the amount and/or timing of principal payments[2]	TDRs involving changes in the amount and/or timing of interest payments[3]	TDRs involving changes in the amount and/or timing of both principal and interest payments
Commercial and industrial	$ 61	$ —	$ —	$ 61
Mortgage and real estate	2	1	—	1
Other	30	—		30
Total	$ 93	$ 1	$ —	$ 92

For the year ended December 31, 2021[1]

In millions of dollars	Carrying value of TDRs modified during the year	TDRs involving changes in the amount and/or timing of principal payments[2]	TDRs involving changes in the amount and/or timing of interest payments[3]	TDRs involving changes in the amount and/or timing of both principal and interest payments
Commercial and industrial	$ 82	$ —	$ —	$ 82
Mortgage and real estate	4	—	—	4
Other	6	—		6
Total	$ 92	$ —	$ —	$ 92

(1) The 2021 table does not include loan modifications that meet the TDR relief criteria in the CARES Act or the interagency guidance.
(2) TDRs involving changes in the amount or timing of principal payments may involve principal forgiveness or deferral of periodic and/or final principal payments. Because forgiveness of principal is rare for corporate loans, modifications typically have little to no impact on the loans' projected cash flows and thus little to no impact on the allowance established for the loans. Charge-offs for amounts deemed uncollectible may be recorded at the time of the restructuring or may have already been recorded in prior periods such that no charge-off is required at the time of the modification.
(3) TDRs involving changes in the amount or timing of interest payments may involve a below-market interest rate.

The following table presents total corporate loans modified in a TDR as well as those TDRs that defaulted and for which the payment default occurred within one year of a permanent modification. Default is defined as 60 days past due, except for classifiably managed commercial banking loans, where default is defined as 90 days past due.

In millions of dollars	TDR balances at December 31, 2022	TDR loans that re-defaulted in 2022 within one year of modification	TDR balances at December 31, 2021	TDR loans that re-defaulted in 2020 within one year of modification
Commercial and industrial	$ 85	$ —	$ 236	$ —
Mortgage and real estate	13	—	20	—
Other	12	—	28	—
Total[1]	$ 110	$ —	$ 284	$ —

(1) The above table reflects activity for loans outstanding that were considered TDRs as of the end of the reporting period.

Consumer Loans

Consumer loans represent loans and leases managed primarily by *PBWM* and *Legacy Franchises* (except Mexico SBMM).

Citigroup has established a risk management process to monitor, evaluate and manage the principal risks associated with its consumer loan portfolio. Credit quality indicators that are actively monitored include delinquency status, consumer credit scores under Fair Isaac Corporation (FICO) and loan to value (LTV) ratios, each as discussed in more detail below.

Delinquency Status

Delinquency status is monitored and considered a key indicator of credit quality of consumer loans. Principally, the U.S. residential first mortgage loans use the Mortgage Bankers Association (MBA) method of reporting delinquencies, which considers a loan delinquent if a monthly payment has not been received by the end of the day immediately preceding the loan's next due date. All other loans use a method of reporting delinquencies that considers a loan delinquent if a monthly payment has not been received by the close of business on the loan's next due date.

As a general policy, residential first mortgages, home equity loans and installment loans are classified as non-accrual when loan payments are 90 days contractually past due. Credit cards and unsecured revolving loans generally accrue interest until payments are 180 days past due. Home equity loans in regulated bank entities are classified as non-accrual if the related residential first mortgage is 90 days or more past due. Mortgage loans, other than Federal Housing Administration (FHA)-insured loans, are classified as non-accrual within 60 days of notification that the borrower has filed for bankruptcy.

The policy for re-aging modified U.S. consumer loans to current status varies by product. Generally, one of the conditions to qualify for these modifications is that a minimum number of payments (typically ranging from one to three) be made. Upon modification, the loan is re-aged to current status. However, re-aging practices for certain open-ended consumer loans, such as credit cards, are governed by Federal Financial Institutions Examination Council (FFIEC) guidelines. For open-ended consumer loans subject to FFIEC guidelines, one of the conditions for a loan to be re-aged to current status is that at least three consecutive minimum monthly payments, or the equivalent amount, must be received. In addition, under FFIEC guidelines, the number of times that such a loan can be re-aged is subject to limitations (generally once in 12 months and twice in five years).

Furthermore, FHA and Department of Veterans Affairs (VA) loans are modified under those respective agencies' guidelines and payments are not always required in order to re-age a modified loan to current.

The tables below present details about these loans, including the following loan categories:

- Residential first mortgages and Home equity loans in North America offices primarily represent secured mortgage lending to customers of Retail banking and Global Wealth (primarily Private bank and Citigold).
- Credit cards in North America offices primarily represent unsecured credit card lending to customers of Branded cards and Retail services.
- Personal, small business and other loans in North America are primarily composed of classifiably managed loans to customers of Global Wealth (mostly within the Private bank) who are typically high credit quality borrowers that historically experienced minimal delinquencies and credit losses. Loans to these borrowers are generally well collateralized in the form of liquid securities and other forms of collateral.
- Residential mortgage loans in offices outside North America primarily represent secured mortgage lending to customers of Global Wealth (primarily Private bank and Citigold) as well as customers of *Legacy Franchises*.
- Credit cards in offices outside North America primarily represent unsecured credit card lending to customers of *Legacy Franchises*, primarily in Asia and Mexico.
- Personal, small business and other loans in offices outside North America are primarily composed of secured and unsecured loans to customers of *PBWM* and *Legacy Franchises*. A significant portion of *PBWM* loans is classifiably managed and represents loans to high credit quality Private bank customers who historically experienced minimal delinquencies and credit losses. Loans to these borrowers are generally well collateralized in the form of liquid securities and other forms of collateral.

The following tables provide Citi's consumer loans by type:

Consumer Loans, Delinquencies and Non-Accrual Status at December 31, 2022

In millions of dollars	Total current[1][2]	30–89 days past due[3]	≥ 90 days past due[3]	Past due government guaranteed[6]	Total loans	Non-accrual loans for which there is no ACLL	Non-accrual loans for which there is an ACLL	Total non-accrual	90 days past due and accruing
In North America offices[7]									
Residential first mortgages[8]	$ 95,023	$ 421	$ 316	$ 279	$ 96,039	$ 86	$ 434	$ 520	$ 163
Home equity loans[9][10]	4,407	38	135	—	4,580	51	151	202	—
Credit cards	147,717	1,511	1,415	—	150,643	—	—	—	1,415
Personal, small business and other[11]	37,635	88	22	7	37,752	3	23	26	11
Total	$ 284,782	$ 2,058	$ 1,888	$ 286	$ 289,014	$ 140	$ 608	$ 748	$ 1,589
In offices outside North America[7]									
Residential mortgages[8]	$ 27,946	$ 62	$ 106	$ —	$ 28,114	$ —	$ 305	$ 305	$ 13
Credit cards	12,659	147	149	—	12,955	—	127	127	56
Personal, small business and other[11]	37,869	105	10	—	37,984	—	137	137	—
Total	$ 78,474	$ 314	$ 265	$ —	$ 79,053	$ —	$ 569	$ 569	$ 69
Total Citigroup[12][13]	$ 363,256	$ 2,372	$ 2,153	$ 286	$ 368,067	$ 140	$ 1,177	$ 1,317	$ 1,658

Consumer Loans, Delinquencies and Non-Accrual Status at December 31, 2021

In millions of dollars	Total current[1][2]	30–89 days past due[3][4][5]	≥ 90 days past due[3][4][5]	Past due government guaranteed[5][6]	Total loans	Non-accrual loans for which there is no ACLL	Non-accrual loans for which there is an ACLL	Total non-accrual	90 days past due and accruing
In North America offices[7]									
Residential first mortgages[8]	$ 82,087	$ 381	$ 499	$ 394	$ 83,361	$ 134	$ 559	$ 693	$ 282
Home equity loans[9][10]	5,546	43	156	—	5,745	64	221	285	—
Credit cards	132,050	947	871	—	133,868	—	—	—	871
Personal, small business and other[14]	40,533	126	16	38	40,713	2	70	72	30
Total	$ 260,216	$ 1,497	$ 1,542	$ 432	$ 263,687	$ 200	$ 850	$ 1,050	$ 1,183
In offices outside North America[7]									
Residential mortgages[8]	$ 37,566	$ 165	$ 158	$ —	$ 37,889	$ —	$ 409	$ 409	$ 10
Credit cards	17,428	192	188	—	17,808	—	140	140	133
Personal, small business and other[14]	56,930	145	75	—	57,150	—	227	227	—
Total	$ 111,924	$ 502	$ 421	$ —	$ 112,847	$ —	$ 776	$ 776	$ 143
Total Citigroup[13]	$ 372,140	$ 1,999	$ 1,963	$ 432	$ 376,534	$ 200	$ 1,626	$ 1,826	$ 1,326

(1) Loans less than 30 days past due are presented as current.
(2) Includes $237 million and $12 million at December 31, 2022 and 2021, respectively, of residential first mortgages recorded at fair value.
(3) Excludes loans guaranteed by U.S. government-sponsored agencies. Excludes $31.5 billion and $17.8 billion of classifiably managed Private bank loans in North America and outside North America, respectively, at December 31, 2022. Excludes $35.3 billion and $24.5 billion of classifiably managed Private bank loans in North America and outside North America, respectively, at December 31, 2021.
(4) Loans modified under Citi's consumer relief programs continue to be reported in the same delinquency bucket they were in at the time of modification. Most modified loans in North America would not be reported as 30–89 or 90+ days past due for the duration of the programs (which have various durations, and certain of which may be renewed).
(5) Conformed to be consistent with the current period's delineation between delinquency-managed and classifiably managed loans.
(6) Consists of loans that are guaranteed by U.S. government-sponsored agencies that are 30–89 days past due of $0.1 billion and $0.1 billion and 90 days or more past due of $0.2 billion and $0.3 billion at December 31, 2022 and 2021, respectively.
(7) North America includes the U.S., Canada and Puerto Rico. Mexico is included in offices outside North America.
(8) Includes approximately $0.1 billion and $0.0 billion of residential first mortgage loans in process of foreclosure in North America and outside North America, respectively, and $19.8 billion of residential mortgages outside North America related to the Global Wealth business at December 31, 2022. Includes

approximately $0.1 billion and $0.1 billion of residential first mortgage loans in process of foreclosure in North America and outside North America, respectively, and $19.8 billion of residential mortgages outside North America related to the Global Wealth business at December 31, 2021.

(9) Includes approximately $0.1 billion and $0.1 billion at December 31, 2022 and 2021, respectively, of home equity loans in process of foreclosure in North America.

(10) Fixed-rate home equity loans and loans extended under home equity lines of credit, which are typically in junior lien positions.

(11) Includes loans related to the Global Wealth business: $34.0 billion in North America, approximately $31.5 billion of which are classifiably managed, and as of December 31, 2022 approximately 98% were rated investment grade; and $26.6 billion outside North America, approximately $17.8 billion of which are classifiably managed, and as of December 31, 2022 approximately 94% were rated investment grade. The classifiably managed portion of these loans is shown as "current" because the delinquency status is not applicable, since these loans are primarily evaluated for credit risk based on their internal risk classification.

(12) Not included in the balances above is approximately $1 billion of accrued interest receivable at December 31, 2022, which is included in *Other assets* on the Consolidated Balance Sheet, except for credit card loans (which include accrued interest and fees). When a loan becomes non-accrual or, if not subject to a non-accrual policy, is charged-off per the Company's charge-off policy, any accrued interest receivable is also reversed against the interest income. During the years ended December 31, 2022 and 2021, the Company reversed accrued interest of approximately $0.6 billion and $0.8 billion, respectively, primarily related to credit card loans.

(13) Consumer loans were net of unearned income of $712 million and $629 million at December 31, 2022 and 2021, respectively. Unearned income on consumer loans primarily represents unamortized origination fees and costs, premiums and discounts.

(14) Includes loans related to the Global Wealth business: $37.9 billion in North America, approximately $35.3 billion of which are classifiably managed, and as of December 31, 2021 approximately 95% were rated investment grade; and $34.6 billion outside North America, approximately $24.5 billion of which are classifiably managed, and as of December 31, 2021 approximately 94% were rated investment grade. The classifiably managed portion of these loans is shown as "current" because the delinquency status is not applicable, since these loans are primarily evaluated for credit risk based on their internal risk classification.

Interest Income Recognized for Non-Accrual Consumer Loans

	For the years ended December 31,	
In millions of dollars	2022	2021
In North America offices[1]		
Residential first mortgages	$ 12	$ 13
Home equity loans	5	7
Credit cards	—	—
Personal, small business and other	2	—
Total	$ 19	$ 20
In offices outside North America[1]		
Residential mortgages	$ 4	$ 1
Credit cards	—	—
Personal, small business and other	4	—
Total	$ 8	$ 1
Total Citigroup	$ 27	$ 21

(1) North America includes the U.S., Canada and Puerto Rico. Mexico is included in offices outside North America.

During the years ended December 31, 2022 and 2021, the Company sold and/or reclassified to HFS $582 million and $1,473 million of consumer loans, respectively. Loans held by a business for sale are not included in the above. The Company did not have significant purchases of consumer loans classified as held-for-investment during the years ended December 31, 2022 and 2021. See Note 2 for additional information regarding Citigroup's businesses for sale.

Consumer Credit Scores (FICO)

In the U.S., independent credit agencies rate an individual's risk for assuming debt based on the individual's credit history and assign every consumer a Fair Isaac Corporation (FICO) credit score. These scores are continually updated by the agencies based upon an individual's credit actions (e.g., taking out a loan or missed or late payments).

The following tables provide details on the FICO scores for Citi's U.S. consumer loan portfolio based on end-of-period receivables by year of origination. FICO scores are updated monthly for substantially all of the portfolio or, otherwise, on a quarterly basis for the remaining portfolio.

For Citi's $80.5 billion and $114.3 billion in the consumer loan portfolio outside of the U.S. as of December 31, 2022 and 2021, respectively, various country-specific or regional credit risk metrics and acquisition and behavior scoring models are leveraged as one of the factors to evaluate the credit quality of customers (for additional information on loans outside of the U.S., see "Consumer Loans and Ratios Outside of North America" below). As a result, details of relevant credit quality indicators for those loans are not comparable to the below FICO score distribution for the U.S. portfolio.

FICO score distribution—U.S. portfolio[1][2]	**December 31, 2022**					
In millions of dollars	**Less than 680**	**680 to 760**	**Greater than 760**	**Classifiably managed[3]**	**FICO not available[4]**	**Total loans**
Residential first mortgages						
2022	$ 691	$ 7,530	$ 12,928			
2021	639	5,933	12,672			
2020	431	4,621	10,936			
2019	321	2,505	5,445			
2018	302	1,072	1,899			
Prior	2,020	6,551	12,649			
Total residential first mortgages	$ 4,404	$ 28,212	$ 56,529		$ 6,894	$ 96,039
Home equity line of credit (pre-reset)	$ 552	$ 1,536	$ 1,876			
Home equity line of credit (post-reset)	62	65	40			
Home equity term loans	106	151	117			
2022	—	—	—			
2021	—	1	1			
2020	1	2	2			
2019	1	2	2			
2018	1	2	1			
Prior	103	144	111			
Total home equity loans	$ 720	$ 1,752	$ 2,033		$ 75	$ 4,580
Credit cards	$ 27,901	$ 58,213	$ 60,896			
Revolving loans converted to term loans[5]	766	354	54			
Total credit cards[6]	$ 28,667	$ 58,567	$ 60,950		$ 1,914	$ 150,098
Personal, small business and other						
2022	$ 247	$ 546	$ 800			
2021	96	170	210			
2020	15	20	30			
2019	21	23	28			
2018	10	10	9			
Prior	126	190	144			
Total personal, small business and other[7][8]	$ 515	$ 959	$ 1,221	$ 31,478	$ 2,639	$ 36,812
Total	$ 34,306	$ 89,490	$ 120,733	$ 31,478	$ 11,522	$ 287,529

FICO score distribution—U.S. portfolio[1][2]	December 31, 2021					
In millions of dollars	Less than 680	680 to 760	Greater than 760	Classifiably managed[3]	FICO not available[4]	Total loans
Residential first mortgages						
2021	$ 626	$ 6,729	$ 12,349			
2020	508	5,102	12,153			
2019	373	3,074	6,167			
2018	394	1,180	2,216			
2017	343	1,455	2,568			
Prior	2,053	6,540	12,586			
Total residential first mortgages	$ 4,297	$ 24,080	$ 48,039		$ 6,945	$ 83,361
Home equity line of credit (pre-reset)	$ 659	$ 1,795	$ 2,506			
Home equity line of credit (post-reset)	75	72	37			
Home equity term loans	168	210	156			
2021	—	1	1			
2020	—	3	2			
2019	1	2	2			
2018	1	2	1			
2017	1	2	2			
Prior	165	201	149			
Total home equity loans	$ 902	$ 2,077	$ 2,699		$ 67	$ 5,745
Credit cards	$ 22,342	$ 52,481	$ 55,076			
Revolving loans converted to term loans[5]	773	426	61			
Total credit cards[6]	$ 23,115	$ 52,907	$ 55,137		$ 2,192	$ 133,351
Personal, small business and other						
2021	$ 59	$ 201	$ 319			
2020	22	41	64			
2019	42	53	68			
2018	34	35	37			
2017	7	8	9			
Prior	120	179	143			
Total personal, small business and other[7][8]	$ 284	$ 517	$ 640	$ 35,324	$ 3,041	$ 39,806
Total	$ 28,598	$ 79,581	$ 106,515	$ 35,324	$ 12,245	$ 262,263

(1) The FICO bands in the tables are consistent with general industry peer presentations.
(2) FICO scores are updated on either a monthly or quarterly basis. For updates that are made only quarterly, certain current-period loans by year of origination are greater than those disclosed in the prior periods. Loans that did not have FICO scores as of the prior period have been updated with FICO scores as they become available.
(3) These personal, small business and other loans without a FICO score available include $31.5 billion and $35.3 billion of Private bank loans as of December 31, 2022 and 2021, respectively, which are classifiably managed within Global Wealth and are primarily evaluated for credit risk based on their internal risk ratings. As of December 31, 2022 and 2021, approximately 98% and 95% of these loans, respectively, were rated investment grade.
(4) FICO scores not available related to loans guaranteed by government-sponsored enterprises for which FICO scores are generally not utilized.
(5) Not included in the tables above are $75 million and $313 million of revolving credit card loans outside of the U.S. that were converted to term loans as of December 31, 2022 and 2021, respectively.
(6) Excludes $545 million and $517 million of balances related to Canada for December 31, 2022 and 2021, respectively.
(7) Excludes $940 million and $907 million of balances related to Canada for December 31, 2022 and 2021, respectively.
(8) Includes approximately $67 million and $74 million of personal revolving loans that were converted to term loans for December 31, 2022 and 2021, respectively.

Loan to Value (LTV) Ratios—U.S. Consumer Mortgages

LTV ratios (loan balance divided by appraised value) are calculated at origination and updated by applying market price data.

The following tables provide details on the LTV ratios for Citi's U.S. consumer mortgage portfolios by year of origination. LTV ratios are updated monthly using the most recent Core Logic Home Price Index data available for substantially all of the portfolio applied at the Metropolitan Statistical Area level, if available, or the state level if not. The remainder of the portfolio is updated in a similar manner using the Federal Housing Finance Agency indices.

LTV distribution—U.S. portfolio	**December 31, 2022**				
In millions of dollars	**Less than or equal to 80%**	**> 80% but less than or equal to 100%**	**Greater than 100%**	**LTV not available[1]**	**Total**
Residential first mortgages					
2022	$ 15,644	$ 6,497	$ 40		
2021	19,104	1,227	33		
2020	16,935	267	1		
2019	8,789	140	23		
2018	3,598	74	9		
Prior	22,367	132	74		
Total residential first mortgages	$ 86,437	$ 8,337	$ 180	$ 1,085	$ 96,039
Home equity loans (pre-reset)	$ 3,677	$ 36	$ 56		
Home equity loans (post-reset)	627	12	27		
Total home equity loans	$ 4,304	$ 48	$ 83	$ 145	$ 4,580
Total	$ 90,741	$ 8,385	$ 263	$ 1,230	$ 100,619

LTV distribution—U.S. portfolio	December 31, 2021				
In millions of dollars	Less than or equal to 80%	> 80% but less than or equal to 100%	Greater than 100%	LTV not available[1]	Total
Residential first mortgages					
2021	$ 18,107	$ 2,723	$ 34		
2020	18,715	446	—		
2019	10,047	269	29		
2018	4,117	136	11		
2017	4,804	103	4		
Prior	22,161	128	14		
Total residential first mortgages	$ 77,951	$ 3,805	$ 92	$ 1,513	$ 83,361
Home equity loans (pre-reset)	$ 2,637	$ 46	$ 69		
Home equity loans (post-reset)	2,751	52	32		
Total home equity loans	$ 5,388	$ 98	$ 101	$ 158	$ 5,745
Total	$ 83,339	$ 3,903	$ 193	$ 1,671	$ 89,106

(1) Residential first mortgages with no LTV information available are primarily due to government-guaranteed loans that do not require LTV information for credit risk assessment and fair value loans.

Loan-to-Value (LTV) Ratios—Outside of U.S. Consumer Mortgages

The following tables provide details on the LTV ratios for Citi's consumer mortgage portfolio outside of the U.S. by year of origination:

LTV distribution—outside of U.S. portfolio[1]	December 31, 2022				
In millions of dollars	Less than or equal to 80%	> 80% but less than or equal to 100%	Greater than 100%	LTV not available	Total
Residential mortgages					
2022	$ 3,106	$ 975	$ 294		
2021	4,144	964	273		
2020	3,293	502	25		
2019	3,048	92	1		
2018	2,074	48	—		
Prior	9,201	36	7		
Total	$ 24,866	$ 2,617	$ 600	$ 31	$ 28,114

LTV distribution—outside of U.S. portfolio[1]	December 31, 2021				
In millions of dollars	Less than or equal to 80%	> 80% but less than or equal to 100%	Greater than 100%	LTV not available	Total
Residential mortgages					
2021	$ 6,334	$ 989	$ —		
2020	5,996	292	—		
2019	5,293	116	1		
2018	3,729	32	—		
2017	2,739	38	—		
Prior	12,190	102	14		
Total	$ 36,281	$ 1,569	$ 15	$ 24	$ 37,889

(1) Mortgage portfolios outside of the U.S. are primarily in Global Wealth. As of December 31, 2022 and 2021, mortgage portfolios outside of the U.S. have an average LTV of approximately 51% and 46%, respectively.

Consumer Loans and Ratios Outside of North America

In millions of dollars at December 31, 2022	Total loans outside of North America[1]	Classifiably managed loans[2]	Delinquency-managed loans and ratios: Delinquency-managed loans	30–89 days past due ratio	≥ 90 days past due ratio	4Q22 NCL ratio
Residential mortgages[3]	$ 28,114	$ —	$ 28,114	0.22 %	0.38 %	0.10 %
Credit cards	12,955	—	12,955	1.13	1.15	3.18
Personal, small business and other[4]	37,984	17,762	20,222	0.52	0.05	0.76
Total	$ 79,053	$ 17,762	$ 61,291	0.51 %	0.43 %	0.91 %

In millions of dollars at December 31, 2021	Total loans outside of North America[1]	Classifiably managed loans[2]	Delinquency-managed loans and ratios: Delinquency-managed loans	30–89 days past due ratio	≥ 90 days past due ratio	4Q21 NCL ratio
Residential mortgages[3]	$ 37,889	$ —	$ 37,889	0.44 %	0.42 %	0.08 %
Credit cards	17,808	—	17,808	1.08	1.06	3.06
Personal, small business and other[4]	57,150	24,482	32,668	0.44	0.23	0.72
Total	$ 112,847	$ 24,482	$ 88,365	0.57 %	0.48 %	0.88 %

(1) Mexico is included in offices outside of North America.
(2) Classifiably managed loans are primarily evaluated for credit risk based on their internal risk classification. As of December 31, 2022 and 2021, approximately 94% and 94% of these loans, respectively, were rated investment grade.
(3) Includes $19.8 billion and $19.8 billion as of December 31, 2022 and 2021, respectively, of residential mortgages related to the Global Wealth business.
(4) Includes $26.6 billion and $34.6 billion as of December 31, 2022 and 2021, respectively, of loans related to the Global Wealth business.

Impaired Consumer Loans

A loan is considered impaired when Citi believes it is probable that all amounts due according to the original contractual terms of the loan will not be collected. Impaired consumer loans include non-accrual loans, as well as smaller-balance homogeneous loans whose terms have been modified due to the borrower's financial difficulties and where Citi has granted a concession to the borrower. These modifications may include interest rate reductions and/or principal forgiveness. Impaired consumer loans exclude smaller-balance homogeneous loans that have not been modified and are carried on a non-accrual basis.

The following tables present information about impaired consumer loans and interest income recognized on impaired consumer loans:

	At and for the year ended December 31, 2022				
In millions of dollars	**Recorded investment[1][2]**	**Unpaid principal balance**	**Related specific allowance[3]**	**Average carrying value[5]**	**Interest income recognized[6]**
Mortgage and real estate					
Residential first mortgages	**$ 1,305**	**$ 1,430**	**$ 58**	**$ 1,283**	**$ 115**
Home equity loans	**254**	**322**	**—**	**261**	**10**
Credit cards	**1,255**	**1,256**	**491**	**1,246**	**62**
Personal, small business and other	**107**	**108**	**47**	**120**	**18**
Total	**$ 2,921**	**$ 3,116**	**$ 596**	**$ 2,910**	**$ 205**

	At and for the year ended December 31, 2021				
In millions of dollars	Recorded investment[1][2]	Unpaid principal balance	Related specific allowance[3][4]	Average carrying value[5]	Interest income recognized[6]
Mortgage and real estate					
Residential first mortgages	$ 1,521	$ 1,595	$ 87	$ 1,564	$ 88
Home equity loans	191	344	(1)	336	9
Credit cards	1,582	1,609	594	1,795	116
Personal, small business and other	454	461	133	505	52
Total	$ 3,748	$ 4,009	$ 813	$ 4,200	$ 265

(1) Recorded investment in a loan includes net deferred loan fees and costs, unamortized premium or discount and direct write-downs and includes accrued interest only on credit card loans.

(2) For December 31, 2022, $152 million of residential first mortgages and $73 million of home equity loans do not have a specific allowance. For December 31, 2021, $190 million of residential first mortgages and $94 million of home equity loans do not have a specific allowance because they are accounted for based on collateral value, and that value is in excess of the outstanding loan balance.

(3) Included in the *Allowance for credit losses on loans*.

(4) The negative allowance on home equity loans resulted from expected recoveries on previously written-off accounts.

(5) Average carrying value represents the average recorded investment ending balance for the last four quarters and does not include the related specific allowance.

(6) Includes amounts recognized on both an accrual and cash basis.

Consumer Troubled Debt Restructurings

In millions of dollars, except number of loans modified	For the year ended December 31, 2022					
	Number of loans modified	Post-modification recorded investment[2][3]	Deferred principal[4]	Contingent principal forgiveness[5]	Principal forgiveness[6]	Average interest rate reduction
In North America offices[7]						
Residential first mortgages	1,133	$ 263	$ —	$ —	$ —	— %
Home equity loans	451	40	—	—	—	—
Credit cards	176,252	775	—	—	—	18
Personal, small business and other	575	7	—	—	—	5
Total[8]	178,411	$ 1,085	$ —	$ —	$ —	
In offices outside North America[7]						
Residential mortgages	683	$ 21	$ —	$ —	$ —	— %
Credit cards	16,006	68	—	—	1	25
Personal, small business and other	2,432	29	—	—	1	8
Total[8]	19,121	$ 118	$ —	$ —	$ 2	

In millions of dollars, except number of loans modified	For the year ended December 31, 2021[1]					
	Number of loans modified	Post-modification recorded investment[2][9]	Deferred principal[4]	Contingent principal forgiveness[5]	Principal forgiveness[6]	Average interest rate reduction
In North America offices[7]						
Residential first mortgages	1,335	$ 230	$ —	$ —	$ —	1 %
Home equity loans	191	19	—	—	—	—
Credit cards	165,098	794	—	—	—	18
Personal, small business and other	1,000	13	—	—	—	3
Total[8]	167,624	$ 1,056	$ —	$ —	$ —	
In offices outside North America[7]						
Residential mortgages	1,975	$ 86	$ —	$ —	$ —	— %
Credit cards	74,202	339	—	—	13	13
Personal, small business and other	28,208	202	—	—	7	10
Total[8]	104,385	$ 627	$ —	$ —	$ 20	

(1) The 2021 table does not include loan modifications that meet the TDR relief criteria in the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) or the interagency guidance.
(2) Post-modification balances include past-due amounts that are capitalized at the modification date.
(3) Post-modification balances in North America include $5 million of residential first mortgages to borrowers who have gone through Chapter 7 bankruptcy in the year ended December 31, 2022. These amounts include $3.8 million of residential first mortgages that were newly classified as TDRs during 2022, based on previously received OCC guidance. The remaining amounts were already classified as TDRs before being discharged in Chapter 7 bankruptcy.
(4) Represents the portion of contractual loan principal that is non-interest bearing, but still due from the borrower. Such deferred principal is charged off at the time of permanent modification to the extent that the related loan balance exceeds the underlying collateral value.
(5) Represents the portion of contractual loan principal that is non-interest bearing and, depending upon borrower performance, eligible for forgiveness.
(6) Represents the portion of contractual loan principal that was forgiven at the time of permanent modification.
(7) North America includes the U.S., Canada and Puerto Rico. Mexico is included in offices outside North America.
(8) The above tables reflect activity for restructured loans that were considered TDRs during the year.
(9) Post-modification balances in North America include $15 million of residential first mortgages to borrowers who have gone through Chapter 7 bankruptcy in the year ended December 31, 2021. These amounts include $5 million of residential first mortgages that were newly classified as TDRs during 2021, based on previously received OCC guidance. The remaining amounts were already classified as TDRs before being discharged in Chapter 7 bankruptcy.

The following table presents consumer TDRs that defaulted for which the payment default occurred within one year of a permanent modification. Default is defined as 60 days past due:

In millions of dollars	Years ended December 31, 2022	2021
In North America offices[1]		
Residential first mortgages	$ 35	$ 57
Home equity loans	4	8
Credit cards	250	252
Personal, small business and other	1	4
Total	$ 290	$ 321
In offices outside North America[1]		
Residential mortgages	$ 10	$ 38
Credit cards	12	152
Personal, small business and other	3	96
Total	$ 25	$ 286

(1) North America includes the U.S., Canada and Puerto Rico. Mexico is included in offices outside North America.

Purchased Credit-Deteriorated Assets

	Years ended December 31,					
	2022			2021		
In millions of dollars	Credit cards	Mortgages[1]	Installment and other	Credit cards	Mortgages[1]	Installment and other
Purchase price	$ —	$ 23	$ —	$ —	$ 23	$ —
Allowance for credit losses at acquisition date	—	—	—	—	—	—
Discount or premium attributable to non-credit factors	—	—	—	—	—	—
Par value (amortized cost basis)	$ —	$ 23	$ —	$ —	$ 23	$ —

(1) Includes loans sold to agencies that were bought back at par due to repurchase agreements.

15. ALLOWANCE FOR CREDIT LOSSES

In millions of dollars	2022	2021	2020
Allowance for credit losses on loans (ACLL) at beginning of year	$ **16,455**	$ 24,956	$ 12,783
Adjustments to opening balance[1]:			
Financial instruments—credit losses (CECL) adoption	**—**	—	4,201
Variable post-charge-off third-party collection costs	**—**	—	(443)
Adjusted ACLL at beginning of year	$ **16,455**	$ 24,956	$ 16,541
Gross credit losses on loans	$ **(5,156)**	$ (6,720)	$ (9,263)
Gross recoveries on loans	**1,367**	1,825	1,652
Net credit losses on loans (NCLs)	$ **(3,789)**	$ (4,895)	$ (7,611)
Replenishment of NCLs	$ **3,789**	$ 4,895	$ 7,611
Net reserve builds (releases) for loans	**937**	(7,283)	7,635
Net specific reserve builds (releases) for loans	**19**	(715)	676
Total provision for credit losses on loans (PCLL)	$ **4,745**	$ (3,103)	$ 15,922
Initial allowance for credit losses on newly purchased credit-deteriorated assets during the period	**—**	—	4
Other, net (see table below)	**(437)**	(503)	100
ACLL at end of year	$ **16,974**	$ 16,455	$ 24,956
Allowance for credit losses on unfunded lending commitments (ACLUC) at beginning of year[2]	$ **1,871**	$ 2,655	$ 1,456
Adjustment to opening balance for CECL adoption[1]	**—**	—	(194)
Provision (release) for credit losses on unfunded lending commitments	**291**	(788)	1,446
Other, net[3]	**(11)**	4	(53)
ACLUC at end of year[2]	$ **2,151**	$ 1,871	$ 2,655
Total allowance for credit losses on loans, leases and unfunded lending commitments	$ **19,125**	$ 18,326	$ 27,611

Other, net details

In millions of dollars	2022	2021	2020
Sales or transfers of various consumer loan portfolios to HFS[4]			
Reclass of Thailand, India, Malaysia, Taiwan, Indonesia, Bahrain and Vietnam consumer ACLL to HFS	$ **(350)**	$ —	$ —
Reclass of Australia consumer ACLL to HFS	**—**	(280)	—
Reclass of the Philippines consumer ACLL to HFS	**—**	(90)	—
Transfer of real estate loan portfolios	**—**	—	(4)
Reclasses of consumer ACLL to HFS[4]	$ **(350)**	$ (370)	$ (4)
FX translation and other	**(87)**	(133)	104
Other, net	$ **(437)**	$ (503)	$ 100

(1) See "Accounting Changes" in Note 1.
(2) Represents additional credit loss reserves for unfunded lending commitments and letters of credit recorded in *Other liabilities* on the Consolidated Balance Sheet.
(3) See below for ACL on *HTM debt securities* and *Other assets*. 2020 includes a non-provision transfer of $68 million, representing reserves on performance guarantees. The reserves on these contracts have been reclassified out of the allowance for credit losses on unfunded lending commitments and into *Other liabilities* on the Consolidated Balance Sheet beginning in 2020.
(4) See Note 2.

Allowance for Credit Losses on Loans and End-of-Period Loans at December 31, 2022

In millions of dollars	Corporate	Consumer	Total
ACLL at beginning of year	$ 2,415	$ 14,040	$ 16,455
Gross credit losses on loans	(278)	(4,878)	(5,156)
Gross recoveries on loans	100	1,267	1,367
Replenishment of NCLs	178	3,611	3,789
Net reserve builds (releases)	374	563	937
Net specific reserve builds (releases)	65	(46)	19
Initial allowance for credit losses on newly purchased credit-deteriorated assets during the year	—	—	—
Other	1	(438)	(437)
Ending balance	$ 2,855	$ 14,119	$ 16,974
ACLL			
Collectively evaluated	$ 2,532	$ 13,521	$ 16,053
Individually evaluated	323	596	919
Purchased credit deteriorated	—	2	2
Total ACLL	$ 2,855	$ 14,119	$ 16,974
Loans, net of unearned income			
Collectively evaluated	$ 282,909	$ 364,795	$ 647,704
Individually evaluated	1,122	2,921	4,043
Purchased credit deteriorated	—	114	114
Held at fair value	5,123	237	5,360
Total loans, net of unearned income	$ 289,154	$ 368,067	$ 657,221

2022 Changes in the ACL

The total allowance for credit losses on loans, leases and unfunded lending commitments as of December 31, 2022 was $19,125 million, an increase from $18,326 million at December 31, 2021. The increase in the allowance for credit losses on loans, leases and unfunded lending commitments was primarily driven by U.S. Cards loan growth and a deterioration in macroeconomic assumptions.

Consumer ACLL

Citi's total consumer allowance for credit losses on loans (ACLL) as of December 31, 2022 was $14,119 million, an increase from $14,040 million at December 31, 2021. The increase in the ACLL balance was primarily driven by U.S. Cards loan growth and a deterioration in macroeconomic assumptions, partially offset by the reduction in reserves related to COVID-19 uncertainty.

Corporate ACLL

Citi's total corporate ACLL as of December 31, 2022 was $2,855 million, an increase from $2,415 million at December 31, 2021. The increase in the ACLL balance was primarily driven by a deterioration in macroeconomic assumptions, partially offset by the release of a COVID-19–related uncertainty reserve.

ACLUC

As of December 31, 2022, Citi's total allowance for credit losses on unfunded lending commitments (ACLUC), included in *Other liabilities*, was $2,151 million, an increase from $1,871 million at December 31, 2021. The increase in the ACLUC balance was primarily driven by a deterioration in macroeconomic assumptions.

Allowance for Credit Losses on Loans and End-of-Period Loans at December 31, 2021

In millions of dollars	Corporate	Consumer	Total
ACLL at beginning of year	$ 4,776	$ 20,180	$ 24,956
Gross credit losses on loans	(500)	(6,220)	(6,720)
Gross recoveries on loans	114	1,711	1,825
Replenishment of NCLs	386	4,509	4,895
Net reserve builds (releases)	(2,075)	(5,208)	(7,283)
Net specific reserve builds (releases)	(255)	(460)	(715)
Initial allowance for credit losses on newly purchased credit-deteriorated assets during the year	—	—	—
Other	(31)	(472)	(503)
Ending balance	$ 2,415	$ 14,040	$ 16,455
ACLL			
Collectively evaluated	$ 2,203	$ 13,227	$ 15,430
Individually evaluated	212	813	1,025
Purchased credit deteriorated	—	—	—
Total ACLL	$ 2,415	$ 14,040	$ 16,455
Loans, net of unearned income			
Collectively evaluated	$ 283,610	$ 372,655	$ 656,265
Individually evaluated	1,553	3,748	5,301
Purchased credit deteriorated	—	119	119
Held at fair value	6,070	12	6,082
Total loans, net of unearned income	$ 291,233	$ 376,534	$ 667,767

Allowance for Credit Losses on Loans at December 31, 2020

In millions of dollars	Corporate	Consumer	Total
ACLL at beginning of year	$ 2,727	$ 10,056	$ 12,783
Adjustments to opening balance:			
Financial instruments—credit losses (CECL)[1]	(816)	5,017	4,201
Variable post-charge-off third-party collection costs[1]	—	(443)	(443)
Adjusted ACLL at beginning of year	1,911	14,630	16,541
Gross credit losses on loans	(976)	(8,287)	(9,263)
Gross recoveries on loans	76	1,576	1,652
Replenishment of NCLs	900	6,711	7,611
Net reserve builds (releases)	2,551	5,084	7,635
Net specific reserve builds (releases)	249	427	676
Initial allowance for credit losses on newly purchased credit-deteriorated assets during the year	—	4	4
Other	65	35	100
Ending balance	$ 4,776	$ 20,180	$ 24,956

(1) See "Accounting Changes" in Note 1 for additional details.

Allowance for Credit Losses on HTM Debt Securities

In millions of dollars	Year ended December 31, 2022					
	Mortgage-backed	State and municipal	Foreign government	Asset-backed	All other debt securities	Total HTM
Allowance for credit losses on HTM debt securities at beginning of year	$ 6	$ 75	$ 4	$ 2	$ —	$ 87
Gross credit losses	—	—	—	—	—	—
Gross recoveries	—	—	—	—	—	—
Net credit losses (NCLs)	$ —	$ —	$ —	$ —	$ —	$ —
Replenishment of NCLs	$ —	$ —	$ —	$ —	$ —	$ —
Net reserve builds (releases)	(5)	37	—	1	—	33
Net specific reserve builds (releases)	—	—	—	—	—	—
Total provision for credit losses on HTM debt securities	$ (5)	$ 37	$ —	$ 1	$ —	$ 33
Other, net	$ —	$ 1	$ (1)	$ —	$ —	$ —
Allowance for credit losses on HTM debt securities at end of year	$ 1	$ 113	$ 3	$ 3	$ —	$ 120

In millions of dollars	Year ended December 31, 2021					
	Mortgage-backed	State and municipal	Foreign government	Asset-backed	All other debt securities	Total HTM
Allowance for credit losses on HTM debt securities at beginning of year	$ 3	$ 74	$ 6	$ 3	$ —	$ 86
Gross credit losses	—	—	—	—	—	—
Gross recoveries	3	—	—	—	—	3
Net credit losses (NCLs)	$ 3	$ —	$ —	$ —	$ —	$ 3
Replenishment of NCLs	$ (3)	$ —	$ —	$ —	$ —	$ (3)
Net reserve builds (releases)	7	1	(2)	(2)	—	4
Net specific reserve builds (releases)	(4)	—	—	—	—	(4)
Total provision for credit losses on HTM debt securities	$ —	$ 1	$ (2)	$ (2)	$ —	$ (3)
Other, net	$ —	$ —	$ —	$ 1	$ —	$ 1
Allowance for credit losses on HTM debt securities at end of year	$ 6	$ 75	$ 4	$ 2	$ —	$ 87

In millions of dollars	Year ended December 31, 2020					
	Mortgage-backed	State and municipal	Foreign government	Asset-backed	All other debt securities	Total HTM
Allowance for credit losses on HTM debt securities at beginning of year	$ —	$ —	$ —	$ —	$ —	$ —
Adjustment to opening balance for CECL adoption	—	61	4	5	—	70
Gross credit losses	—	—	—	—	—	—
Gross recoveries	—	—	—	—	—	—
Net credit losses (NCLs)	$ —	$ —	$ —	$ —	$ —	$ —
Replenishment of NCLs	$ —	$ —	$ —	$ —	$ —	$ —
Net reserve builds (releases)	(2)	10	(2)	1	—	7
Net specific reserve builds (releases)	—	—	—	—	—	—
Total provision for credit losses on HTM debt securities	$ (2)	$ 10	$ (2)	$ 1	$ —	$ 7
Other, net	$ 5	$ 3	$ 4	$ (3)	$ —	$ 9
Allowance for credit losses on HTM debt securities at end of year	$ 3	$ 74	$ 6	$ 3	$ —	$ 86

Allowance for Credit Losses on Other Assets

In millions of dollars	Deposits with banks	Securities borrowed and purchased under agreements to resell	Brokerage receivables	All other assets[1]	Total
	Year ended December 31, 2022				
Allowance for credit losses on other assets at beginning of year	**$ 21**	**$ 6**	**$ —**	**$ 26**	**$ 53**
Gross credit losses	—	—	—	(24)	(24)
Gross recoveries	—	—	—	3	3
Net credit losses (NCLs)	**$ —**	**$ —**	**$ —**	**$ (21)**	**$ (21)**
Replenishment of NCLs	$ —	$ —	$ —	$ 21	$ 21
Net reserve builds (releases)	30	14	—	11	55
Total provision for credit losses	**$ 30**	**$ 14**	**$ —**	**$ 32**	**$ 76**
Other, net[2]	$ —	$ 16	$ —	$ (1)	$ 15
Allowance for credit losses on other assets at end of year	**$ 51**	**$ 36**	**$ —**	**$ 36**	**$ 123**

(1) Primarily accounts receivable.
(2) Includes $30 million of ACL transferred from *ICG* loans ACL during the second quarter of 2022 for securities borrowed and purchased under agreements to resell.

In millions of dollars	Deposits with banks	Securities borrowed and purchased under agreements to resell	Brokerage receivables	All other assets[1]	Total
	Year ended December 31, 2021				
Allowance for credit losses on other assets at beginning of year	$ 20	$ 10	$ —	$ 25	$ 55
Gross credit losses	—	—	—	(2)	(2)
Gross recoveries	—	—	—	—	—
Net credit losses (NCLs)	$ —	$ —	$ —	$ (2)	$ (2)
Replenishment of NCLs	$ —	$ —	$ —	$ 2	$ 2
Net reserve builds (releases)	2	(4)	—	—	(2)
Total provision for credit losses	$ 2	$ (4)	$ —	$ 2	$ —
Other, net	$ (1)	$ —	$ —	$ 1	$ —
Allowance for credit losses on other assets at end of year	$ 21	$ 6	$ —	$ 26	$ 53

(1) Primarily accounts receivable.

In millions of dollars	Cash and due from banks	Deposits with banks	Securities borrowed and purchased under agreements to resell	Brokerage receivables	All other assets[1]	Total
	Year ended December 31, 2020					
Allowance for credit losses on other assets at beginning of year	$ —	$ —	$ —	$ —	$ —	$ —
Adjustment to opening balance for CECL adoption	6	14	2	1	3	26
Gross credit losses	—	—	—	—	—	—
Gross recoveries	—	—	—	—	—	—
Net credit losses (NCLs)	$ —	$ —	$ —	$ —	$ —	$ —
Replenishment of NCLs	$ —	$ —	$ —	$ —	$ —	$ —
Net reserve builds (releases)	(6)	5	8	(1)	1	7
Total provision for credit losses	$ (6)	$ 5	$ 8	$ (1)	$ 1	$ 7
Other, net	$ —	$ 1	$ —	$ —	$ 21	$ 22
Allowance for credit losses on other assets at end of year	$ —	$ 20	$ 10	$ —	$ 25	$ 55

(1) Primarily accounts receivable.

For ACL on AFS debt securities, see Note 13.

16. GOODWILL AND INTANGIBLE ASSETS

Goodwill

The changes in *Goodwill* were as follows:

In millions of dollars	Institutional Clients Group	Personal Banking and Wealth Management	Legacy Franchises	Total
Balance at December 31, 2019	$ 9,482	$ 10,015	$ 2,629	$ 22,126
Foreign exchange translation	(1)	7	30	36
Balance at December 31, 2020	$ 9,481	$ 10,022	$ 2,659	$ 22,162
Foreign exchange translation	(266)	(296)	179	(383)
Divestitures[1]	—	(9)	(471)	(480)
Balance at December 31, 2021	$ 9,215	$ 9,717	$ 2,367	$ 21,299
Foreign exchange translation	(229)	24	5	(200)
Divestitures[1]	—	—	(873)	(873)
Impairment of goodwill[2]	—	—	(535)	(535)
Balance at December 31, 2022	**$ 8,986**	**$ 9,741**	**$ 964**	**$ 19,691**

(1) Represents goodwill allocated to the Asia Consumer banking exit markets upon the signing of the respective sales agreements: in 2021, related to the Australia and Philippines consumer banking businesses, which were reclassified as HFS during 2021; in 2022, related to the India, Taiwan, Thailand, Malaysia, Indonesia, Bahrain and Vietnam consumer banking businesses, which were reclassified as HFS during 2022. See Note 2.

(2) Goodwill impairment of $535 million (approximately $489 million after-tax) was incurred in the Asia Consumer reporting unit of *Legacy Franchises* in the first quarter of 2022, due to the re-segmentation and change of reporting units as well as the sequence of the signing of sale agreements.

As discussed in Note 3, effective January 1, 2022, as part of its strategic refresh, Citi made changes to its management structure, which resulted in changes in its operating segments and reporting units to reflect how the CEO, who is the chief operating decision maker, manages the Company, including allocating resources and measuring performance. Goodwill balances were reallocated across the new reporting units based on their relative fair values using the valuation performed as of the effective date of the reorganization. Further, the goodwill balances associated with certain Asia Consumer businesses within the *Legacy Franchises* operating segment were reclassified to HFS as of March 31, 2022 upon the signing of the respective sale agreements. See Note 2 for a discussion of Citi's divestiture activities.

The reorganization of Citi's reporting structure and the announced sales of businesses within a reporting unit were identified as triggering events for purposes of goodwill impairment testing. Consistent with the requirements of ASC 350, interim goodwill impairment tests were performed that resulted in an impairment of $535 million to the Asia Consumer reporting unit within the *Legacy Franchises* operating segment, due to the implementation of Citi's revised operating segments and reporting units, as well as the timing of mutual execution of sale agreements for Asia consumer banking businesses. This impairment was recorded in the first quarter of 2022 as an operating expense. There were no additional impairment charges incurred as a result of any of the other interim goodwill impairment tests performed during 2022.

For the interim impairment tests performed in the first quarter of 2022, the valuation of reporting units used either the market approach, income approach, or a combination of both. Under the market approach, Citi estimated fair value by comparing the business to similar businesses or guideline companies whose securities are actively traded in public markets. Under the income approach, Citi used a discounted cash flow (DCF) model in which cash flows anticipated over several periods, plus a terminal value at the end of that time horizon, are discounted to their present value using an appropriate rate that is commensurate with the risk inherent within the reporting unit.

The key assumptions used to determine the fair value of Citi's reporting units consisted primarily of significant unobservable inputs (Level 3 fair value inputs), including discount rates, estimated cash flows, growth rates, earnings multiples and/or transaction multiples of similar businesses or guideline public companies, and bids from buyers. The DCF method employs a capital asset pricing model in estimating the discount rate based on several factors, including market interest rates, and includes adjustments for market risk and company-specific risk. Estimated cash flows are based on internally developed estimates and the growth rates are based on industry knowledge and historical performance.

Citi had historically performed its annual goodwill impairment test as of July 1 each year. During the quarter ended September 30, 2022, the Company voluntarily changed its annual impairment assessment date from July 1 to October 1. Based on interim impairment tests performed within the period between the previous annual test on July 1, 2021 and the annual test to be performed on October 1, 2022, no more than 12 months have elapsed between goodwill impairment tests of any of Citi's reporting units. The change in measurement date represents a change in method of applying an accounting principle. This change is preferable because it better aligns the Company's goodwill impairment testing procedures with its annual planning process and with its fiscal year-end. Citi continues to monitor each reporting unit for triggering events for purposes of goodwill impairment testing.

The change in accounting principle did not result in any delay, acceleration or avoidance of an impairment charge.

Citi performed its annual goodwill impairment test as of October 1, 2022, which resulted in no impairment of any of Citi's reporting units. While the inherent risk of uncertainty is embedded in the key assumptions used in the valuations, the economic and business environments continue to evolve as management implements its strategic refresh. If management's future estimate of key economic and market assumptions were to differ from its current assumptions, Citi could potentially experience material goodwill impairment charges in the future.

For additional information regarding Citi's goodwill impairment testing process, see the following Notes to the Consolidated Financial Statements: Note 1 for Citi's accounting policy for goodwill and Note 3 for a description of Citi's operating segments.

Intangible Assets

The components of intangible assets were as follows:

In millions of dollars	December 31, 2022 Gross carrying amount	Accumulated amortization	Net carrying amount	December 31, 2021 Gross carrying amount	Accumulated amortization	Net carrying amount
Purchased credit card relationships	$ 5,513	$ 4,426	$ 1,087	$ 5,579	$ 4,348	$ 1,231
Credit card contract-related intangibles[1]	3,903	1,518	2,385	3,912	1,372	2,540
Core deposit intangibles	37	37	—	39	39	—
Other customer relationships	373	283	90	429	305	124
Present value of future profits	32	31	1	31	29	2
Indefinite-lived intangible assets	192	—	192	183	—	183
Other	28	20	8	37	26	11
Intangible assets (excluding MSRs)	$ 10,078	$ 6,315	$ 3,763	$ 10,210	$ 6,119	$ 4,091
Mortgage servicing rights (MSRs)[2]	665	—	665	404	—	404
Total intangible assets	$ 10,743	$ 6,315	$ 4,428	$ 10,614	$ 6,119	$ 4,495

(1) Primarily reflects contract-related intangibles associated with the American Airlines, The Home Depot, Costco and AT&T credit card program agreements, which represented 97% of the aggregate net carrying amount as of December 31, 2022.

(2) See Note 22 for additional information on Citi's MSRs.

Intangible assets amortization expense was $352 million, $360 million and $419 million for 2022, 2021 and 2020, respectively. Intangible assets amortization expense is estimated to be $373 million in 2023, $381 million in 2024, $388 million in 2025, $348 million in 2026 and $341 million in 2027.

The changes in intangible assets were as follows:

In millions of dollars	Net carrying amount at December 31, 2021	Acquisitions/ renewals/ divestitures	Amortization	Impairments	FX translation and other	Net carrying amount at December 31, 2022
Purchased credit card relationships[1]	$ 1,231	$ 3	$ (140)	$ —	$ (7)	$ 1,087
Credit card contract-related intangibles[2]	2,540	—	(154)	—	(1)	2,385
Core deposit intangibles	—	—	—	—	—	—
Other customer relationships	124	10	(24)	—	(20)	90
Present value of future profits	2	—	(1)	—	—	1
Indefinite-lived intangible assets	183	—	—	—	9	192
Other	11	33	(33)	—	(3)	8
Intangible assets (excluding MSRs)	$ 4,091	$ 46	$ (352)	$ —	$ (22)	$ 3,763
Mortgage servicing rights (MSRs)[3]	404					665
Total intangible assets	$ 4,495					$ 4,428

(1) Reflects intangibles for the value of purchased cardholder relationships, which are discrete from partner contract-related intangibles, and includes credit card accounts primarily in the Costco, Macy's and Sears portfolios.

(2) Primarily reflects contract-related intangibles associated with the extension or renewal of existing credit card program agreements with American Airlines, The Home Depot, Costco and AT&T, which represent 97% and 97% of the aggregate net carrying amount at December 31, 2022 and 2021, respectively.

(3) See Note 22 for additional information on Citi's MSRs, including the rollforward from 2021 to 2022.

17. DEPOSITS

In millions of dollars	December 31, 2022	2021
Non-interest-bearing deposits in U.S. offices	$ 122,655	$ 158,552
Interest-bearing deposits in U.S. offices (including $903 and $879 as of December 31, 2022 and 2021, respectively, at fair value)	607,470	543,283
Total deposits in U.S. offices	$ 730,125	$ 701,835
Non-interest-bearing deposits in offices outside the U.S.	$ 95,182	$ 97,270
Interest-bearing deposits in offices outside the U.S. (including $972 and $787 as of December 31, 2022 and 2021, respectively, at fair value)	540,647	518,125
Total deposits in offices outside the U.S.	$ 635,829	$ 615,395
Total deposits	$ 1,365,954	$ 1,317,230

At December 31, 2022 and 2021, time deposits in denominations that met or exceeded the insured limit were as follows:

In millions of dollars	December 31, 2022	2021
U.S. offices[1]	$ 63,420	$ 9,153
Offices outside the U.S.[2]	150,921	77,698
Total	$ 214,341	$ 86,851

(1) Represents time deposits in U.S. offices in denominations that met or exceeded $250,000.
(2) Represents all time deposits outside U.S. offices as these deposits typically exceed the insured limit.

At December 31, 2022, the maturities of time deposits were as follows:

In millions of dollars	U.S.	Outside U.S.	Total
2023	$ 84,321	$ 149,604	$ 233,925
2024	5,751	1,018	6,769
2025	300	264	564
2026	386	26	412
2027	122	6	128
After 5 years	439	3	442
Total	$ 91,319	$ 150,921	$ 242,240

18. DEBT

Short-Term Borrowings

	December 31,			
	2022		2021	
In millions of dollars	Balance	Weighted average coupon	Balance	Weighted average coupon
Commercial paper				
Bank[1]	$11,185		$ 9,026	
Broker-dealer and other[2]	14,345		6,992	
Total commercial paper	$25,530	4.29 %	$16,018	0.22 %
Other borrowings[3]	21,566	4.23	11,955	0.91
Total	$47,096		$27,973	

(1) Represents Citibank entities as well as other bank entities.
(2) Represents broker-dealer and other non-bank subsidiaries that are consolidated into Citigroup Inc., the parent holding company.
(3) Includes borrowings from Federal Home Loan Banks and other market participants. At December 31, 2022 and 2021, collateralized short-term advances from Federal Home Loan Banks were $12.0 billion and $0.0 billion, respectively.

Some of Citigroup's non-bank subsidiaries have credit facilities with Citigroup's subsidiary depository institutions, including Citibank. Borrowings under these facilities are secured in accordance with Section 23A of the Federal Reserve Act.

Citigroup Global Markets Holdings Inc. (CGMHI) has borrowing agreements consisting of facilities that CGMHI has been advised are available, but where no contractual lending obligation exists. These arrangements are reviewed on an ongoing basis to ensure flexibility in meeting CGMHI's short-term requirements.

Long-Term Debt

			Balances at December 31,	
In millions of dollars	Weighted average coupon[1]	Maturities	2022	2021
Citigroup Inc.[2]				
Senior debt	3.38 %	2023–2098	$ 141,893	$ 137,651
Subordinated debt[3]	4.77	2023–2046	22,758	25,560
Trust preferred securities	10.53	2036–2040	1,606	1,734
Bank[4]				
Senior debt	3.98	2023–2039	21,113	23,567
Broker-dealer[5]				
Senior debt	3.95	2023–2070	84,236	65,862
Total	3.72 %		$ 271,606	$ 254,374
Senior debt			$ 247,242	$ 227,080
Subordinated debt[3]			22,758	25,560
Trust preferred securities			1,606	1,734
Total			$ 271,606	$ 254,374

(1) The weighted average coupon excludes structured notes accounted for at fair value.
(2) Represents the parent holding company.
(3) Includes notes that are subordinated within certain countries, regions or subsidiaries.
(4) Represents Citibank entities as well as other bank entities. At December 31, 2022 and 2021, collateralized long-term advances from Federal Home Loan Banks were $7.3 billion and $5.3 billion, respectively.
(5) Represents broker-dealer and other non-bank subsidiaries that are consolidated into Citigroup Inc., the parent holding company. Certain Citigroup consolidated hedging activities are also included in this line. Balances primarily relates to senior debt.

The Company issues both fixed- and variable-rate debt in a range of currencies. It uses derivative contracts, primarily interest rate swaps, to effectively convert a portion of its fixed-rate debt to variable-rate debt. The maturity structure of the derivatives generally corresponds to the maturity structure of the debt being hedged. In addition, the Company uses other derivative contracts to manage the foreign exchange impact of certain debt issuances. At December 31, 2022, the Company's overall weighted average interest rate for long-term debt, excluding structured notes accounted for at fair value, was 3.72% on a contractual basis and 4.10% including the effects of derivative contracts.

Aggregate annual maturities of long-term debt obligations (based on final maturity dates) including trust preferred securities are as follows:

In millions of dollars	2023	2024	2025	2026	2027	Thereafter	Total
Citigroup Inc.	$ 6,887	$ 12,321	$ 19,124	$ 27,913	$ 12,601	$ 87,411	$ 166,257
Bank	7,029	8,152	1,867	197	788	3,080	21,113
Broker-dealer	18,543	20,043	11,758	4,680	7,383	21,829	84,236
Total	$ 32,459	$ 40,516	$ 32,749	$ 32,790	$ 20,772	$ 112,320	$ 271,606

The following table summarizes Citi's outstanding trust preferred securities at December 31, 2022:

						Junior subordinated debentures owned by trust		
Trust	**Issuance date**	**Securities issued**	**Liquidation value[1]**	**Coupon rate[2]**	**Common shares issued to parent**	**Notional amount**	**Maturity**	**Redeemable by issuer beginning**
In millions of dollars, except securities and share amounts								
Citigroup Capital III	Dec. 1996	194,053	$ 194	7.625 %	6,003	$ 200	Dec. 1, 2036	Not redeemable
Citigroup Capital XIII	Oct. 2010	89,840,000	2,246	3 mo LIBOR + 637 bps	1,000	2,246	Oct. 30, 2040	Oct. 30, 2015
Total obligated			**$ 2,440**			**$ 2,446**		

Note: Distributions on the trust preferred securities and interest on the subordinated debentures are payable semiannually for Citigroup Capital III and quarterly for Citigroup Capital XIII.

(1) Represents the notional value received by outside investors from the trusts at the time of issuance. This differs from Citi's balance sheet carrying value due primarily to unamortized discount and issuance costs.

(2) In each case, the coupon rate on the subordinated debentures is the same as that on the trust preferred securities.

19. REGULATORY CAPITAL

Citigroup is subject to risk-based capital and leverage standards issued by the Federal Reserve Board, which constitute the U.S. Basel III rules. Citi's U.S.-insured depository institution subsidiaries, including Citibank, are subject to similar standards issued by their respective primary bank regulatory agencies. These standards are used to evaluate capital adequacy and include the required minimums shown in the following table. The regulatory agencies are required by law to take specific, prompt corrective actions with respect to institutions that do not meet minimum capital standards.

The following table presents for Citigroup and Citibank the regulatory capital tiers, total risk-weighted assets, quarterly adjusted average total assets, Total Leverage Exposure, risk-based capital ratios and leverage ratios:

		Citigroup			Citibank		
In millions of dollars, except ratios	Stated minimum	Well-capitalized minimum	December 31, 2022	December 31, 2021	Well-capitalized minimum	December 31, 2022	December 31, 2021
CET1 Capital			$ 148,930	$ 149,305		$ 149,593	$ 148,548
Tier 1 Capital			169,145	169,568		151,720	150,679
Total Capital (Tier 1 Capital + Tier 2 Capital)—Standardized Approach			197,543	203,838		172,647	175,427
Total Capital (Tier 1 Capital + Tier 2 Capital)—Advanced Approaches			188,839	194,006		165,131	166,921
Total risk-weighted assets—Standardized Approach			1,142,985	1,219,175		982,914	1,066,015
Total risk-weighted assets—Advanced Approaches			1,221,538	1,209,374		1,003,747	1,017,774
Quarterly adjusted average total assets[1]			2,395,863	2,351,434		1,738,744	1,716,596
Total Leverage Exposure[2]			2,906,773	2,957,764		2,189,541	2,236,839
CET1 Capital ratio[3]	4.5 %	N/A	13.03 %	12.25 %	6.5 %	14.90 %	13.93 %
Tier 1 Capital ratio[3]	6.0	6.0 %	14.80	13.91	8.0	15.12	14.13
Total Capital ratio[3]	8.0	10.0	15.46	16.04	10.0	16.45	16.40
Tier 1 Leverage ratio	4.0	N/A	7.06	7.21	5.0	8.73	8.78
Supplementary Leverage ratio	3.0	N/A	5.82	5.73	6.0	6.93	6.74

(1) Tier 1 Leverage ratio denominator.
(2) Supplementary Leverage ratio denominator.
(3) Citi's binding CET1 Capital and Tier 1 Capital ratios were derived under the Basel III Standardized Approach as of December 31, 2022 and 2021, whereas Citi's binding Total Capital ratio was derived under the Basel III Advanced Approaches framework for both periods presented. Citibank's binding CET1 Capital and Tier 1 Capital ratios were derived under the Basel III Advanced Approaches framework as of December 31, 2022, and were derived under the Basel III Standardized Approach as of December 31, 2021. Citibank's binding Total Capital ratio was derived under the Basel III Advanced Approaches framework for both periods presented.

N/A Not applicable

As indicated in the table above, Citigroup and Citibank were "well capitalized" under the current federal bank regulatory agencies definitions as of December 31, 2022 and 2021.

Banking Subsidiaries—Constraints on Dividends

There are various legal limitations on the ability of Citigroup's subsidiary depository institutions to extend credit, pay dividends or otherwise supply funds to Citigroup and its non-bank subsidiaries. The approval of the Office of the Comptroller of the Currency is required if total dividends declared in any calendar year were to exceed amounts specified by the agency's regulations.

In determining the dividends, each subsidiary depository institution must also consider its effect on applicable risk-based capital and leverage ratio requirements, as well as policy statements of the federal bank regulatory agencies that indicate that banking organizations should generally pay dividends out of current operating earnings. Citigroup received $8.5 billion and $6.2 billion in dividends indirectly from Citibank through its holding company during 2022 and 2021, respectively.

20. CHANGES IN ACCUMULATED OTHER COMPREHENSIVE INCOME (LOSS) (AOCI)

Changes in each component of Citigroup's *Accumulated other comprehensive income (loss)* were as follows:

In millions of dollars	Net unrealized gains (losses) on debt securities	Debt valuation adjustment (DVA)[1]	Cash flow hedges[2]	Benefit plans[3]	CTA, net of hedges[4][5]	Excluded component of fair value hedges	Accumulated other comprehensive income (loss)
Balance, December 31, 2019	$ (265)	$ (944)	$ 123	$ (6,809)	$ (28,391)	$ (32)	$ (36,318)
Other comprehensive income before reclassifications	4,837	(490)	2,027	(287)	(250)	(15)	5,822
Increase (decrease) due to amounts reclassified from *AOCI*	(1,252)	15	(557)	232	—	—	(1,562)
Change, net of taxes	$ 3,585	$ (475)	$ 1,470	$ (55)	$ (250)	$ (15)	$ 4,260
Balance, December 31, 2020	$ 3,320	$ (1,419)	$ 1,593	$ (6,864)	$ (28,641)	$ (47)	$ (32,058)
Other comprehensive income before reclassifications	(3,556)	121	(679)	797	(2,537)	(11)	(5,865)
Increase (decrease) due to amounts reclassified from *AOCI*	(378)	111	(813)	215	12	11	(842)
Change, net of taxes	$ (3,934)	$ 232	$ (1,492)	$ 1,012	$ (2,525)	$ —	$ (6,707)
Balance, December 31, 2021	$ (614)	$ (1,187)	$ 101	$ (5,852)	$ (31,166)	$ (47)	$ (38,765)
Other comprehensive income before reclassifications	**(5,599)**	**2,047**	**(2,718)**	**(19)**	**(2,855)**	**49**	**(9,095)**
Increase (decrease) due to amounts reclassified from *AOCI*	**215**	**(18)**	**95**	**116**	**384**	**6**	**798**
Change, net of taxes	$ **(5,384)**	$ **2,029**	$ **(2,623)**	$ **97**	$ **(2,471)**	$ **55**	$ **(8,297)**
Balance, December 31, 2022	$ **(5,998)**	$ **842**	$ **(2,522)**	$ **(5,755)**	$ **(33,637)**	$ **8**	$ **(47,062)**

(1) Reflects the after-tax valuation of Citi's fair value option liabilities. See "Market Valuation Adjustments" in Note 25.

(2) Primarily driven by Citi's pay floating/receive fixed interest rate swap programs that hedge certain floating rates on assets.

(3) Primarily reflects adjustments based on the quarterly actuarial valuations of the Company's significant pension and postretirement plans, annual actuarial valuations of all other plans and amortization of amounts previously recognized in other comprehensive income.

(4) Primarily reflects the movements in (by order of impact) the Indian rupee, South Korean won, Euro, Chinese yuan, Russian ruble, Japanese yen and British pound sterling against the U.S. dollar and changes in related tax effects and hedges for the year ended December 31, 2022. Primarily reflects the movements in (by order of impact) the Mexican peso, Euro, South Korean won, Chilean peso and Japanese yen against the U.S. dollar and changes in related tax effects and hedges for the year ended December 31, 2021. Primarily reflects the movements in (by order of impact) the Mexican peso, Brazilian real, South Korean won and Euro against the U.S. dollar and changes in related tax effects and hedges for the year ended December 31, 2020. Amounts recorded in the CTA component of *AOCI* remain in *AOCI* until the sale or substantial liquidation of the foreign entity, at which point such amounts related to the foreign entity are reclassified into earnings.

(5) December 31, 2022 reflects a reduction from an approximate $470 million (after-tax) ($620 million pretax) CTA loss (net of hedges) recorded in June 2022, associated with the closing of Citi's sale of its consumer banking business in Australia (see Note 2). The reduction from *AOCI* had a neutral impact on Citi's CET1 Capital.

The pretax and after-tax changes in each component of *Accumulated other comprehensive income (loss)* were as follows:

In millions of dollars	Pretax	Tax effect[1]	After-tax
Balance, December 31, 2019	$ (42,772)	$ 6,454	$ (36,318)
Change in net unrealized gains (losses) on debt securities	4,799	(1,214)	3,585
Debt valuation adjustment (DVA)	(616)	141	(475)
Cash flow hedges	1,925	(455)	1,470
Benefit plans	(78)	23	(55)
CTA	(227)	(23)	(250)
Excluded component of fair value hedges	(23)	8	(15)
Change	$ 5,780	$ (1,520)	$ 4,260
Balance, December 31, 2020	$ (36,992)	$ 4,934	$ (32,058)
Change in net unrealized gains (losses) on debt securities	(5,301)	1,367	(3,934)
Debt valuation adjustment (DVA)	296	(64)	232
Cash flow hedges	(1,969)	477	(1,492)
Benefit plans	1,252	(240)	1,012
CTA	(2,671)	146	(2,525)
Excluded component of fair value hedges	2	(2)	—
Change	$ (8,391)	$ 1,684	$ (6,707)
Balance, December 31, 2021	$ (45,383)	$ 6,618	$ (38,765)
Change in net unrealized gains (losses) on debt securities	**(7,178)**	**1,794**	**(5,384)**
Debt valuation adjustment (DVA)	**2,685**	**(656)**	**2,029**
Cash flow hedges	**(3,477)**	**854**	**(2,623)**
Benefit plans	**31**	**66**	**97**
CTA	**(2,004)**	**(467)**	**(2,471)**
Excluded component of fair value hedges	**73**	**(18)**	**55**
Change	**$ (9,870)**	**$ 1,573**	**$ (8,297)**
Balance, December 31, 2022	**$ (55,253)**	**$ 8,191**	**$ (47,062)**

(1) Income tax effects of these items are released from *AOCI* contemporaneously with the related gross pretax amount.

The Company recognized pretax (gains) losses related to amounts in *AOCI* reclassified to the Consolidated Statement of Income as follows:

	Increase (decrease) in AOCI due to amounts reclassified to Consolidated Statement of Income		
	Year ended December 31,		
In millions of dollars	2022	2021	2020
Realized (gains) losses on sales of investments	$ (67)	$ (665)	$ (1,756)
Gross impairment losses	360	181	109
Subtotal, pretax	$ 293	$ (484)	$ (1,647)
Tax effect	(78)	106	395
Net realized (gains) losses on investments, after-tax[1]	$ 215	$ (378)	$ (1,252)
Realized DVA (gains) losses on fair value option liabilities, pretax	$ (25)	$ 144	$ 20
Tax effect	7	(33)	(5)
Net realized DVA, after-tax	$ (18)	$ 111	$ 15
Interest rate contracts	$ 125	$ (1,075)	$ (734)
Foreign exchange contracts	4	4	4
Subtotal, pretax	$ 129	$ (1,071)	$ (730)
Tax effect	(34)	258	173
Amortization of cash flow hedges, after-tax[2]	$ 95	$ (813)	$ (557)
Amortization of unrecognized:			
Prior service cost (benefit)	$ (23)	$ (23)	$ (5)
Net actuarial loss	221	302	322
Curtailment/settlement impact[3]	(37)	11	(8)
Subtotal, pretax	$ 161	$ 290	$ 309
Tax effect	(45)	(75)	(77)
Amortization of benefit plans, after-tax[3]	$ 116	$ 215	$ 232
Excluded component of fair value hedges, pretax	$ 9	$ 15	$ —
Tax effect	(3)	(4)	—
Excluded component of fair value hedges, after-tax	$ 6	$ 11	$ —
CTA, pretax	$ 438	$ 19	$ —
Tax effect	(54)	(7)	—
CTA, after-tax[4]	$ 384	$ 12	$ —
Total amounts reclassified out of *AOCI*, pretax	$ 1,005	$ (1,087)	$ (2,048)
Total tax effect	(207)	245	486
Total amounts reclassified out of *AOCI*, after-tax	$ 798	$ (842)	$ (1,562)

(1) The pretax amount is reclassified to *Realized gains (losses) on sales of investments, net* and *Gross impairment losses* in the Consolidated Statement of Income. See Note 13 for additional details.
(2) See Note 23 for additional details.
(3) See Note 8 for additional details.
(4) The pretax amount is reclassified to *Discontinued operations* and *Other revenue* in the Consolidated Statement of Income, and results primarily from the substantial liquidation of a legacy U.K. consumer operation and divestitures of certain legacy foreign operations. See Note 2 for additional details.

21. PREFERRED STOCK

The following table summarizes the Company's preferred stock outstanding:

	Issuance date	Redeemable by issuer beginning	Dividend rate	Redemption price per depositary share/ preference share	Number of depositary shares	Carrying value (in millions of dollars) December 31, 2022	Carrying value (in millions of dollars) December 31, 2021
Series A[(1)]	October 29, 2012	January 30, 2023	5.950 %	$ 1,000	1,500,000	$ 1,500	$ 1,500
Series B[(2)]	December 13, 2012	February 15, 2023	5.900	1,000	750,000	750	750
Series D[(3)]	April 30, 2013	May 15, 2023	5.350	1,000	1,250,000	1,250	1,250
Series J[(4)]	September 19, 2013	September 30, 2023	7.125	25	38,000,000	950	950
Series K[(5)]	October 31, 2013	November 15, 2023	6.875	25	59,800,000	1,495	1,495
Series M[(6)]	April 30, 2014	May 15, 2024	6.300	1,000	1,750,000	1,750	1,750
Series P[(7)]	April 24, 2015	May 15, 2025	5.950	1,000	2,000,000	2,000	2,000
Series T[(8)]	April 25, 2016	August 15, 2026	6.250	1,000	1,500,000	1,500	1,500
Series U[(9)]	September 12, 2019	September 12, 2024	5.000	1,000	1,500,000	1,500	1,500
Series V[(10)]	January 23, 2020	January 30, 2025	4.700	1,000	1,500,000	1,500	1,500
Series W[(11)]	December 10, 2020	December 10, 2025	4.000	1,000	1,500,000	1,500	1,500
Series X[(12)]	February 18, 2021	February 18, 2026	3.875	1,000	2,300,000	2,300	2,300
Series Y[(13)]	October 20, 2021	October 20, 2026	4.150	1,000	1,000,000	1,000	1,000
						$ 18,995	$ 18,995

(1) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on January 30 and July 30 at a fixed rate until, but excluding, January 30, 2023, thereafter payable quarterly on January 30, April 30, July 30 and October 30 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(2) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on February 15 and August 15 at a fixed rate until, but excluding, February 15, 2023, thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(3) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on May 15 and November 15 at a fixed rate until, but excluding, May 15, 2023, thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(4) Issued as depositary shares, each representing a 1/1,000th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable quarterly on March 30, June 30, September 30 and December 30 at a fixed rate until, but excluding, September 30, 2023, thereafter payable quarterly on the same dates at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(5) Issued as depositary shares, each representing a 1/1,000th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable quarterly on February 15, May 15, August 15 and November 15 at a fixed rate until, but excluding, November 15, 2023, thereafter payable quarterly on the same dates at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(6) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on May 15 and November 15 at a fixed rate until, but excluding, May 15, 2024, thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(7) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on May 15 and November 15 at a fixed rate until, but excluding, May 15, 2025, and thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(8) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on February 15 and August 15 at a fixed rate until, but excluding, August 15, 2026, thereafter payable quarterly on February 15, May 15, August 15 and November 15 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(9) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on March 12 and September 12 at a fixed rate until, but excluding, September 12, 2024, thereafter payable quarterly on March 12, June 12, September 12 and December 12 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(10) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable semiannually on January 30 and July 30 at a fixed rate until, but excluding, January 30, 2025, thereafter payable quarterly on January 30, April 30, July 30 and October 30 at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(11) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable quarterly on March 10, June 10, September 10 and December 10 at a fixed rate until, but excluding, December 10, 2025, thereafter payable quarterly on the same dates at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(12) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable quarterly on February 18, May 18, August 18 and November 18 at a fixed rate until, but excluding, February 18, 2026, thereafter payable quarterly on the same dates at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

(13) Issued as depositary shares, each representing a 1/25th interest in a share of the corresponding series of non-cumulative perpetual preferred stock. Dividends are payable quarterly on February 15, May 15, August 15 and November 15 at a fixed rate until, but excluding, November 15, 2026, thereafter payable quarterly on the same dates at a floating rate, in each case when, as and if declared by the Citi Board of Directors.

22. SECURITIZATIONS AND VARIABLE INTEREST ENTITIES

Uses of Special Purpose Entities

A special purpose entity (SPE) is an entity designed to fulfill a specific limited need of the company that organized it. The principal uses of SPEs by Citi are to assist clients in securitizing their financial assets and create investment products for clients and to obtain liquidity and optimize capital efficiency by securitizing certain of Citi's financial assets. SPEs may be organized in various legal forms, including trusts, partnerships or corporations. In a securitization, through the SPE's issuance of debt and equity instruments, certificates, commercial paper or other notes of indebtedness, the company transferring assets to the SPE converts all (or a portion) of those assets into cash before they would have been realized in the normal course of business. These issuances are recorded on the balance sheet of the SPE, which may or may not be consolidated onto the balance sheet of the company that organized the SPE.

Investors usually have recourse only to the assets in the SPE, but may also benefit from other credit enhancements, such as a collateral account, a line of credit or a liquidity facility, such as a liquidity put option or asset purchase agreement. Because of these enhancements, the SPE issuances typically obtain a more favorable credit rating than the transferor could obtain for its own debt issuances. This results in less expensive financing costs than unsecured debt. The SPE may also enter into derivative contracts in order to convert the yield or currency of the underlying assets to match the needs of the SPE investors or to limit or change the credit risk of the SPE. Citigroup may be the provider of certain credit enhancements as well as the counterparty to any related derivative contracts.

Most of Citigroup's SPEs are variable interest entities (VIEs).

Variable Interest Entities

VIEs are described in Note 1. Investors that finance the VIE through debt or equity interests or other counterparties providing other forms of support, such as guarantees, certain fee arrangements or certain types of derivative contracts, are variable interest holders in the entity.

The variable interest holder, if any, that has a controlling financial interest in a VIE is deemed to be the primary beneficiary and must consolidate the VIE.

The Company must evaluate each VIE to understand the purpose and design of the entity, the role the Company had in the entity's design and its involvement in the VIE's ongoing activities. The Company then must evaluate which activities most significantly impact the economic performance of the VIE and who has the power to direct such activities.

For those VIEs where the Company determines that it has the power to direct the activities that most significantly impact the VIE's economic performance, the Company must then evaluate its economic interests, if any, and determine whether it could absorb losses or receive benefits that could potentially be significant to the VIE. When evaluating whether the Company has an obligation to absorb losses that could potentially be significant, it considers the maximum exposure to such loss without consideration of probability. Such obligations could be in various forms, including, but not limited to, debt and equity investments, guarantees, liquidity agreements and certain derivative contracts.

In various other transactions, the Company may (i) act as a derivative counterparty (e.g., interest rate swap, cross-currency swap or purchaser of credit protection under a credit default swap or total return swap where the Company pays the total return on certain assets to the SPE), (ii) act as underwriter or placement agent, (iii) provide administrative, trustee or other services or (iv) make a market in debt securities or other instruments issued by VIEs. The Company generally considers such involvement, by itself, not to be variable interests and thus not an indicator of power or potentially significant benefits or losses.

Citigroup's involvement with consolidated and unconsolidated VIEs with which the Company holds significant variable interests or has continuing involvement through servicing a majority of the assets in a VIE is presented below:

	As of December 31, 2022							
				Maximum exposure to loss in significant unconsolidated VIEs[1]				
				Funded exposures[2]		Unfunded exposures		
In millions of dollars	Total involvement with SPE assets	Consolidated VIE/SPE assets	Significant unconsolidated VIE assets[3]	Debt investments	Equity investments	Funding commitments	Guarantees and derivatives	Total
Credit card securitizations	$ 32,021	$ 32,021	$ —	$ —	$ —	$ —	$ —	$ —
Mortgage securitizations[4]								
U.S. agency-sponsored	117,358	—	117,358	2,052	—	—	48	2,100
Non-agency-sponsored	67,704	—	67,704	3,294	—	—	—	3,294
Citi-administered asset-backed commercial paper conduits	19,621	19,621	—	—	—	—	—	—
Collateralized loan obligations (CLOs)	7,600	—	7,600	2,601	—	—	—	2,601
Asset-based financing[5]	242,348	9,672	232,676	40,121	1,022	10,726	—	51,869
Municipal securities tender option bond trusts (TOBs)	2,155	672	1,483	2	—	1,108	—	1,110
Municipal investments	22,167	3	22,164	2,731	3,143	3,420	—	9,294
Client intermediation	482	121	361	58	—	—	13	71
Investment funds	534	91	443	2	5	68	—	75
Other	—	—	—	—	—	—	—	—
Total	$ 511,990	$ 62,201	$ 449,789	$ 50,861	$ 4,170	$ 15,322	$ 61	$ 70,414

	As of December 31, 2021							
				Maximum exposure to loss in significant unconsolidated VIEs[1]				
				Funded exposures[2]		Unfunded exposures		
In millions of dollars	Total involvement with SPE assets	Consolidated VIE/SPE assets	Significant unconsolidated VIE assets[3]	Debt investments	Equity investments	Funding commitments	Guarantees and derivatives	Total
Credit card securitizations	$ 31,518	$ 31,518	$ —	$ —	$ —	$ —	$ —	$ —
Mortgage securitizations[4]								
U.S. agency-sponsored	113,641	—	113,641	1,582	—	—	43	1,625
Non-agency-sponsored	60,851	632	60,219	2,479	—	5	—	2,484
Citi-administered asset-backed commercial paper conduits	14,018	14,018	—	—	—	—	—	—
Collateralized loan obligations (CLOs)	8,302	—	8,302	2,636	—	—	—	2,636
Asset-based financing[5]	246,632	11,085	235,547	32,242	1,139	12,189	—	45,570
Municipal securities tender option bond trusts (TOBs)	3,251	905	2,346	2	—	1,498	—	1,500
Municipal investments	20,597	3	20,594	2,512	3,617	3,562	—	9,691
Client intermediation	904	297	607	75	—	—	224	299
Investment funds	498	179	319	—	—	12	1	13
Other	—	—	—	—	—	—	—	—
Total	$ 500,212	$ 58,637	$ 441,575	$ 41,528	$ 4,756	$ 17,266	$ 268	$ 63,818

(1) The definition of maximum exposure to loss is included in the text that follows this table.
(2) Included on Citigroup's December 31, 2022 and 2021 Consolidated Balance Sheet.
(3) A significant unconsolidated VIE is an entity in which the Company has any variable interest or continuing involvement considered to be significant, regardless of the likelihood of loss.
(4) Citigroup mortgage securitizations also include agency and non-agency (private label) re-securitization activities. These SPEs are not consolidated. See "Re-securitizations" below for further discussion.
(5) Included within this line are loans to third-party-sponsored private equity funds, which represent $69 billion and $100 billion in unconsolidated VIE assets and $498 million and $497 million in maximum exposure to loss as of December 31, 2022 and 2021, respectively.

The previous tables do not include:

- certain investment funds for which the Company provides investment management services and personal estate trusts for which the Company provides administrative, trustee and/or investment management services;
- certain third-party-sponsored private equity funds to which the Company provides secured credit facilities. The Company has no decision-making power and does not consolidate these funds, some of which may meet the definition of a VIE. The Company's maximum exposure to loss is generally limited to a loan or lending-related commitment. As of December 31, 2022 and 2021, the Company's maximum exposure to loss related to these transactions was $33.6 billion and $55.6 billion, respectively (see Notes 14 and 26 for more information on these positions);
- certain VIEs structured by third parties in which the Company holds securities in inventory, as these investments are made on arm's-length terms;
- certain positions in mortgage- and asset-backed securities held by the Company, which are classified as *Trading account assets* or *Investments*, in which the Company has no other involvement with the related securitization entity deemed to be significant (see Notes 13 and 25 for more information on these positions);
- certain representations and warranties exposures in Citigroup residential mortgage securitizations, in which the original mortgage loan balances are no longer outstanding; and
- VIEs such as preferred securities trusts used in connection with the Company's funding activities. The Company does not have a variable interest in these trusts.

The asset balances for consolidated VIEs represent the carrying amounts of the assets consolidated by the Company. The carrying amount may represent the amortized cost or the current fair value of the assets depending on the classification of the asset (e.g., loan or security) and the associated accounting model ascribed to that classification.

The asset balances for unconsolidated VIEs in which the Company has significant involvement represent the most current information available to the Company. In most cases, the asset balances represent an amortized cost basis without regard to impairments, unless fair value information is readily available to the Company.

The maximum funded exposure represents the balance sheet carrying amount of the Company's investment in the VIE. It reflects the initial amount of cash invested in the VIE, adjusted for any accrued interest and cash principal payments received. The carrying amount may also be adjusted for increases or declines in fair value or any impairment in value recognized in earnings. The maximum exposure of unfunded positions represents the remaining undrawn committed amount, including liquidity and credit facilities provided by the Company or the notional amount of a derivative instrument considered to be a variable interest. In certain transactions, the Company has entered into derivative instruments or other arrangements that are not considered variable interests in the VIE (e.g., interest rate swaps, cross-currency swaps or where the Company is the purchaser of credit protection under a credit default swap or total return swap where the Company pays the total return on certain assets to the SPE). Receivables under such arrangements are not included in the maximum exposure amounts.

The following tables present certain assets and liabilities of consolidated variable interest entities (VIEs), which are included on Citi's Consolidated Balance Sheet. The assets in the table below include those assets that can only be used to settle obligations of consolidated VIEs, presented on the following page, and are in excess of those obligations. In addition, the assets in the table below include third-party assets of consolidated VIEs only and exclude intercompany balances that eliminate in consolidation. The liabilities in the table below include third-party liabilities of consolidated VIEs only and exclude intercompany balances that eliminate in consolidation. The liabilities also exclude amounts where creditors or beneficial interest holders have recourse to the general credit of Citigroup.

In millions of dollars	December 31, 2022	2021
Assets of consolidated VIEs to be used to settle obligations of consolidated VIEs		
Cash and due from banks	$ **61**	$ 260
Trading account assets	**9,153**	10,038
Investments	**594**	844
Loans, net of unearned income		
Consumer	**35,026**	34,677
Corporate	**19,782**	14,312
Loans, net of unearned income	$ **54,808**	$ 48,989
Allowance for credit losses on loans (ACLL)	**(2,520)**	(2,668)
Total loans, net	$ **52,288**	$ 46,321
Other assets	**105**	1,174
Total assets of consolidated VIEs to be used to settle obligations of consolidated VIEs	$ **62,201**	$ 58,637

In millions of dollars	December 31, 2022	2021
Liabilities of consolidated VIEs for which creditors or beneficial interest holders do not have recourse to the general credit of Citigroup		
Short-term borrowings	$ **9,807**	$ 8,376
Long-term debt	**10,324**	12,579
Other liabilities	**622**	694
Total liabilities of consolidated VIEs for which creditors or beneficial interest holders do not have recourse to the general credit of Citigroup	$ **20,753**	$ 21,649

Funding Commitments for Significant Unconsolidated VIEs—Liquidity Facilities and Loan Commitments

The following table presents the notional amount of liquidity facilities and loan commitments that are classified as funding commitments in the VIE tables above:

	December 31, 2022		December 31, 2021	
In millions of dollars	Liquidity facilities	Loan/equity commitments	Liquidity facilities	Loan/equity commitments
Non-agency-sponsored mortgage securitizations	$ **—**	$ **—**	$ —	$ 5
Asset-based financing	**—**	**10,726**	—	12,189
Municipal securities tender option bond trusts (TOBs)	**1,108**	**—**	1,498	—
Municipal investments	**—**	**3,420**	—	3,562
Investment funds	**—**	**68**	—	12
Other	**—**	**—**	—	—
Total funding commitments	$ **1,108**	$ **14,214**	$ 1,498	$ 15,768

Consolidated VIEs

The Company engages in on-balance sheet securitizations, which are securitizations that do not qualify for sales treatment; thus, the assets remain on Citi's Consolidated Balance Sheet, and any proceeds received are recognized as secured liabilities. In general, the third-party investors in the obligations of consolidated VIEs have legal recourse only to the assets of the respective VIEs and do not have such recourse to the Company, except where Citi has provided a guarantee to the investors or is the counterparty to certain derivative transactions involving the VIE. Thus, Citigroup's maximum legal exposure to loss related to consolidated VIEs is significantly less than the carrying value of the consolidated VIE assets due to outstanding third-party financing. Intercompany assets and liabilities are excluded from Citi's Consolidated Balance Sheet. All VIE assets are restricted from being sold or pledged as collateral. The cash flows from these assets are the only source used to pay down the associated liabilities, which are non-recourse to Citi's general assets. See the Consolidated Balance Sheet for more information about these Consolidated VIE assets and liabilities.

Significant Interests in Unconsolidated VIEs—Balance Sheet Classification

The following table presents the carrying amounts and classification of significant variable interests in unconsolidated VIEs:

In billions of dollars	**December 31, 2022**	December 31, 2021
Cash	$ —	$ —
Trading account assets	**1.6**	1.4
Investments	**8.6**	8.8
Total loans, net of allowance	**44.2**	35.4
Other	**0.6**	0.8
Total assets	$ **55.0**	$ 46.4

Credit Card Securitizations

The Company securitizes credit card receivables through trusts established to purchase the receivables. Citigroup transfers receivables into the trusts on a non-recourse basis. Credit card securitizations are revolving securitizations: as customers pay their credit card balances, the cash proceeds are used to purchase new receivables and replenish the receivables in the trust.

Substantially all of the Company's credit card securitization activity is through two trusts—Citibank Credit Card Master Trust (Master Trust) and Citibank Omni Trust (Omni Trust), with the substantial majority through the Master Trust. These trusts are consolidated entities because, as servicer, Citigroup has the power to direct the activities that most significantly impact the economic performance of the trusts. Citigroup holds a seller's interest and certain securities issued by the trusts, which could result in exposure to potentially significant losses or benefits from the trusts. Accordingly, the transferred credit card receivables remain on Citi's Consolidated Balance Sheet with no gain or loss recognized. The debt issued by the trusts to third parties is included on Citi's Consolidated Balance Sheet.

Citi utilizes securitizations as one of the sources of funding for its business in North America. The following table reflects amounts related to the Company's securitized credit card receivables:

In billions of dollars	**December 31, 2022**	December 31, 2021
Ownership interests in principal amount of trust credit card receivables		
Sold to investors via trust-issued securities	$ **7.9**	$ 9.7
Retained by Citigroup as trust-issued securities	**6.4**	7.2
Retained by Citigroup via non-certificated interests	**19.5**	16.1
Total	$ **33.8**	$ 33.0

The following table summarizes selected cash flow information related to Citigroup's credit card securitizations:

In billions of dollars	**2022**	2021	2020
Proceeds from new securitizations	$ **0.3**	$ —	$ 0.3
Pay down of maturing notes	**(2.1)**	(6.0)	(4.3)

Managed Loans

After securitization of credit card receivables, the Company continues to maintain credit card customer account relationships and provides servicing for receivables transferred to the trusts. As a result, the Company considers the securitized credit card receivables to be part of the business it manages. As Citigroup consolidates the credit card trusts, all managed securitized card receivables are on-balance sheet.

Funding, Liquidity Facilities and Subordinated Interests

As noted above, Citigroup securitizes credit card receivables through two securitization trusts—Master Trust and Omni Trust. The liabilities of the trusts are included on the Consolidated Balance Sheet, excluding those retained by Citigroup.

Master Trust Liabilities (at Par Value)

The Master Trust issues fixed- and floating-rate term notes. Some of the term notes may be issued to multi-seller commercial paper conduits. The weighted average maturity of the third-party term notes issued by the Master Trust was 3.5 years as of December 31, 2022 and 3.6 years as of December 31, 2021.

In billions of dollars	**Dec. 31, 2022**	Dec. 31, 2021
Term notes issued to third parties	$ **6.3**	$ 8.4
Term notes retained by Citigroup affiliates	**1.6**	2.2
Total Master Trust liabilities	$ **7.9**	$ 10.6

Omni Trust Liabilities (at Par Value)

The Omni Trust issues fixed- and floating-rate term notes, some of which are purchased by multi-seller commercial paper conduits. The weighted average maturity of the third-party term notes issued by the Omni Trust was 2.2 years as of December 31, 2022 and 1.6 years as of December 31, 2021.

In billions of dollars	**Dec. 31, 2022**	Dec. 31, 2021
Term notes issued to third parties	$ **1.6**	$ 1.3
Term notes retained by Citigroup affiliates	**4.8**	5.0
Total Omni Trust liabilities	$ **6.4**	$ 6.3

Mortgage Securitizations

Citigroup provides a wide range of mortgage loan products to a diverse customer base. Once originated, the Company often securitizes these loans through the use of VIEs. These VIEs are funded through the issuance of trust certificates backed solely by the transferred assets. These certificates have the same life as the transferred assets. In addition to providing a source of liquidity and less expensive funding, securitizing these assets also reduces Citi's credit exposure to the borrowers. These mortgage loan securitizations are primarily non-recourse, thereby effectively transferring the risk of future credit losses to the purchasers of the securities issued by the trust.

Citi's U.S. consumer mortgage business generally retains the servicing rights and in certain instances retains investment securities, interest-only strips and residual interests in future cash flows from the trusts and also provides servicing for a limited number of *ICG* securitizations. Citi's *ICG* business may hold investment securities pursuant to credit risk retention rules or in connection with secondary market-making activities.

The Company securitizes mortgage loans generally through either a U.S. government-sponsored agency, such as Ginnie Mae, Fannie Mae or Freddie Mac (U.S. agency-sponsored mortgages), or private label (non-agency-sponsored mortgages) securitization. Citi is not the primary beneficiary of its U.S. agency-sponsored mortgage securitization entities because Citigroup does not have the power to direct the activities of the VIEs that most significantly impact the entities' economic performance. Therefore, Citi does not consolidate these U.S. agency-sponsored mortgage securitization entities. Substantially all of the consumer loans sold or securitized through non-consolidated trusts by Citigroup are U.S. prime residential mortgage loans. Retained interests in non-consolidated agency-sponsored mortgage securitization trusts are classified as *Trading account assets*, except for MSRs, which are included in *Other assets* on Citigroup's Consolidated Balance Sheet.

Citigroup does not consolidate certain non-agency-sponsored mortgage securitization entities because Citi is either not the servicer with the power to direct the significant activities of the entity or Citi is the servicer, but the servicing relationship is deemed to be a fiduciary relationship; therefore, Citi is not deemed to be the primary beneficiary of the entity.

In certain instances, the Company has (i) the power to direct the activities that most significantly impact the entities' economic performance and (ii) the obligation to either absorb losses or the right to receive benefits that could be potentially significant to its non-agency-sponsored mortgage securitization entities and, therefore, is the primary beneficiary and, thus, consolidates the VIE.

The following tables summarize selected cash flow information and retained interests related to Citigroup mortgage securitizations:

	2022		2021		2020	
In billions of dollars	U.S. agency-sponsored mortgages	Non-agency-sponsored mortgages	U.S. agency-sponsored mortgages	Non-agency-sponsored mortgages	U.S. agency-sponsored mortgages	Non-agency-sponsored mortgages
Principal securitized	$ 6.9	$ 13.9	$ 6.1	$ 25.2	$ 9.4	$ 11.3
Proceeds from new securitizations	6.7	13.4	6.4	25.4	10.0	11.4
Contractual servicing fees received	0.1	—	0.1	—	0.1	—
Cash flows received on retained interests and other net cash flows	—	0.2	—	0.1	—	—
Purchases of previously transferred financial assets	0.1	—	0.2	—	0.4	—

Note: Excludes re-securitization transactions.

For non-consolidated mortgage securitization entities where the transfer of loans to the VIE meets the conditions for sale accounting, Citi recognizes a gain or loss based on the difference between the carrying value of the transferred assets and the proceeds received (generally cash but may be beneficial interests or servicing rights).

Agency and non-agency securitization gains for the year ended December 31, 2022 were $1.3 million and $154.8 million, respectively.

Agency and non-agency securitization gains for the year ended December 31, 2021 were $3.9 million and $493.4 million, respectively, and $88.4 million and $139.4 million, respectively, for the year ended December 31, 2020.

	2022			2021		
		Non-agency-sponsored mortgages[1]			Non-agency-sponsored mortgages[1]	
In millions of dollars	U.S. agency-sponsored mortgages	Senior interests[2]	Subordinated interests	U.S. agency-sponsored mortgages	Senior interests	Subordinated interests
Carrying value of retained interests[3]	$ 659	$ 1,119	$ 943	$ 374	$ 1,452	$ 955

(1) Disclosure of non-agency-sponsored mortgages as senior and subordinated interests is indicative of the interests' position in the capital structure of the securitization.
(2) Senior interests in non-agency-sponsored mortgages include $28 million related to personal loan securitizations at December 31, 2022.
(3) Retained interests consist of Level 2 and Level 3 assets depending on the observability of significant inputs. See Note 25 for more information about fair value measurements.

Key assumptions used in measuring the fair value of retained interests at the date of sale or securitization of mortgage receivables were as follows:

	December 31, 2022		
		Non-agency-sponsored mortgages[1]	
	U.S. agency-sponsored mortgages	Senior interests	Subordinated interests
Weighted average discount rate	8.8%	3.2 %	4.1 %
Weighted average constant prepayment rate	2.7%	6.0 %	11.4 %
Weighted average anticipated net credit losses[2]	NM	2.0 %	0.4 %
Weighted average life	9.0 years	5.5 years	5.6 years

	December 31, 2021		
		Non-agency-sponsored mortgages[1]	
	U.S. agency-sponsored mortgages	Senior interests	Subordinated interests
Weighted average discount rate	8.7%	2.2 %	2.8 %
Weighted average constant prepayment rate	5.5%	6.3 %	11.0 %
Weighted average anticipated net credit losses[2]	NM	1.8 %	1.0 %
Weighted average life	7.4 years	3.9 years	5.4 years

(1) Disclosure of non-agency-sponsored mortgages as senior and subordinated interests is indicative of the interests' position in the capital structure of the securitization.
(2) Anticipated net credit losses represent estimated loss severity associated with defaulted mortgage loans underlying the mortgage securitizations disclosed above. Anticipated net credit losses, in this instance, do not represent total credit losses incurred to date, nor do they represent credit losses expected on retained interests in mortgage securitizations.
NM Anticipated net credit losses are not meaningful due to U.S. agency guarantees.

The interests retained by the Company range from highly rated and/or senior in the capital structure to unrated and/or residual interests. Key assumptions used in measuring the fair value of retained interests in securitizations of mortgage receivables at period end were as follows:

	December 31, 2022		
		Non-agency-sponsored mortgages[1]	
	U.S. agency-sponsored mortgages	Senior interests	Subordinated interests
Weighted average discount rate	5.3%	13.8%	NM
Weighted average constant prepayment rate	5.8%	4.0%	NM
Weighted average anticipated net credit losses[2]	NM	1.0%	NM
Weighted average life	7.7 years	10.3 years	NM

	December 31, 2021		
		Non-agency-sponsored mortgages[1]	
	U.S. agency-sponsored mortgages	Senior interests	Subordinated interests
Weighted average discount rate	3.7%	16.2%	4.0%
Weighted average constant prepayment rate	14.5%	6.8%	9.0%
Weighted average anticipated net credit losses[2]	NM	1.0%	2.0%
Weighted average life	5.1 years	8.8 years	18.0 years

(1) Disclosure of non-agency-sponsored mortgages as senior and subordinated interests is indicative of the interests' position in the capital structure of the securitization.

(2) Anticipated net credit losses represent estimated loss severity associated with defaulted mortgage loans underlying the mortgage securitizations disclosed above. Anticipated net credit losses, in this instance, do not represent total credit losses incurred to date, nor do they represent credit losses expected on retained interests in mortgage securitizations.

NM Anticipated net credit losses are not meaningful due to U.S. agency guarantees.

The sensitivity of the fair value to adverse changes of 10% and 20% in each of the key assumptions is presented in the tables below. The negative effect of each change is calculated independently, holding all other assumptions constant. Because the key assumptions may not be independent, the net effect of simultaneous adverse changes in the key assumptions may be less than the sum of the individual effects shown below.

	December 31, 2022		
		Non-agency-sponsored mortgages	
In millions of dollars	**U.S. agency-sponsored mortgages**	**Senior interests**	**Subordinated interests**
Discount rate			
Adverse change of 10%	**$ (19)**	**$ —**	**$ —**
Adverse change of 20%	**(37)**	**—**	**—**
Constant prepayment rate			
Adverse change of 10%	**(15)**	**—**	**—**
Adverse change of 20%	**(30)**	**—**	**—**
Anticipated net credit losses			
Adverse change of 10%	**NM**	**—**	**—**
Adverse change of 20%	**NM**	**—**	**—**

	December 31, 2021		
		Non-agency-sponsored mortgages	
In millions of dollars	U.S. agency-sponsored mortgages	Senior interests	Subordinated interests
Discount rate			
Adverse change of 10%	$ (6)	$ (1)	$ —
Adverse change of 20%	(11)	(1)	—
Constant prepayment rate			
Adverse change of 10%	(19)	—	—
Adverse change of 20%	(37)	—	—
Anticipated net credit losses			
Adverse change of 10%	NM	—	—
Adverse change of 20%	NM	—	—

NM Anticipated net credit losses are not meaningful due to U.S. agency guarantees.

The following table includes information about loan delinquencies and liquidation losses for assets held in non-consolidated, non-agency-sponsored securitization entities at December 31:

	Securitized assets		90 days past due		Liquidation losses	
In billions of dollars, except liquidation losses in millions	**2022**	2021	**2022**	2021	**2022**	2021
Securitized assets						
Residential mortgages[1]	**$ 30.8**	$ 29.2	**$ 0.5**	$ 0.4	**$ 2.9**	$ 10.6
Commercial and other	**28.8**	26.2	**—**	—	**—**	—
Total	**$ 59.6**	$ 55.4	**$ 0.5**	$ 0.4	**$ 2.9**	$ 10.6

(1) Securitized assets include $0.1 billion of personal loan securitizations as of December 31, 2022.

Mortgage Servicing Rights (MSRs)

In connection with the securitization of mortgage loans, Citi's U.S. consumer mortgage business generally retains the servicing rights, which entitle the Company to a future stream of cash flows based on the outstanding principal balances of the loans and the contractual servicing fee. Failure to service the loans in accordance with contractual requirements may lead to a termination of the servicing rights and the loss of future servicing fees.

These transactions create intangible assets referred to as MSRs, which are recorded at fair value on Citi's Consolidated Balance Sheet. The fair value of Citi's capitalized MSRs was $665 million and $404 million at December 31, 2022 and 2021, respectively. The MSRs correspond to principal loan balances of $51 billion and $47 billion as of December 31, 2022 and 2021, respectively.

The following table summarizes the changes in capitalized MSRs:

In millions of dollars	2022	2021
Balance, beginning of year	**$ 404**	$ 336
Originations	**120**	92
Changes in fair value of MSRs due to changes in inputs and assumptions	**201**	43
Other changes[1]	**(60)**	(67)
Sales of MSRs	**—**	—
Balance, as of December 31	**$ 665**	$ 404

(1) Represents changes due to customer payments and passage of time.

The fair value of the MSRs is primarily affected by changes in prepayments of mortgages that result from shifts in mortgage interest rates. Specifically, higher interest rates tend to lead to declining prepayments, which causes the fair value of the MSRs to increase. In managing this risk, Citigroup economically hedges a significant portion of the value of its MSRs through the use of interest rate derivative contracts, forward purchase and sale commitments of mortgage-backed securities and purchased securities, all classified as *Trading account assets*.

The Company receives fees during the course of servicing previously securitized mortgages. The amounts of these fees were as follows:

In millions of dollars	2022	2021	2020
Servicing fees	**$ 122**	$ 131	$ 142
Late fees	**4**	3	5
Total MSR fees	**$ 126**	$ 134	$ 147

In the Consolidated Statement of Income these fees are primarily classified as *Commissions and fees*, and changes in MSR fair values are classified as *Other revenue*.

Re-securitizations

The Company engages in re-securitization transactions in which debt securities are transferred to a VIE in exchange for new beneficial interests. Citi did not transfer non-agency (private label) securities to re-securitization entities during the years ended December 31, 2022 and 2021. These securities are backed by either residential or commercial mortgages and are often structured on behalf of clients.

As of December 31, 2022 and 2021, Citi held no retained interests in private label re-securitization transactions structured by Citi.

The Company also re-securitizes U.S. government-agency-guaranteed mortgage-backed (agency) securities. During the years ended December 31, 2022 and 2021, Citi transferred agency securities with a fair value of approximately $24.1 billion and $46.6 billion, respectively, to re-securitization entities.

As of December 31, 2022, the fair value of Citi-retained interests in agency re-securitization transactions structured by Citi totaled approximately $1.4 billion (including $802 million related to re-securitization transactions executed in 2022) compared to $1.2 billion as of December 31, 2021 (including $641 million related to re-securitization transactions executed in 2021), which is recorded in *Trading account assets*. The original fair values of agency re-securitization transactions in which Citi holds a retained interest as of December 31, 2022 and 2021 were approximately $79.4 billion and $78.4 billion, respectively.

As of December 31, 2022 and 2021, the Company did not consolidate any private label or agency re-securitization entities.

Citi-Administered Asset-Backed Commercial Paper Conduits

The Company is active in the asset-backed commercial paper conduit business as administrator of several multi-seller commercial paper conduits and also as a service provider to single-seller and other commercial paper conduits sponsored by third parties.

Citi's multi-seller commercial paper conduits are designed to provide the Company's clients access to low-cost funding in the commercial paper markets. The conduits purchase assets from or provide financing facilities to clients and are funded by issuing commercial paper to third-party investors. The conduits generally do not purchase assets originated by Citi. The funding of the conduits is facilitated by the liquidity support and credit enhancements provided by the Company.

As administrator to Citi's conduits, the Company is generally responsible for selecting and structuring assets purchased or financed by the conduits, making decisions regarding the funding of the conduits, including determining the tenor and other features of the commercial paper issued, monitoring the quality and performance of the conduits' assets and facilitating the operations and cash flows of the conduits. In return, the Company earns structuring fees from customers for individual transactions and earns an administration fee from the conduit, which is equal to the income from the client program and liquidity fees of the conduit after payment of conduit expenses. This administration fee is fairly stable, since most risks and rewards of the underlying assets are passed back to the clients. Once the asset pricing is negotiated, most ongoing income, costs and fees are relatively stable as a percentage of the conduit's size.

The conduits administered by Citi do not generally invest in liquid securities that are formally rated by third parties. The

assets are privately negotiated and structured transactions that are generally designed to be held by the conduit, rather than actively traded and sold. The yield earned by the conduit on each asset is generally tied to the rate on the commercial paper issued by the conduit, thus passing interest rate risk to the client. Each asset purchased by the conduit is structured with transaction-specific credit enhancement features provided by the third-party client seller, including over-collateralization, cash and excess spread collateral accounts, direct recourse or third-party guarantees. These credit enhancements are sized with the objective of approximating a credit rating of A or above, based on Citi's internal risk ratings. At December 31, 2022 and 2021, the commercial paper conduits administered by Citi had approximately $19.6 billion and $14 billion of purchased assets outstanding, respectively, and had incremental funding commitments with clients of approximately $13.9 billion and $18.3 billion, respectively.

Substantially all of the funding of the conduits is in the form of short-term commercial paper. At December 31, 2022 and 2021, the weighted average remaining lives of the commercial paper issued by the conduits were approximately 64 and 70 days, respectively.

The primary credit enhancement provided to the conduit investors is in the form of transaction-specific credit enhancements described above. Each asset purchased by the conduit is structured with transaction-specific credit enhancement features provided by the third-party client seller, including over-collateralization, cash and excess spread collateral accounts, direct recourse or third-party guarantees. These credit enhancements are sized with the objective of approximating a credit rating of A or above, based on Citi's internal risk ratings. In addition to the transaction-specific credit enhancements, the conduits, other than the government-guaranteed loan conduit, have obtained letters of credit from the Company, which equal at least 8% to 10% of the conduit's assets with a minimum of $200 million. The letters of credit provided by the Company to the conduits total approximately $1.9 billion as of December 31, 2022 and $1.3 billion as of December 31, 2021. The net result across multiseller conduits administered by the Company is that, in the event that defaulted assets exceed the transaction-specific credit enhancements described above, any losses in each conduit are allocated first to the Company and then to the commercial paper investors.

Citigroup also provides the conduits with two forms of liquidity agreements that are used to provide funding to the conduits in the event of a market disruption, among other events. Each asset of the conduits is supported by a transaction-specific liquidity facility in the form of an asset purchase agreement (APA). Under the APA, the Company has generally agreed to purchase non-defaulted eligible receivables from the conduit at par. The APA is not designed to provide credit support to the conduit, as it generally does not permit the purchase of defaulted or impaired assets. Any funding under the APA will likely subject the underlying conduit clients to increased interest costs. In addition, the Company provides the conduits with program-wide liquidity in the form of short-term lending commitments. Under these commitments, the Company has agreed to lend to the conduits in the event of a short-term disruption in the commercial paper market, subject to specified conditions. The Company receives fees for providing both types of liquidity agreements and considers these fees to be on fair market terms.

Finally, Citi is one of several named dealers in the commercial paper issued by the conduits and earns a market-based fee for providing such services. Along with third-party dealers, the Company makes a market in the commercial paper and may from time to time fund commercial paper pending sale to a third party. On specific dates with less liquidity in the market, the Company may hold in inventory commercial paper issued by conduits administered by the Company, as well as conduits administered by third parties. Separately, in the normal course of business, Citi purchases commercial paper, including commercial paper issued by Citigroup's conduits. At December 31, 2022 and 2021, the Company owned $8.6 billion and $4.9 billion, respectively, of the commercial paper issued by its administered conduits. The Company's investments were not driven by market illiquidity and the Company is not obligated under any agreement to purchase the commercial paper issued by the conduits.

The asset-backed commercial paper conduits are consolidated by Citi. The Company has determined that, through its roles as administrator and liquidity provider, it has the power to direct the activities that most significantly impact the entities' economic performance. These powers include its ability to structure and approve the assets purchased by the conduits, its ongoing surveillance and credit mitigation activities, its ability to sell or repurchase assets out of the conduits and its liability management. In addition, as a result of all the Company's involvement described above, it was concluded that Citi has an economic interest that could potentially be significant. However, the assets and liabilities of the conduits are separate and apart from those of Citigroup. No assets of any conduit are available to satisfy the creditors of Citigroup or any of its other subsidiaries.

Collateralized Loan Obligations (CLOs)

A collateralized loan obligation (CLO) is a VIE that purchases a portfolio of assets consisting primarily of non-investment grade corporate loans. CLOs issue multiple tranches of debt and equity to investors to fund the asset purchases and pay upfront expenses associated with forming the CLO. A third-party asset manager is contracted by the CLO to purchase the underlying assets from the open market and monitor the credit risk associated with those assets. Over the term of a CLO, the asset manager directs purchases and sales of assets in a manner consistent with the CLO's asset management agreement and indenture. In general, the CLO asset manager will have the power to direct the activities of the entity that most significantly impact the economic performance of the CLO. Investors in a CLO, through their ownership of debt and/or equity in it, can also direct certain activities of the CLO, including removing its asset manager under limited circumstances, optionally redeeming the notes, voting on amendments to the CLO's operating documents and other activities. A CLO has a finite life, typically 12 years.

Citi serves as a structuring and placement agent with respect to the CLOs. Typically, the debt and equity of the CLOs are sold to third-party investors. On occasion, certain Citi entities may purchase some portion of a CLO's liabilities

for investment purposes. In addition, Citi may purchase, typically in the secondary market, certain securities issued by the CLOs to support its market-making activities.

The Company generally does not have the power to direct the activities that most significantly impact the economic performance of the CLOs, as this power is generally held by a third-party asset manager of the CLO. As such, those CLOs are not consolidated.

The following tables summarize selected cash flow information and retained interests related to Citigroup CLOs:

In billions of dollars	2022	2021	2020
Principal securitized	$ —	$ —	$ 0.1
Proceeds from new securitizations	—	—	0.1
Cash flows received on retained interests and other net cash flows	0.3	1.1	—
Purchases of previously transferred financial assets	—	0.2	—

In millions of dollars	Dec. 31, 2022	Dec. 31, 2021	Dec. 31, 2020
Carrying value of retained interests	$ 681	$ 921	$ 1,611

All of Citi's retained interests were held-to-maturity securities as of December 31, 2022 and 2021.

Asset-Based Financing

The Company provides loans and other forms of financing to VIEs that hold assets. Those loans are subject to the same credit approvals as all other loans originated or purchased by the Company. Financings in the form of debt securities or derivatives are, in most circumstances, reported in *Trading account assets* and accounted for at fair value through earnings. The Company generally does not have the power to direct the activities that most significantly impact these VIEs' economic performance; thus, it does not consolidate them.

The primary types of Citi's asset-based financings, total assets of the unconsolidated VIEs with significant involvement and Citi's maximum exposure to loss are shown below. For Citi to realize the maximum loss, the VIE (borrower) would have to default with no recovery from the assets held by the VIE.

	December 31, 2022	
In millions of dollars	Total unconsolidated VIE assets	Maximum exposure to unconsolidated VIEs
Type		
Commercial and other real estate	$ 43,236	$ 8,806
Corporate loans	23,120	15,077
Other (including investment funds, airlines and shipping)	166,320	27,986
Total	$ 232,676	$ 51,869

	December 31, 2021	
In millions of dollars	Total unconsolidated VIE assets	Maximum exposure to unconsolidated VIEs
Type		
Commercial and other real estate	$ 32,932	$ 7,461
Corporate loans	18,257	12,581
Other (including investment funds, airlines and shipping)	184,358	25,528
Total	$ 235,547	$ 45,570

Municipal Securities Tender Option Bond (TOB) Trusts

Municipal TOB trusts may hold fixed- or floating-rate, taxable or tax-exempt securities issued by state and local governments and municipalities. TOB trusts are typically structured as single-issuer entities whose assets are purchased from either the Company or from other investors in the municipal securities market. TOB trusts finance the purchase of their municipal assets by issuing two classes of certificates: long-dated, floating rate certificates ("Floaters") that are putable pursuant to a liquidity facility and residual interest certificates ("Residuals"). The Floaters are purchased by third-party investors, typically tax-exempt money market funds. The Residuals are purchased by the original owner of the municipal securities that are being financed.

From Citigroup's perspective, there are two types of TOB trusts: customer and non-customer. Customer TOB trusts are those trusts utilized by customers of the Company to finance their securities, generally municipal securities. The Residuals issued by these trusts are purchased by the customer being financed. Non-customer TOB trusts are generally used by the Company to finance its own municipal securities investments; the Residuals issued by non-customer TOB trusts are purchased by the Company.

With respect to both customer and non-customer TOB trusts, Citi may provide remarketing agent services. If Floaters are optionally tendered and the Company, in its role as remarketing agent, is unable to find a new investor to purchase the optionally tendered Floaters within a specified period of time, Citigroup may, but is not obligated to, purchase the tendered Floaters into its own inventory. The level of the Company's inventory of such Floaters fluctuates.

For certain customer TOB trusts, Citi may also serve as a voluntary advance provider. In this capacity, the Company may, but is not obligated to, make loan advances to customer TOB trusts to purchase optionally tendered Floaters that have not otherwise been successfully remarketed to new investors. Such loans are secured by pledged Floaters. As of December 31, 2022, Citi had no outstanding voluntary advances to customer TOB trusts.

For certain non-customer trusts, the Company also provides credit enhancement. At December 31, 2022 and 2021, none of the municipal bonds owned by non-customer TOB trusts were subject to a credit guarantee provided by the Company.

Citigroup also provides liquidity services to many customer and non-customer trusts. If a trust is unwound early due to an event other than a credit event on the underlying municipal bonds, the underlying municipal bonds are sold out of the trust and bond sale proceeds are used to redeem the outstanding trust certificates. If this results in a shortfall between the bond sale proceeds and the redemption price of the tendered Floaters, the Company, pursuant to the liquidity agreement, would be obligated to make a payment to the trust to satisfy that shortfall. For certain customer TOB trusts, Citigroup has also executed a reimbursement agreement with the holder of the Residual, pursuant to which the Residual holder is obligated to reimburse the Company for any payment the Company makes under the liquidity arrangement. These reimbursement agreements may be subject to daily margining based on changes in the market value of the underlying municipal bonds. In cases where a third party provides liquidity to a non-customer TOB trust, a similar reimbursement arrangement may be executed, whereby the Company (or a consolidated subsidiary of the Company), as Residual holder, would absorb any losses incurred by the liquidity provider.

For certain other non-customer TOB trusts, Citi serves as tender option provider. The tender option provider arrangement allows Floater holders to put their interests directly to the Company at any time, subject to the requisite notice period requirements, at a price of par.

At December 31, 2022 and 2021, liquidity agreements provided with respect to customer TOB trusts totaled $1.1 billion and $1.5 billion, respectively, of which $0.7 billion and $0.6 billion, respectively, were offset by reimbursement agreements. For the remaining exposure related to TOB transactions, where the residual owned by the customer was at least 25% of the bond value at the inception of the transaction, no reimbursement agreement was executed.

Citi considers both customer and non-customer TOB trusts to be VIEs. Customer TOB trusts are not consolidated by the Company, as the power to direct the activities that most significantly impact the trust's economic performance rests with the customer Residual holder, which may unilaterally cause the sale of the trust's bonds.

Non-customer TOB trusts generally are consolidated because the Company holds the Residual interest and thus has the unilateral power to cause the sale of the trust's bonds.

The Company also provides other liquidity agreements or letters of credit to customer-sponsored municipal investment funds, which are not variable interest entities, and municipality-related issuers that totaled $1.4 billion as of December 31, 2022 and $2 billion as of December 31, 2021. These liquidity agreements and letters of credit are offset by reimbursement agreements with various term-out provisions.

Municipal Investments

Municipal investment transactions include debt and equity interests in partnerships that finance the construction and rehabilitation of low-income housing, facilitate lending in new or underserved markets or finance the construction or operation of renewable municipal energy facilities. Citi generally invests in these partnerships as a limited partner and earns a return primarily through the receipt of tax credits and grants earned from the investments made by the partnership. The Company may also provide construction loans or permanent loans for the development or operation of real estate properties held by partnerships. These entities are generally considered VIEs. The power to direct the activities of these entities is typically held by the general partner. Accordingly, these entities are not consolidated by Citigroup.

Client Intermediation

Client intermediation transactions represent a range of transactions designed to provide investors with specified returns based on the returns of an underlying security, referenced asset or index. These transactions include credit-linked notes and equity-linked notes. In these transactions, the VIE typically obtains exposure to the underlying security, referenced asset or index through a derivative instrument, such as a total-return swap or a credit-default swap. In turn, the VIE issues notes to investors that pay a return based on the specified underlying security, referenced asset or index. The VIE invests the proceeds in a financial asset or a guaranteed insurance contract that serves as collateral for the derivative contract over the term of the transaction. The Company's involvement in these transactions includes being the counterparty to the VIE's derivative instruments and investing in a portion of the notes issued by the VIE. In certain transactions, the investor's maximum risk of loss is limited and the Company absorbs risk of loss above a specified level. Citi does not have the power to direct the activities of the VIEs that most significantly impact their economic performance and thus it does not consolidate them.

Citi's maximum risk of loss in these transactions is defined as the amount invested in notes issued by the VIE and the notional amount of any risk of loss absorbed by Citi through a separate instrument issued by the VIE. The derivative instrument held by the Company may generate a receivable from the VIE (e.g., where the Company purchases credit protection from the VIE in connection with the VIE's issuance of a credit-linked note), which is collateralized by the assets owned by the VIE. These derivative instruments are not considered variable interests and any associated receivables are not included in the calculation of maximum exposure to the VIE.

Investment Funds

The Company is the investment manager for certain investment funds and retirement funds that invest in various asset classes including private equity, hedge funds, real estate, fixed income and infrastructure. Citigroup earns a management fee, which is a percentage of capital under management, and may earn performance fees. In addition, for some of these funds the Company has an ownership interest in the investment funds. Citi has also established a number of investment funds as opportunities for qualified employees to invest in private equity investments. The Company acts as investment manager for these funds and may provide employees with financing on both recourse and non-recourse bases for a portion of the employees' investment commitments.

23. DERIVATIVES

In the ordinary course of business, Citigroup enters into various types of derivative transactions, which include:

- *Futures and forward contracts*, which are commitments to buy or sell at a future date a financial instrument, commodity or currency at a contracted price that may be settled in cash or through delivery of an item readily convertible to cash.
- *Swap contracts*, which are commitments to settle in cash at a future date or dates that may range from a few days to a number of years, based on differentials between specified indices or financial instruments, as applied to a notional principal amount.
- *Option contracts*, which give the purchaser, for a premium, the right, but not the obligation, to buy or sell within a specified time a financial instrument, commodity or currency at a contracted price that may also be settled in cash, based on differentials between specified indices or prices.

Swaps, forwards and some option contracts are over-the-counter (OTC) derivatives that are bilaterally negotiated with counterparties and settled with those counterparties, except for swap contracts that are novated and "cleared" through central counterparties (CCPs). Futures contracts and other option contracts are standardized contracts that are traded on an exchange with a CCP as the counterparty from the inception of the transaction. Citigroup enters into derivative contracts relating to interest rate, foreign currency, commodity and other market/credit risks for the following reasons:

- *Trading Purposes*: Citigroup trades derivatives as an active market maker. Citigroup offers its customers derivatives in connection with their risk management actions to transfer, modify or reduce their interest rate, foreign exchange and other market/credit risks or for their own trading purposes. Citigroup also manages its derivative risk positions through offsetting trade activities, controls focused on price verification and daily reporting of positions to senior managers.
- *Hedging*: Citigroup uses derivatives in connection with its own risk management activities to hedge certain risks or reposition the risk profile of the Company. Hedging may be accomplished by applying hedge accounting in accordance with ASC 815, *Derivatives and Hedging*. For example, Citigroup issues fixed-rate long-term debt and then enters into a receive-fixed, pay-variable-rate interest rate swap with the same tenor and notional amount to synthetically convert the interest payments to a net variable-rate basis. This strategy is the most common form of an interest rate hedge, as it minimizes net interest cost in certain yield curve environments. Derivatives are also used to manage market risks inherent in specific groups of on-balance sheet assets and liabilities, including AFS securities, commodities and borrowings, as well as other interest-sensitive assets and liabilities. In addition, foreign exchange contracts are used to hedge non-U.S.-dollar-denominated debt, foreign currency-denominated AFS securities and net investment exposures.

Derivatives may expose Citigroup to market, credit or liquidity risks in excess of the amounts recorded on the Consolidated Balance Sheet. Market risk on a derivative product is the exposure created by potential fluctuations in interest rates, market prices, foreign exchange rates and other factors and is a function of the type of product, the volume of transactions, the tenor and terms of the agreement and the underlying volatility. Credit risk is the exposure to loss in the event of nonperformance by the other party to satisfy a derivative liability where the value of any collateral held by Citi is not adequate to cover such losses. The recognition in earnings of unrealized gains on derivative transactions is subject to management's assessment of the probability of counterparty default. Liquidity risk is the potential exposure that arises when the size of a derivative position may affect the ability to monetize the position in a reasonable period of time and at a reasonable cost in periods of high volatility and financial stress.

Derivative transactions are customarily documented under industry standard master netting agreements, which provide that following an event of default, the non-defaulting party may promptly terminate all transactions between the parties and determine the net amount due to be paid to, or by, the defaulting party. Events of default include (i) failure to make a payment on a derivative transaction that remains uncured following applicable notice and grace periods, (ii) breach of agreement that remains uncured after applicable notice and grace periods, (iii) breach of a representation, (iv) cross default, either to third-party debt or to other derivative transactions entered into between the parties, or, in some cases, their affiliates, (v) the occurrence of a merger or consolidation that results in the creditworthiness of a party becoming materially weaker and (vi) the cessation or repudiation of any applicable guarantee or other credit support document. Obligations under master netting agreements are often secured by collateral posted under an industry standard credit support annex to the master netting agreement. An event of default may also occur under a credit support annex if a party fails to make a collateral delivery that remains uncured following applicable notice and grace periods.

The netting and collateral rights incorporated in the master netting agreements are considered to be legally enforceable if a supportive legal opinion has been obtained from counsel of recognized standing that provides (i) the requisite level of certainty regarding enforceability and (ii) that the exercise of rights by the non-defaulting party to terminate and close-out transactions on a net basis under these agreements will not be stayed or avoided under applicable law upon an event of default, including bankruptcy, insolvency or similar proceeding.

A legal opinion may not be sought for certain jurisdictions where local law is silent or unclear as to the enforceability of such rights or where adverse case law or conflicting regulation may cast doubt on the enforceability of such rights. In some jurisdictions and for some counterparty types, the insolvency law may not provide the requisite level of certainty. For example, this may be the case for certain sovereigns, municipalities, central banks and U.S. pension plans.

Exposure to credit risk on derivatives is affected by market volatility, which may impair the ability of counterparties to satisfy their obligations to the Company. Credit limits are established and closely monitored for customers engaged in derivatives transactions. Citi considers the level of legal certainty regarding enforceability of its offsetting rights under master netting agreements and credit support annexes to be an important factor in its risk management process. Specifically, Citi generally transacts much lower volumes of derivatives under master netting agreements where Citi does not have the requisite level of legal certainty regarding enforceability, because such derivatives consume greater amounts of single counterparty credit limits than those executed under enforceable master netting agreements.

Cash collateral and security collateral in the form of G10 government debt securities are often posted by a party to a master netting agreement to secure the net open exposure of the other party; the receiving party is free to commingle/ rehypothecate such collateral in the ordinary course of its business. Nonstandard collateral such as corporate bonds, municipal bonds, U.S. agency securities and/or MBS may also be pledged as collateral for derivative transactions. Security collateral posted to open and maintain a master netting agreement with a counterparty, in the form of cash and/or securities, may from time to time be segregated in an account at a third-party custodian pursuant to a tri-party account control agreement.

Information pertaining to Citigroup's derivatives activities, based on notional amounts, is presented in the table below. Derivative notional amounts are reference amounts from which contractual payments are derived and do not represent a complete measure of Citi's exposure to derivative transactions. Citi's derivative exposure arises primarily from market fluctuations (i.e., market risk), counterparty failure (i.e., credit risk) and/or periods of high volatility or financial stress (i.e., liquidity risk), as well as any market valuation adjustments that may be required on the transactions. Moreover, notional amounts do not reflect the netting of offsetting trades. For example, if Citi enters into a receive-fixed interest rate swap with $100 million notional, and offsets this risk with an identical but opposite pay-fixed position with a different counterparty, $200 million in derivative notionals is reported, although these offsetting positions may result in de minimis overall market risk.

In addition, aggregate derivative notional amounts can fluctuate from period to period in the normal course of business based on Citi's market share, levels of client activity and other factors. All derivatives are recorded in *Trading account assets/Trading account liabilities* on the Consolidated Balance Sheet.

Derivative Notionals

In millions of dollars	Hedging instruments under ASC 815		Trading derivative instruments	
	December 31, 2022	December 31, 2021	**December 31, 2022**	December 31, 2021
Interest rate contracts				
Swaps	$ **255,280**	$ 267,035	$ **23,780,711**	$ 21,873,538
Futures and forwards	**—**	—	**2,966,025**	2,383,702
Written options	**—**	—	**1,937,025**	1,584,451
Purchased options	**—**	—	**1,881,291**	1,428,376
Total interest rate contracts	$ **255,280**	$ 267,035	$ **30,565,052**	$ 27,270,067
Foreign exchange contracts				
Swaps	$ **48,678**	$ 47,298	$ **6,746,070**	$ 6,288,193
Futures, forwards and spot	**43,666**	50,926	**3,350,341**	4,316,242
Written options	**—**	—	**789,077**	664,942
Purchased options	**—**	—	**783,591**	651,958
Total foreign exchange contracts	$ **92,344**	$ 98,224	$ **11,669,079**	$ 11,921,335
Equity contracts				
Swaps	$ **—**	$ —	$ **266,115**	$ 269,062
Futures and forwards	**—**	—	**76,935**	71,363
Written options	**—**	—	**482,266**	492,433
Purchased options	**—**	—	**387,766**	398,129
Total equity contracts	$ **—**	$ —	$ **1,213,082**	$ 1,230,987
Commodity and other contracts				
Swaps	$ **—**	$ —	$ **90,884**	$ 91,962
Futures and forwards	**1,571**	2,096	**165,314**	157,195
Written options	**—**	—	**45,862**	51,224
Purchased options	**—**	—	**48,197**	47,868
Total commodity and other contracts	$ **1,571**	$ 2,096	$ **350,257**	$ 348,249
Credit derivatives[1]				
Protection sold	$ **—**	$ —	$ **593,136**	$ 572,486
Protection purchased	**—**	—	**641,639**	645,996
Total credit derivatives	$ **—**	$ —	$ **1,234,775**	$ 1,218,482
Total derivative notionals	$ **349,195**	$ 367,355	$ **45,032,245**	$ 41,989,120

(1) Credit derivatives are arrangements designed to allow one party (protection purchaser) to transfer the credit risk of a "reference asset" to another party (protection seller). These arrangements allow a protection seller to assume the credit risk associated with the reference asset without directly purchasing that asset. The Company enters into credit derivative positions for purposes such as risk management, yield enhancement, reduction of credit concentrations and diversification of overall risk.

The following tables present the gross and net fair values of the Company's derivative transactions and the related offsetting amounts as of December 31, 2022 and 2021. Gross positive fair values are offset against gross negative fair values by counterparty, pursuant to enforceable master netting agreements. Under ASC 815-10-45, payables and receivables in respect of cash collateral received from or paid to a given counterparty pursuant to a credit support annex are included in the offsetting amount if a legal opinion supporting the enforceability of netting and collateral rights has been obtained. GAAP does not permit similar offsetting for security collateral.

In addition, the following tables reflect rule changes adopted by clearing organizations that require or allow entities to treat certain derivative assets, liabilities and the related variation margin as settlement of the related derivative fair values for legal and accounting purposes, as opposed to presenting gross derivative assets and liabilities that are subject to collateral, whereby the counterparties would also record a related collateral payable or receivable. The tables also present amounts that are not permitted to be offset, such as security collateral or cash collateral posted at third-party custodians, but which would be eligible for offsetting to the extent that an event of default has occurred and a legal opinion supporting enforceability of the netting and collateral rights has been obtained.

Derivative Mark-to-Market (MTM) Receivables/Payables

In millions of dollars at December 31, 2022	Derivatives classified in Trading account assets/liabilities[1][2]	
Derivatives instruments designated as ASC 815 hedges	**Assets**	**Liabilities**
Over-the-counter	$ 468	$ 1
Cleared	129	101
Interest rate contracts	$ 597	$ 102
Over-the-counter	$ 2,288	$ 1,766
Cleared	3	3
Foreign exchange contracts	$ 2,291	$ 1,769
Total derivatives instruments designated as ASC 815 hedges	$ 2,888	$ 1,871
Derivatives instruments not designated as ASC 815 hedges		
Over-the-counter	$ 126,844	$ 119,854
Cleared	50,515	52,566
Exchange traded	248	98
Interest rate contracts	$ 177,607	$ 172,518
Over-the-counter	$ 184,869	$ 183,578
Cleared	502	643
Exchange traded	1	5
Foreign exchange contracts	$ 185,372	$ 184,226
Over-the-counter	$ 19,674	$ 21,871
Cleared	1	4
Exchange traded	22,732	21,908
Equity contracts	$ 42,407	$ 43,783
Over-the-counter	$ 27,285	$ 24,912
Exchange traded	1,039	1,406
Commodity and other contracts	$ 28,324	$ 26,318
Over-the-counter	$ 6,836	$ 5,807
Cleared	1,553	1,970
Credit derivatives	$ 8,389	$ 7,777
Total derivatives instruments not designated as ASC 815 hedges	$ 442,099	$ 434,622
Total derivatives	$ 444,987	$ 436,493
Less: Netting agreements[3]	$ (346,545)	$ (346,545)
Less: Netting cash collateral received/paid[4]	(23,136)	(30,032)
Net receivables/payables included on the Consolidated Balance Sheet[5]	$ 75,306	$ 59,916
Additional amounts subject to an enforceable master netting agreement, but not offset on the Consolidated Balance Sheet		
Less: Cash collateral received/paid	$ (1,455)	$ (2,272)
Less: Non-cash collateral received/paid	(5,923)	(13,475)
Total net receivables/payables[5]	$ 67,928	$ 44,169

(1) The derivatives fair values are also presented in Note 25.

(2) Over-the-counter (OTC) derivatives are derivatives executed and settled bilaterally with counterparties without the use of an organized exchange or central clearing house. Cleared derivatives include derivatives executed bilaterally with a counterparty in the OTC market, but then novated to a central clearing house, whereby the central clearing house becomes the counterparty to both of the original counterparties. Exchange-traded derivatives include derivatives executed directly on an organized exchange that provides pre-trade price transparency.

(3) Represents the netting of balances with the same counterparty under enforceable netting agreements. Approximately $276 billion, $49 billion and $22 billion of the netting against trading account asset/liability balances is attributable to each of the OTC, cleared and exchange-traded derivatives, respectively.

(4) Represents the netting of cash collateral paid and received by counterparties under enforceable credit support agreements. Substantially all netting of cash collateral received and paid is against OTC derivative assets and liabilities, respectively.

(5) The net receivables/payables include approximately $14 billion of derivative asset and $11 billion of derivative liability fair values not subject to enforceable master netting agreements, respectively.

In millions of dollars at December 31, 2021	Derivatives classified in Trading account assets/liabilities[1][2]	
Derivatives instruments designated as ASC 815 hedges	Assets	Liabilities
Over-the-counter	$ 1,167	$ 6
Cleared	122	89
Interest rate contracts	$ 1,289	$ 95
Over-the-counter	$ 1,338	$ 1,472
Cleared	6	—
Foreign exchange contracts	$ 1,344	$ 1,472
Total derivatives instruments designated as ASC 815 hedges	$ 2,633	$ 1,567
Derivatives instruments not designated as ASC 815 hedges		
Over-the-counter	$ 152,524	$ 138,114
Cleared	11,579	11,821
Exchange traded	96	44
Interest rate contracts	$ 164,199	$ 149,979
Over-the-counter	$ 133,357	$ 133,548
Cleared	848	278
Foreign exchange contracts	$ 134,205	$ 133,826
Over-the-counter	$ 23,452	$ 28,352
Cleared	19	—
Exchange traded	21,781	21,332
Equity contracts	$ 45,252	$ 49,684
Over-the-counter	$ 29,279	$ 29,833
Exchange traded	1,065	1,546
Commodity and other contracts	$ 30,344	$ 31,379
Over-the-counter	$ 6,896	$ 6,959
Cleared	3,322	4,056
Credit derivatives	$ 10,218	$ 11,015
Total derivatives instruments not designated as ASC 815 hedges	$ 384,218	$ 375,883
Total derivatives	$ 386,851	$ 377,450
Less: Netting agreements[3]	$ (292,628)	$ (292,628)
Less: Netting cash collateral received/paid[4]	(24,447)	(29,306)
Net receivables/payables included on the Consolidated Balance Sheet[5]	$ 69,776	$ 55,516
Additional amounts subject to an enforceable master netting agreement, but not offset on the Consolidated Balance Sheet		
Less: Cash collateral received/paid	$ (907)	$ (538)
Less: Non-cash collateral received/paid	(5,777)	(13,607)
Total net receivables/payables[5]	$ 63,092	$ 41,371

(1) The derivative fair values are also presented in Note 25.

(2) Over-the-counter (OTC) derivatives are derivatives executed and settled bilaterally with counterparties without the use of an organized exchange or central clearing house. Cleared derivatives include derivatives executed bilaterally with a counterparty in the OTC market, but then novated to a central clearing house, whereby the central clearing house becomes the counterparty to both of the original counterparties. Exchange-traded derivatives include derivatives executed directly on an organized exchange that provides pre-trade price transparency.

(3) Represents the netting of balances with the same counterparty under enforceable netting agreements. Approximately $259 billion, $14 billion and $20 billion of the netting against trading account asset/liability balances is attributable to each of the OTC, cleared and exchange-traded derivatives, respectively.

(4) Represents the netting of cash collateral paid and received by counterparties under enforceable credit support agreements. Substantially all netting of cash collateral received and paid is against OTC derivative assets and liabilities, respectively.

(5) The net receivables/payables include approximately $10 billion of derivative asset and $11 billion of derivative liability fair values not subject to enforceable master netting agreements, respectively.

For the years ended December 31, 2022, 2021 and 2020, amounts recognized in *Principal transactions* in the Consolidated Statement of Income include certain derivatives not designated in a qualifying hedging relationship. Citigroup presents this disclosure by business classification, showing derivative gains and losses related to its trading activities together with gains and losses related to non-derivative instruments within the same trading portfolios, as this represents how these portfolios are risk managed. See Note 6 for further information.

The amounts recognized in *Other revenue* in the Consolidated Statement of Income related to derivatives not designated in a qualifying hedging relationship are shown below. The table below does not include any offsetting gains (losses) on the economically hedged items to the extent that such amounts are also recorded in *Other revenue*:

	Gains (losses) included in Other revenue		
	Year ended December 31,		
In millions of dollars	2022	2021	2020
Interest rate contracts	$ 141	$ (70)	$ 63
Foreign exchange	(56)	(102)	(57)
Total	$ 85	$ (172)	$ 6

Accounting for Derivative Hedging

Citigroup accounts for its hedging activities in accordance with ASC 815, *Derivatives and Hedging*. As a general rule, hedge accounting is permitted where the Company is exposed to a particular risk, such as interest rate or foreign exchange risk, that causes changes in the fair value of an asset or liability or variability in the expected future cash flows of an existing asset, liability or a forecasted transaction that may affect earnings.

Derivative contracts hedging the risks associated with changes in fair value are referred to as fair value hedges, while contracts hedging the variability of expected future cash flows are cash flow hedges. Hedges that utilize derivatives or debt instruments to manage the foreign exchange risk associated with equity investments in non-U.S.-dollar-functional-currency foreign subsidiaries (i.e., net investment in a foreign operation) are net investment hedges.

To qualify as an accounting hedge under the hedge accounting rules (versus an economic hedge where hedge accounting is not applied), a hedging relationship must be highly effective in offsetting the risk designated as being hedged. The hedging relationship must be formally documented at inception, detailing the particular risk management objective and strategy for the hedge. This includes the item and risk(s) being hedged, the hedging instrument being used and how effectiveness will be assessed. The effectiveness of these hedging relationships is evaluated at hedge inception and on an ongoing basis both on a retrospective and prospective basis, typically using quantitative measures of correlation, with hedge ineffectiveness measured and recorded in current earnings. Hedge effectiveness assessment methodologies are performed in a similar manner for similar hedges, and are used consistently throughout the hedging relationships. The assessment of effectiveness may exclude changes in the value of the hedged item that are unrelated to the risks being hedged and the changes in fair value of the derivative associated with time value. Citi excludes changes in the cross-currency basis associated with cross-currency swaps from the assessment of hedge effectiveness and records it in *Other comprehensive income*.

Discontinued Hedge Accounting

A hedging instrument must be highly effective in accomplishing the hedge objective of offsetting either changes in the fair value or cash flows of the hedged item for the risk being hedged. Management may voluntarily de-designate an accounting hedge at any time, but if a hedging relationship is not highly effective, it no longer qualifies for hedge accounting and must be de-designated. Subsequent changes in the fair value of the derivative are recognized in *Other revenue* or *Principal transactions*, similar to trading derivatives, with no offset recorded related to the hedged item.

For fair value hedges, any changes in the carrying value of the hedged item remain as part of the basis of the asset or liability and are ultimately realized as an element of the yield on the item. For cash flow hedges, changes in fair value of the end-user derivative remain in *Accumulated other comprehensive income (loss) (AOCI)* and are included in the earnings of future periods when the forecasted hedged cash flows impact earnings. However, if it becomes probable that some or all of the hedged forecasted transactions will not occur, any amounts that remain in *AOCI* related to these transactions must be immediately reflected in *Other revenue*.

The foregoing criteria are applied on a decentralized basis, consistent with the level at which market risk is managed, but are subject to various limits and controls. The underlying asset, liability or forecasted transaction may be an individual item or a portfolio of similar items.

Fair Value Hedges

Hedging of Benchmark Interest Rate Risk

Citigroup's fair value hedges, which include hedges of closed pools of assets, are primarily hedges of fixed-rate long-term debt or assets, such as available-for-sale debt securities or loans.

For qualifying fair value hedges of interest rate risk, the changes in the fair value of the derivative and the change in the fair value of the hedged item attributable to the hedged risk are presented within *Interest revenue* or *Interest expense* based on whether the hedged item is an asset or a liability.

Hedging of Foreign Exchange Risk

Citigroup hedges the change in fair value attributable to foreign exchange rate movements in available-for-sale debt securities and long-term debt that are denominated in currencies other than the functional currency of the entity holding the securities or issuing the debt. The hedging instrument is generally a forward foreign exchange contract or a cross-currency swap contract. Changes in the fair value of the forward points (i.e., the spot-forward difference) of forward contracts are excluded from the assessment of hedge effectiveness and are generally reflected directly in earnings over the life of the hedge. Citi also excludes changes in the fair value of cross-currency basis associated with cross-currency swaps from the assessment of hedge effectiveness and records them in *Other comprehensive income.*

Hedging of Commodity Price Risk

Citigroup hedges the change in fair value attributable to spot price movements in physical commodities inventories. The hedging instrument is a futures contract to sell the underlying commodity. In this hedge, the change in the carrying value of the hedged inventory is reflected in earnings, which offsets the change in the fair value of the futures contract that is also reflected in earnings. Although the entire change in the fair value of the hedging instrument is recorded in earnings, under certain hedge programs, Citigroup excludes changes in the fair value of the forward points (i.e., spot-forward difference) of the futures contract from the assessment of hedge effectiveness, and they are generally reflected directly in earnings over the life of the hedge. Under other hedge programs, Citi excludes changes in the fair value of forward points from the assessment of hedge effectiveness and records them in *Other comprehensive income.*

The following table summarizes the gains (losses) on the Company's fair value hedges:

	Gains (losses) on fair value hedges[1]					
	Year ended December 31,					
	2022		2021		2020	
In millions of dollars	Other revenue	Net interest income	Other revenue	Net interest income	Other revenue	Net interest income
Gain (loss) on the hedging derivatives included in assessment of the effectiveness of fair value hedges						
Interest rate hedges	$ —	$ (8,322)	$ —	$ (5,425)	$ —	$ 4,189
Foreign exchange hedges	(1,375)	—	(627)	—	1,442	—
Commodity hedges	(1,870)	—	(3,983)	—	(164)	—
Total gain (loss) on the hedging derivatives included in assessment of the effectiveness of fair value hedges	$ (3,245)	$ (8,322)	$ (4,610)	$ (5,425)	$ 1,278	$ 4,189
Gain (loss) on the hedged item in designated and qualifying fair value hedges						
Interest rate hedges	$ —	$ 8,087	$ —	$ 5,043	$ —	$ (4,537)
Foreign exchange hedges	1,372	—	628	—	(1,442)	—
Commodity hedges	1,870	—	3,973	—	164	—
Total gain (loss) on the hedged item in designated and qualifying fair value hedges	$ 3,242	$ 8,087	$ 4,601	$ 5,043	$ (1,278)	$ (4,537)
Net gain (loss) on the hedging derivatives excluded from assessment of the effectiveness of fair value hedges						
Interest rate hedges	$ —	$ —	$ —	$ (9)	$ —	$ (23)
Foreign exchange hedges[2]	171	—	79	—	(73)	—
Commodity hedges[3]	94	—	5	—	131	—
Total net gain (loss) on the hedging derivatives excluded from assessment of the effectiveness of fair value hedges	$ 265	$ —	$ 84	$ (9)	$ 58	$ (23)

(1) Gain (loss) amounts for interest rate risk hedges are included in *Interest revenue/Interest expense.* The accrued interest income on fair value hedges is recorded in *Net interest income* and is excluded from this table.

(2) Amounts related to the forward points (i.e., the spot-forward difference) that are excluded from the assessment of hedge effectiveness and are generally reflected directly in earnings under the mark-to-market approach. Amounts related to cross-currency basis, which are recognized in *AOCI,* are not reflected in the table above. The amount of cross-currency basis included in *AOCI* was $73 million and $2 million for the years ended December 31, 2022 and 2021, respectively.

(3) Amounts related to the forward points (i.e., the spot-forward difference) that are excluded from the assessment of hedge effectiveness reflected directly in earnings under the mark-to-market approach or recorded in *AOCI* under the amortization approach. The year ended December 31, 2022 includes gain (loss) of approximately $86 million and $8 million under the mark-to-market approach and amortization approach, respectively.

Cumulative Basis Adjustment

Upon electing to apply ASC 815 fair value hedge accounting, the carrying value of the hedged item is adjusted to reflect the cumulative changes in the hedged risk. This cumulative basis adjustment becomes part of the carrying amount of the hedged item until the hedged item is derecognized from the balance sheet. The table below presents the carrying amount of Citi's hedged assets and liabilities under qualifying fair value hedges at December 31, 2022 and 2021, along with the cumulative basis adjustments included in the carrying value of those hedged assets and liabilities that would reverse through earnings in future periods.

In millions of dollars

Balance sheet line item in which hedged item is recorded	Carrying amount of hedged asset/ liability	Cumulative basis adjustment increasing (decreasing) the carrying amount	
		Active	De-designated
As of December 31, 2022			
Debt securities AFS[1][3]	$ 98,837	$ (2,976)	$ (333)
Long-term debt	144,549	(5,040)	(3,399)
As of December 31, 2021			
Debt securities AFS[2][3]	$ 62,733	$ 149	$ 212
Long-term debt	149,305	623	3,936

(1) These amounts include a cumulative basis adjustment of $(91) million for active hedges and $(309) million for de-designated hedges as of December 31, 2022, related to certain prepayable financial assets previously designated as the hedged item in a fair value hedge using the last-of-layer approach. The Company designated approximately $3 billion as the hedged amount (from a closed portfolio of prepayable financial assets with a carrying value of $11 billion as of December 31, 2022) in a last-of-layer hedging relationship.

(2) These amounts include a cumulative basis adjustment of $24 million for active hedges and $(92) million for de-designated hedges as of December 31, 2021, related to certain prepayable financial assets previously designated as the hedged item in a fair value hedge using the last-of-layer approach. The Company designated approximately $6 billion as the hedged amount (from a closed portfolio of prepayable financial assets with a carrying value of $25 billion as of December 31, 2021) in a last-of-layer hedging relationship.

(3) Carrying amount represents the amortized cost.

Cash Flow Hedges

Citigroup hedges the variability of forecasted cash flows due to changes in contractually specified interest rates associated with floating-rate assets/liabilities and other forecasted transactions. Variable cash flows from those liabilities are synthetically converted to fixed-rate cash flows by entering into receive-variable, pay-fixed interest rate swaps and receive-variable, pay-fixed forward-starting interest rate swaps. Variable cash flows associated with certain assets are synthetically converted to fixed-rate cash flows by entering into receive-fixed, pay-variable interest rate swaps. These cash flow hedging relationships use either regression analysis or dollar-offset ratio analysis to assess whether the hedging relationships are highly effective at inception and on an ongoing basis.

For cash flow hedges, the entire change in the fair value of the hedging derivative is recognized in *AOCI* and then reclassified to earnings in the same period that the forecasted hedged cash flows impact earnings. The pretax change in *AOCI* from cash flow hedges is presented below:

In millions of dollars	2022		2021		2020	
Amount of gain (loss) recognized in *AOCI* on derivatives						
Interest rate contracts		$ (3,640)		$ (847)		$ 2,670
Foreign exchange contracts		34		(51)		(15)
Total gain (loss) recognized in *AOCI*		$ (3,606)		$ (898)		$ 2,655
	Other revenue	**Net interest income**	Other revenue	Net interest income	Other revenue	Net interest income
Amount of gain (loss) reclassified from *AOCI* to earnings[1]						
Interest rate contracts	$ —	$ (125)	$ —	$ 1,075	$ —	$ 734
Foreign exchange contracts	(4)	—	(4)	—	(4)	—
Total gain (loss) reclassified from *AOCI* into earnings	$ (4)	$ (125)	$ (4)	$ 1,075	$ (4)	$ 734
Net pretax change in cash flow hedges included within *AOCI*		$ (3,477)		$ (1,969)		$ 1,925

(1) All amounts reclassified into earnings for interest rate contracts are included in *Interest income/Interest expense (Net interest income)*. For all other hedges, the amounts reclassified to earnings are included primarily in *Other revenue* and *Net interest income* in the Consolidated Statement of Income.

The net gain (loss) associated with cash flow hedges expected to be reclassified from *AOCI* within 12 months of December 31, 2022 is approximately $(1.7) billion. The maximum length of time over which forecasted cash flows are hedged is 10 years.

The after-tax impact of cash flow hedges on *AOCI* is shown in Note 20.

Net Investment Hedges

Consistent with ASC 830-20, *Foreign Currency Matters—Foreign Currency Transactions*, ASC 815 allows the hedging of the foreign currency risk of a net investment in a foreign operation. Citigroup uses foreign currency forwards, cross-currency swaps, options and foreign currency-denominated debt instruments to manage the foreign exchange risk associated with Citigroup's equity investments in several non-U.S.-dollar-functional-currency foreign subsidiaries. Citi records the change in the fair value of these hedging instruments and the translation adjustment for the investments in these foreign subsidiaries in *Foreign currency translation adjustment* within *AOCI*.

For derivatives designated as net investment hedges, Citigroup follows the forward-rate method outlined in ASC 815-35-35. According to that method, all changes in fair value, including changes related to the forward-rate component of the foreign currency forward contracts and the time value of foreign currency options, are recorded in *Foreign currency translation adjustment* within *AOCI*.

For foreign currency-denominated debt instruments that are designated as hedges of net investments, the translation gain or loss that is recorded in *Foreign currency translation adjustment* is based on the spot exchange rate between the functional currency of the respective subsidiary and the U.S. dollar, which is the functional currency of Citigroup.

The pretax gain (loss) recorded in Foreign currency translation adjustment within *AOCI*, related to net investment hedges, was $370 million, $855 million and $(600) million for the years ended December 31, 2022, 2021 and 2020, respectively. The year ended December 31, 2022 includes a $36 million pretax loss related to net investment hedges, respectively, which were reclassified from *AOCI* into earnings (recorded in *Other revenue*).

Economic Hedges

Citigroup often uses economic hedges when hedge accounting would be too complex or operationally burdensome. End-user derivatives that are economic hedges are carried at fair value, with changes in value included in either *Principal transactions* or *Other revenue*.

For asset/liability management hedging, fixed-rate long-term debt is recorded at amortized cost under GAAP.

For other hedges that either do not meet the ASC 815 hedging criteria or for which management decides not to apply ASC 815 hedge accounting, the derivative is recorded at fair value on the balance sheet with the associated changes in fair value recorded in earnings, while the debt continues to be carried at amortized cost. Therefore, current earnings are affected by the interest rate shifts and other factors that cause a change in the swap's value, but for which no offsetting change in value is recorded on the debt.

Citigroup may alternatively elect to account for the debt at fair value under the fair value option. Once the irrevocable election is made upon issuance of the debt, the full change in fair value of the debt is reported in earnings. The changes in fair value of the related interest rate swap are also reflected in earnings, which provides a natural offset to the debt's fair value change. To the extent that the two amounts differ because the full change in the fair value of the debt includes risks not offset by the interest rate swap, the difference is automatically captured in current earnings.

Additional economic hedges include hedges of the credit risk component of commercial loans and loan commitments. Citigroup periodically evaluates its hedging strategies in other areas and may designate either an accounting hedge or an economic hedge after considering the relative costs and benefits. Economic hedges are also employed when the hedged item itself is marked-to-market through current earnings, such as hedges of commitments to originate one- to four-family mortgage loans to be HFS and MSRs.

Credit Derivatives

Citi is a market maker and trades a range of credit derivatives. Through these contracts, Citi either purchases or writes protection on either a single name or a portfolio of reference credits. Citi also uses credit derivatives to help mitigate credit risk in its corporate and consumer loan portfolios and other cash positions and to facilitate client transactions.

Citi monitors its counterparty credit risk in credit derivative contracts. As of December 31, 2022 and 2021, approximately 98% and 99%, respectively, of the gross receivables are from counterparties with which Citi maintains master netting agreements, collateral agreements or settles daily. A majority of Citi's top 15 counterparties (by receivable balance owed to Citi) are central clearing houses, banks, financial institutions or other dealers. Contracts with these counterparties do not include ratings-based termination events. However, counterparty ratings downgrades may have an incremental effect by lowering the threshold at which Citi may call for additional collateral.

The range of credit derivatives entered into includes credit default swaps, total return swaps, credit options and credit-linked notes.

A credit default swap is a contract in which, for a fee, a protection seller agrees to reimburse a protection buyer for any losses that occur due to a predefined credit event on a reference entity. These credit events are defined by the terms of the derivative contract and the reference entity and are generally limited to the market standard of failure to pay on indebtedness and bankruptcy of the reference entity and, in a more limited range of transactions, debt restructuring. Credit derivative transactions that reference emerging market entities also typically include additional credit events to cover the acceleration of indebtedness and the risk of repudiation or a payment moratorium. In certain transactions, protection may be provided on a portfolio of reference entities or asset-backed securities. If there is no credit event, as defined by the specific derivative contract, then the protection seller makes no payments to the protection buyer and receives only the contractually specified fee. However, if a credit event occurs as defined in the specific derivative contract sold, the protection seller will be required to make a payment to the protection buyer. Under certain contracts, the seller of protection may not be required to make a payment until a specified amount of losses has occurred with respect to the portfolio and/or may only be required to pay for losses up to a specified amount.

A total return swap typically transfers the total economic performance of a reference asset, which includes all associated

cash flows, as well as capital appreciation or depreciation. The protection buyer receives a floating rate of interest and any depreciation on the reference asset from the protection seller and, in return, the protection seller receives the cash flows associated with the reference asset plus any appreciation. Thus, according to the total return swap agreement, the protection seller will be obligated to make a payment any time the floating interest rate payment plus any depreciation of the reference asset exceeds the cash flows associated with the underlying asset. A total return swap may terminate upon a default of the reference asset or a credit event with respect to the reference entity, subject to the provisions of the related total return swap agreement between the protection seller and the protection buyer.

A credit option is a credit derivative that allows investors to trade or hedge changes in the credit quality of a reference entity. For example, in a credit spread option, the option writer assumes the obligation to purchase or sell credit protection on the reference entity at a specified "strike" spread level. The option purchaser buys the right to sell credit default protection on the reference entity to, or purchase it from, the option writer at the strike spread level. The payments on credit spread options depend either on a particular credit spread or the price of the underlying credit-sensitive asset or other reference entity. The options usually terminate if a credit event occurs with respect to the underlying reference entity.

A credit-linked note is a form of credit derivative structured as a debt security with an embedded credit default swap. The purchaser of the note effectively provides credit protection to the issuer by agreeing to receive a return that could be negatively affected by credit events on the underlying reference entity. If the reference entity defaults, the note may be cash settled or physically settled by delivery of a debt security of the reference entity. Thus, the maximum amount of the note purchaser's exposure is the amount paid for the credit-linked note.

The following tables summarize the key characteristics of Citi's credit derivatives portfolio by counterparty and derivative form:

	Fair values		Notionals	
In millions of dollars at December 31, 2022	Receivable[1]	Payable[2]	Protection purchased	Protection sold
By industry of counterparty				
Banks	$ 1,835	$ 2,479	$ 100,628	$ 96,143
Broker-dealers	1,893	1,478	48,760	44,148
Non-financial	47	15	1,562	1,585
Insurance and other financial institutions	4,614	3,805	490,689	451,260
Total by industry of counterparty	$ 8,389	$ 7,777	$ 641,639	$ 593,136
By instrument				
Credit default swaps and options	$ 6,867	$ 7,360	$ 623,981	$ 586,504
Total return swaps and other	1,522	417	17,658	6,632
Total by instrument	$ 8,389	$ 7,777	$ 641,639	$ 593,136
By rating of reference entity				
Investment grade	$ 3,796	$ 2,970	$ 499,339	$ 462,873
Non-investment grade	4,593	4,807	142,300	130,263
Total by rating of reference entity	$ 8,389	$ 7,777	$ 641,639	$ 593,136
By maturity				
Within 1 year	$ 1,753	$ 1,801	$ 147,031	$ 148,721
From 1 to 5 years	4,577	4,134	443,113	407,293
After 5 years	2,059	1,842	51,495	37,122
Total by maturity	$ 8,389	$ 7,777	$ 641,639	$ 593,136

(1) The fair value amount receivable is composed of $5,094 million under protection purchased and $3,295 million under protection sold.
(2) The fair value amount payable is composed of $3,573 million under protection purchased and $4,204 million under protection sold.

	Fair values		Notionals	
In millions of dollars at December 31, 2021	Receivable[1]	Payable[2]	Protection purchased	Protection sold
By industry of counterparty				
Banks	$ 2,375	$ 3,031	$ 108,415	$ 103,756
Broker-dealers	1,962	1,139	44,364	40,068
Non-financial	113	306	2,785	2,728
Insurance and other financial institutions	5,768	6,539	490,432	425,934
Total by industry of counterparty	$ 10,218	$ 11,015	$ 645,996	$ 572,486
By instrument				
Credit default swaps and options	$ 9,923	$ 10,234	$ 628,136	$ 565,131
Total return swaps and other	295	781	17,860	7,355
Total by instrument	$ 10,218	$ 11,015	$ 645,996	$ 572,486
By rating of reference entity				
Investment grade	$ 4,149	$ 4,258	$ 511,652	$ 448,944
Non-investment grade	6,069	6,757	134,344	123,542
Total by rating of reference entity	$ 10,218	$ 11,015	$ 645,996	$ 572,486
By maturity				
Within 1 year	$ 878	$ 1,462	$ 133,866	$ 115,603
From 1 to 5 years	6,674	6,638	454,617	413,174
After 5 years	2,666	2,915	57,513	43,709
Total by maturity	$ 10,218	$ 11,015	$ 645,996	$ 572,486

(1) The fair value amount receivable is composed of $3,705 million under protection purchased and $6,513 million under protection sold.
(2) The fair value amount payable is composed of $7,354 million under protection purchased and $3,661 million under protection sold.

Fair values included in the above tables are prior to application of any netting agreements and cash collateral. For notional amounts, Citi generally has a mismatch between the total notional amounts of protection purchased and sold, and it may hold the reference assets directly rather than entering into offsetting credit derivative contracts as and when desired. The open risk exposures from credit derivative contracts are largely matched after certain cash positions in reference assets are considered and after notional amounts are adjusted, either to a duration-based equivalent basis or to reflect the level of subordination in tranched structures. The ratings of the credit derivatives portfolio presented in the tables and used to evaluate payment/performance risk are based on the assigned internal or external ratings of the reference asset or entity. Where external ratings are used, investment-grade ratings are considered to be "Baa/BBB" and above, while anything below is considered non-investment grade. Citi's internal ratings are in line with the related external rating system.

Citigroup evaluates the payment/performance risk of the credit derivatives for which it stands as a protection seller based on the credit rating assigned to the underlying reference credit. Credit derivatives written on an underlying non-investment-grade reference entity represent greater payment risk to the Company. The non-investment-grade category in the table above also includes credit derivatives where the underlying reference entity has been downgraded subsequent to the inception of the derivative.

The maximum potential amount of future payments under credit derivative contracts presented in the table above is based on the notional value of the derivatives. The Company believes that the notional amount for credit protection sold is not representative of the actual loss exposure based on historical experience. This amount has not been reduced by the value of the reference assets and the related cash flows. In accordance with most credit derivative contracts, should a credit event occur, the Company usually is liable for the difference between the protection sold and the value of the reference assets. Furthermore, the notional amount for credit protection sold has not been reduced for any cash collateral paid to a given counterparty, as such payments would be calculated after netting all derivative exposures, including any credit derivatives with that counterparty in accordance with a related master netting agreement. Due to such netting processes, determining the amount of collateral that corresponds to credit derivative exposures alone is not possible. The Company actively monitors open credit-risk exposures and manages this exposure by using a variety of strategies, including purchased credit derivatives, cash collateral or direct holdings of the referenced assets. This risk mitigation activity is not captured in the table above.

Credit Risk-Related Contingent Features in Derivatives

Certain derivative instruments contain provisions that require the Company to either post additional collateral or immediately settle any outstanding liability balances upon the occurrence of a specified event related to the credit risk of the Company. These events, which are defined by the existing derivative contracts, are primarily downgrades in the credit ratings of the Company and its affiliates.

The fair value (excluding CVA) of all derivative instruments with credit risk-related contingent features that were in a net liability position at December 31, 2022 and 2021 was $18 billion and $19 billion, respectively. The Company posted $15 billion and $16 billion as collateral for this exposure in the normal course of business as of December 31, 2022 and 2021, respectively.

A downgrade could trigger additional collateral or cash settlement requirements for the Company and certain affiliates. In the event that Citigroup and Citibank were downgraded a single notch by all three major rating agencies as of December 31, 2022, the Company could be required to post an additional $0.9 billion as either collateral or settlement of the derivative transactions. In addition, the Company could be required to segregate with third-party custodians collateral previously received from existing derivative counterparties in the amount of $15.0 million upon the single notch downgrade, resulting in aggregate cash obligations and collateral requirements of approximately $0.9 billion.

Derivatives Accompanied by Financial Asset Transfers

The Company executes total return swaps that provide it with synthetic exposure to substantially all of the economic return of the securities or other financial assets referenced in the contract. In certain cases, the derivative transaction is accompanied by the Company's transfer of the referenced financial asset to the derivative counterparty, most typically in response to the derivative counterparty's desire to hedge, in whole or in part, its synthetic exposure under the derivative contract by holding the referenced asset in funded form. In certain jurisdictions these transactions qualify as sales, resulting in derecognition of the securities transferred (see Note 1 for further discussion of the related sale conditions for transfers of financial assets). For a significant portion of the transactions, the Company has also executed another total return swap where the Company passes on substantially all of the economic return of the referenced securities to a different third party seeking the exposure. In those cases, the Company is not exposed, on a net basis, to changes in the economic return of the referenced securities.

These transactions generally involve the transfer of the Company's liquid government bonds, convertible bonds or publicly traded corporate equity securities from the trading portfolio and are executed with third-party financial institutions. The accompanying derivatives are typically total return swaps. The derivatives are cash settled and subject to ongoing margin requirements.

When the conditions for sale accounting are met, the Company reports the transfer of the referenced financial asset as a sale and separately reports the accompanying derivative transaction. These transactions generally do not result in a gain or loss on the sale of the security, because the transferred

security was held at fair value in the Company's trading portfolio. For transfers of financial assets accounted for as a sale by the Company, and for which the Company has retained substantially all of the economic exposure to the transferred asset through a total return swap executed with the same counterparty in contemplation of the initial sale (and still outstanding), the asset amounts derecognized and the gross cash proceeds received as of the date of derecognition were $1.4 billion and $2.9 billion as of December 31, 2022 and 2021, respectively.

At December 31, 2022, the fair value of these previously derecognized assets was $1.4 billion. The fair value of the total return swaps as of December 31, 2022 was $27 million recorded as gross derivative assets and $32 million recorded as gross derivative liabilities. At December 31, 2021 the fair value of these previously derecognized assets was $2.9 billion, and the fair value of the total return swaps was $13 million recorded as gross derivative assets and $58 million recorded as gross derivative liabilities.

The balances for the total return swaps are on a gross basis, before the application of counterparty and cash collateral netting, and are included primarily as equity derivatives in the tabular disclosures in this Note.

24. CONCENTRATIONS OF CREDIT RISK

Concentrations of credit risk exist when changes in economic, industry or geographic factors similarly affect groups of counterparties whose aggregate credit exposure is material in relation to Citigroup's total credit exposure. Although Citigroup's portfolio of financial instruments is broadly diversified along industry, product and geographic lines, material transactions are completed with other financial institutions, particularly in the securities trading, derivatives and foreign exchange businesses.

In connection with the Company's efforts to maintain a diversified portfolio, the Company limits its exposure to any one geographic region, country or individual creditor and monitors this exposure on a continuous basis. At December 31, 2022, Citigroup's most significant concentration of credit risk was with the U.S. government and its agencies. The Company's exposure, which primarily results from trading assets and investments issued by the U.S. government and its agencies, amounted to $431.6 billion and $414.5 billion at December 31, 2022 and 2021, respectively. The German, Japanese and United Kingdom governments and their agencies, which are rated investment grade by both Moody's and S&P, were the next largest exposures. The Company's exposure to Germany amounted to $48.3 billion and $48.9 billion at December 31, 2022 and 2021, respectively. The Company's exposure to Japan amounted to $40.0 billion and $30.1 billion at December 31, 2022 and 2021, respectively. The Company's exposure to the United Kingdom amounted to $31.7 billion and $31.1 billion at December 31, 2022 and 2021, respectively. The foreign government exposures are composed of investment securities, loans and trading assets.

The Company's exposure to states and municipalities amounted to $20.1 billion and $22.0 billion at December 31, 2022 and 2021, respectively, and was composed of trading assets, investment securities, derivatives and lending activities.

25. FAIR VALUE MEASUREMENT

ASC 820-10, *Fair Value Measurement*, defines fair value, establishes a consistent framework for measuring fair value and requires disclosures about fair value measurements. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date, and therefore represents an exit price. Among other things, the standard requires the Company to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value.

Under ASC 820-10, the probability of counterparty default is factored into the valuation of derivative and other positions, and the impact of Citigroup's own credit risk is also factored into the valuation of derivatives and other liabilities that are measured at fair value.

Fair Value Hierarchy

ASC 820-10 specifies a hierarchy of inputs based on whether the inputs are observable or unobservable. Observable inputs are developed using market data and reflect market participant assumptions, while unobservable inputs reflect the Company's market assumptions. These two types of inputs have created the following fair value hierarchy:

- Level 1: Quoted prices for *identical* instruments in active markets.
- Level 2: Quoted prices for *similar* instruments in active markets, quoted prices for identical or similar instruments in markets that are not active and model-derived valuations in which all significant inputs and significant value drivers are *observable* in the market.
- Level 3: Valuations derived from valuation techniques in which one or more significant inputs or significant value drivers are *unobservable*.

As required under the fair value hierarchy, the Company considers relevant and observable market inputs in its valuations where possible.

The fair value hierarchy classification approach typically utilizes rules-based and data-driven selection criteria to determine whether an instrument is classified as Level 1, Level 2 or Level 3:

- The determination of whether an instrument is quoted in an active market and therefore considered a Level 1 instrument is based upon the frequency of observed transactions and the quality of independent market data available on the measurement date.
- A Level 2 classification is assigned where there is observability of prices/market inputs to models, or where any unobservable inputs are not significant to the valuation. The determination of whether an input is considered observable is based on the availability of independent market data and its corroboration, for example through observed transactions in the market.
- Otherwise, an instrument is classified as Level 3.

Determination of Fair Value

For assets and liabilities carried at fair value, the Company measures fair value using the procedures set out below, irrespective of whether the assets and liabilities are measured at fair value as a result of an election, a non-recurring lower-of-cost-or-market (LOCOM) adjustment, or because they are required to be measured at fair value.

When available, the Company uses quoted market prices from active markets to determine fair value and classifies such items as Level 1. In some specific cases where a market price is available, the Company will apply practical expedients (such as matrix pricing) to calculate fair value, in which case the items may be classified as Level 2.

The Company may also apply a price-based methodology that utilizes, where available, quoted prices or other market information obtained from recent trading activity in positions with the same or similar characteristics to the position being valued. If relevant and observable prices are available, those valuations may be classified as Level 2. However, when there are one or more significant unobservable "price" inputs, those valuations will be classified as Level 3. Furthermore, when a quoted price is considered stale, a significant adjustment to the price of a similar security may be necessary to reflect differences in the terms of the actual security or loan being valued, or alternatively, when prices from independent sources may be insufficient to corroborate a valuation, the "price" inputs are considered unobservable and the fair value measurements are classified as Level 3.

If quoted market prices are not available, fair value is based upon internally developed valuation techniques that use, where possible, current market-based parameters, such as interest rates, currency rates and option volatilities. Items valued using such internally generated valuation techniques are classified according to the lowest level input or value driver that is significant to the valuation. Thus, an item may be classified as Level 3 even though there may be some significant inputs that are readily observable.

Fair value estimates from internal valuation techniques are verified, where possible, to prices obtained from independent vendors or brokers. Vendors' and brokers' valuations may be based on a variety of inputs ranging from observed prices to proprietary valuation models, and the Company assesses the quality and relevance of this information in determining the estimate of fair value. The following section describes the valuation methodologies used by the Company to measure various financial instruments at fair value. Where appropriate, the description includes details of the valuation models, the key inputs to those models and any significant assumptions.

Market Valuation Adjustments

Generally, the unit of account for a financial instrument is the individual financial instrument. The Company applies market valuation adjustments that are consistent with the unit of account, which does not include adjustment due to the size of the Company's position, except as follows. ASC 820-10 permits an exception, through an accounting policy election, to measure the fair value of a portfolio of financial assets and financial liabilities on the basis of the net open risk position when certain criteria are met. Citi has elected to measure

certain portfolios of financial instruments that meet those criteria, such as derivatives, on the basis of the net open risk position. The Company applies market valuation adjustments, including adjustments to account for the size of the net open risk position, consistent with market participant assumptions.

Valuation adjustments are applied to items classified as Level 2 or Level 3 in the fair value hierarchy to ensure that the fair value reflects the price at which the net open risk position could be exited. These valuation adjustments are based on the bid/offer spread for an instrument in the market. When Citi has elected to measure certain portfolios of financial investments, such as derivatives, on the basis of the net open risk position, the valuation adjustment may take into account the size of the position.

Credit valuation adjustments (CVA) and funding valuation adjustments (FVA) are applied to the relevant population of over-the-counter (OTC) derivative instruments where adjustments to reflect counterparty credit risk, own credit risk and term funding risk are required to estimate fair value. This principally includes derivatives with a base valuation (e.g., discounted using overnight indexed swap (OIS)) requiring adjustment for these effects, such as uncollateralized interest rate swaps. The CVA represents a portfolio-level adjustment to reflect the risk premium associated with the counterparty's (assets) or Citi's (liabilities) non-performance risk.

The FVA represents a market funding risk premium inherent in the uncollateralized portion of a derivative portfolio and in certain collateralized derivative portfolios that do not include standard credit support annexes (CSAs), such as where the CSA does not permit the reuse of collateral received. Citi's FVA methodology leverages the existing CVA methodology to estimate a funding exposure profile. The calculation of this exposure profile considers collateral agreements in which the terms do not permit the Company to reuse the collateral received, including where counterparties post collateral to third-party custodians. Citi's CVA and FVA methodologies consist of two steps:

- First, the exposure profile for each counterparty is determined using the terms of all individual derivative positions and a Monte Carlo simulation or other quantitative analysis to generate a series of expected cash flows at future points in time. The calculation of this exposure profile considers the effect of credit risk mitigants and sources of funding, including pledged cash or other collateral and any legal right of offset that exists with a counterparty through arrangements such as netting agreements. Individual derivative contracts that are subject to an enforceable master netting agreement with a counterparty are aggregated as a netting set for this purpose, since it is those aggregate net cash flows that are subject to nonperformance risk. This process identifies specific, point-in-time future cash flows that are subject to nonperformance and term funding risk, rather than using the current recognized net asset or liability as a basis to measure the CVA and FVA.
- Second, for CVA, market-based views of default probabilities derived from observed credit spreads in the credit default swap (CDS) market are applied to the expected future cash flows determined in step one. Citi's own credit CVA is determined using Citi-specific CDS spreads for the relevant tenor. Generally, counterparty CVA is determined using CDS spread indices for each credit rating and tenor. For certain identified netting sets where individual analysis is practicable (e.g., exposures to counterparties with liquid CDSs), counterparty-specific CDS spreads are used. For FVA, a term structure of spreads is applied to the expected funding exposures (e.g., the market liquidity spread used to represent the term funding premium associated with certain OTC derivatives).

The CVA and FVA are designed to incorporate a market view of the credit and funding risk, respectively, inherent in the derivative portfolio. However, most unsecured derivative instruments are negotiated bilateral contracts and are not commonly transferred to third parties. Derivative instruments are normally settled contractually or, if terminated early, are terminated at a value negotiated bilaterally between the counterparties. Thus, the CVA and FVA may not be realized upon a settlement or termination in the normal course of business. In addition, all or a portion of these adjustments may be reversed or otherwise adjusted in future periods in the event of changes in the credit or funding risk associated with the derivative instruments.

The table below summarizes the CVA and FVA applied to the fair value of derivative instruments at December 31, 2022 and 2021:

	Credit and funding valuation adjustments contra-liability (contra-asset)	
In millions of dollars	**December 31, 2022**	December 31, 2021
Counterparty CVA	**$ (816)**	$ (705)
Asset FVA	**(622)**	(433)
Citigroup (own credit) CVA	**607**	379
Liability FVA	**263**	110
Total CVA and FVA—derivative instruments	**$ (568)**	$ (649)

The table below summarizes pretax gains (losses) related to changes in CVA on derivative instruments, net of hedges, FVA on derivatives and debt valuation adjustments (DVA) on Citi's own fair value option (FVO) liabilities for the years indicated:

	Credit/funding/debt valuation adjustments gain (loss)		
In millions of dollars	**2022**	2021	2020
Counterparty CVA	$ **(227)**	$ 79	$ (101)
Asset FVA	**(102)**	96	(95)
Own credit CVA	**157**	(33)	133
Liability FVA	**155**	(22)	(6)
Total CVA and FVA—derivative instruments	$ **(17)**	$ 120	$ (69)
DVA related to own FVO liabilities[1]	$ **2,685**	$ 296	$ (616)
Total CVA, DVA and FVA	$ **2,668**	$ 416	$ (685)

(1) See Note 20.

Securities Purchased Under Agreements to Resell and Securities Sold Under Agreements to Repurchase

No quoted prices exist for these instruments, since fair value is determined using a discounted cash flow technique. Cash flows are estimated based on the terms of the contract, taking into account any embedded derivatives or other features. These cash flows are discounted using interest rates appropriate to the maturity of the instrument as well as the nature of the underlying collateral. Generally, when such instruments are recorded at fair value, they are classified within Level 2 of the fair value hierarchy, as the inputs used in the valuation are readily observable. However, certain long-dated positions are classified within Level 3 of the fair value hierarchy.

Trading Account Assets and Liabilities—Trading Securities and Trading Loans

When available, the Company uses quoted market prices in active markets to determine the fair value of trading securities; such items are classified as Level 1 of the fair value hierarchy. Examples include government securities and exchange-traded equity securities.

For bonds and secondary market loans traded over the counter, the Company generally determines fair value utilizing various valuation techniques, including discounted cash flows, price-based and internal models. Fair value estimates from these internal valuation techniques are verified, where possible, to prices obtained from independent sources, including third-party vendors. A price-based methodology utilizes, where available, quoted prices or other market information obtained from recent trading activity of assets with similar characteristics to the bond or loan being valued. The yields used in discounted cash flow models are derived from the same price information. Trading securities and loans priced using such methods are generally classified as Level 2. However, when the primary inputs to the valuation are unobservable, or prices from independent sources are insufficient to corroborate valuation, a loan or security is generally classified as Level 3. Fair value estimates from these internal valuation techniques are verified, where possible, to prices obtained from independent sources, including third-party vendors.

When the Company's principal exit market for a portfolio of loans is through securitization, the Company uses the securitization price as a key input into the fair value of the loan portfolio. The securitization price is determined from the assumed proceeds of a hypothetical securitization within the current market environment. Where such a price verification is possible, loan portfolios are typically classified as Level 2 in the fair value hierarchy.

For most of the subprime mortgage backed security (MBS) exposures, fair value is determined utilizing observable transactions where available, or other valuation techniques such as discounted cash flow analysis utilizing valuation assumptions derived from similar, more observable securities as market proxies. The valuation of certain asset-backed security (ABS) CDO positions is inferred through the net asset value of the underlying assets of the ABS CDO.

Trading Account Assets and Liabilities—Derivatives

Exchange-traded derivatives, measured at fair value using quoted (i.e., exchange) prices in active markets, where available, are classified as Level 1 of the fair value hierarchy.

Derivatives without a quoted price in an active market and derivatives executed over the counter are valued using internal valuation techniques. These derivative instruments are classified as either Level 2 or Level 3 depending on the observability of the significant inputs to the model.

The valuation techniques depend on the type of derivative and the nature of the underlying instrument. The principal techniques used to value these instruments are discounted cash flows and internal models, such as derivative pricing models (e.g., Black-Scholes and Monte Carlo simulations).

The key inputs depend upon the type of derivative and the nature of the underlying instrument and include interest rate yield curves, foreign exchange rates, volatilities and correlation.

Investments

The investments category includes available-for-sale debt and marketable equity securities whose fair values are generally determined by utilizing similar procedures described for trading securities above or, in some cases, using vendor pricing as the primary source.

Also included in investments are nonpublic investments in private equity and real estate entities. Determining the fair value of nonpublic securities involves a significant degree of management judgment, as no quoted prices exist and such securities are not generally traded. In addition, there may be transfer restrictions on private equity securities. The Company's process for determining the fair value of such securities utilizes commonly accepted valuation techniques, including guideline public company analysis and comparable transactions. In determining the fair value of nonpublic securities, the Company also considers events such as a proposed sale of the investee company, initial public offerings, equity issuances or other observable transactions. Private

equity securities are generally classified as Level 3 of the fair value hierarchy.

In addition, the Company holds investments in certain alternative investment funds that calculate NAV per share, including hedge funds, private equity funds and real estate funds. Investments in funds are generally classified as non-marketable equity securities carried at fair value. The fair values of these investments are estimated using the NAV per share of the Company's ownership interest in the funds where it is not probable that the investment will be realized at a price other than the NAV. Consistent with the provisions of ASU 2015-07, these investments are categorized within the fair value hierarchy and are not included in the tables below. See Note 13 for additional information.

Short-Term Borrowings and Long-Term Debt

Where fair value accounting has been elected, the fair value of non-structured liabilities is determined by utilizing internal models using the appropriate discount rate for the applicable maturity. Such instruments are classified as Level 2 of the fair value hierarchy when all significant inputs are readily observable.

The Company determines the fair value of hybrid financial instruments, including structured liabilities, using the appropriate derivative valuation methodology (described above in "Trading Account Assets and Liabilities—Derivatives") given the nature of the embedded risk profile. Such instruments are classified as Level 2 or Level 3 depending on the observability of significant inputs to the model.

Items Measured at Fair Value on a Recurring Basis

The following tables present for each of the fair value hierarchy levels the Company's assets and liabilities that are measured at fair value on a recurring basis at December 31, 2022 and 2021. The Company may hedge positions that have been classified in the Level 3 category with other financial instruments (hedging instruments) that may be classified as Level 3, but also with financial instruments classified as Level 1 or Level 2. The effects of these hedges are presented gross in the following tables:

Fair Value Levels

In millions of dollars at December 31, 2022	Level 1	Level 2	Level 3	Gross inventory	Netting[1]	Net balance
Assets						
Securities borrowed and purchased under agreements to resell	$ —	$ 350,145	$ 149	$ 350,294	$ (110,767)	$ 239,527
Trading non-derivative assets						
Trading mortgage-backed securities						
U.S. government-sponsored agency guaranteed	—	34,878	600	35,478	—	35,478
Residential	1	1,821	166	1,988	—	1,988
Commercial	—	798	145	943	—	943
Total trading mortgage-backed securities	$ 1	$ 37,497	$ 911	$ 38,409	$ —	$ 38,409
U.S. Treasury and federal agency securities	$ 63,067	$ 4,513	$ 1	$ 67,581	$ —	$ 67,581
State and municipal	—	2,256	7	2,263	—	2,263
Foreign government	38,383	25,850	119	64,352	—	64,352
Corporate	1,593	11,955	394	13,942	—	13,942
Equity securities	43,990	10,179	192	54,361	—	54,361
Asset-backed securities	—	1,597	668	2,265	—	2,265
Other trading assets[2]	24	14,963	648	15,635	—	15,635
Total trading non-derivative assets	$ 147,058	$ 108,810	$ 2,940	$ 258,808	$ —	$ 258,808
Trading derivatives						
Interest rate contracts	$ 297	$ 174,156	$ 3,751	$ 178,204		
Foreign exchange contracts	—	186,897	766	187,663		
Equity contracts	20	40,683	1,704	42,407		
Commodity contracts	—	26,823	1,501	28,324		
Credit derivatives	—	7,484	905	8,389		
Total trading derivatives—before netting and collateral	$ 317	$ 436,043	$ 8,627	$ 444,987		
Netting agreements					$ (346,545)	
Netting of cash collateral received					(23,136)	
Total trading derivatives—after netting and collateral	$ 317	$ 436,043	$ 8,627	$ 444,987	$ (369,681)	$ 75,306
Investments						
Mortgage-backed securities						
U.S. government-sponsored agency guaranteed	$ —	$ 11,232	$ 30	$ 11,262	$ —	$ 11,262
Residential	—	444	41	485	—	485
Commercial	—	2	—	2	—	2
Total investment mortgage-backed securities	$ —	$ 11,678	$ 71	$ 11,749	$ —	$ 11,749
U.S. Treasury and federal agency securities	$ 91,851	$ 439	$ —	$ 92,290	$ —	$ 92,290
State and municipal	—	1,637	586	2,223	—	2,223
Foreign government	58,419	74,250	608	133,277	—	133,277
Corporate	2,230	2,343	343	4,916	—	4,916
Marketable equity securities	254	165	10	429	—	429
Asset-backed securities	—	1,029	1	1,030	—	1,030
Other debt securities	—	4,194	—	4,194	—	4,194
Non-marketable equity securities[3]	—	9	430	439	—	439
Total investments	$ 152,754	$ 95,744	$ 2,049	$ 250,547	$ —	$ 250,547

Table continues on the next page.

In millions of dollars at December 31, 2022	Level 1	Level 2	Level 3	Gross inventory	Netting[1]	Net balance
Loans	$ —	$ 3,999	$ 1,361	$ 5,360	$ —	$ 5,360
Mortgage servicing rights	—	—	665	665	—	665
Non-trading derivatives and other financial assets measured on a recurring basis	$ 4,310	$ 6,291	$ 57	$ 10,658	$ —	$ 10,658
Total assets	$ 304,439	$ 1,001,032	$ 15,848	$ 1,321,319	$ (480,448)	$ 840,871
Total as a percentage of gross assets[4]	23.0 %	75.8 %	1.2 %			
Liabilities						
Interest-bearing deposits	$ —	$ 1,860	$ 15	$ 1,875	$ —	$ 1,875
Securities loaned and sold under agreements to repurchase	—	155,822	1,031	156,853	(85,967)	70,886
Trading account liabilities						
Securities sold, not yet purchased	97,559	13,111	50	110,720	—	110,720
Other trading liabilities	—	8	3	11	—	11
Total trading liabilities	$ 97,559	$ 13,119	$ 53	$ 110,731	$ —	$ 110,731
Trading derivatives						
Interest rate contracts	$ 175	$ 169,049	$ 3,396	$ 172,620		
Foreign exchange contracts	—	185,279	716	185,995		
Equity contracts	70	40,905	2,808	43,783		
Commodity contracts	2	25,093	1,223	26,318		
Credit derivatives	—	6,715	1,062	7,777		
Total trading derivatives—before netting and collateral	$ 247	$ 427,041	$ 9,205	$ 436,493		
Netting agreements					$ (346,545)	
Netting of cash collateral paid					(30,032)	
Total trading derivatives—after netting and collateral	$ 247	$ 427,041	$ 9,205	$ 436,493	$ (376,577)	$ 59,916
Short-term borrowings	$ —	$ 6,184	$ 38	$ 6,222	$ —	$ 6,222
Long-term debt	—	69,878	36,117	105,995	—	105,995
Total non-trading derivatives and other financial liabilities measured on a recurring basis	$ 4,197	$ 240	$ 2	$ 4,439	$ —	$ 4,439
Total liabilities	$ 102,003	$ 674,144	$ 46,461	$ 822,608	$ (462,544)	$ 360,064
Total as a percentage of gross liabilities[4]	12.4 %	82.0 %	5.6 %			

(1) Represents netting of (i) the amounts due under securities purchased under agreements to resell and the amounts owed under securities sold under agreements to repurchase and (ii) derivative exposures covered by a qualifying master netting agreement and cash collateral offsetting.

(2) Includes positions related to investments in unallocated precious metals, as discussed in Note 26. Also includes physical commodities accounted for at the lower of cost or fair value and unfunded credit products.

(3) Amounts exclude $27 million of investments measured at net asset value (NAV) in accordance with ASU 2015-07, *Fair Value Measurement (Topic 820): Disclosures for Investments in Certain Entities That Calculate Net Asset Value per Share (or Its Equivalent)*.

(4) Because the amount of the cash collateral paid/received has not been allocated to the Level 1, 2 and 3 subtotals, these percentages are calculated based on total assets and liabilities measured at fair value on a recurring basis, excluding the cash collateral paid/received on derivatives.

Fair Value Levels

In millions of dollars at December 31, 2021	Level 1	Level 2	Level 3	Gross inventory	Netting[1]	Net balance
Assets						
Securities borrowed and purchased under agreements to resell	$ —	$ 342,030	$ 231	$ 342,261	$ (125,795)	$216,466
Trading non-derivative assets						
Trading mortgage-backed securities						
U.S. government-sponsored agency guaranteed	—	34,534	496	35,030	—	35,030
Residential	1	643	104	748	—	748
Commercial	—	778	81	859	—	859
Total trading mortgage-backed securities	$ 1	$ 35,955	$ 681	$ 36,637	$ —	$ 36,637
U.S. Treasury and federal agency securities	$ 44,900	$ 3,230	$ 4	$ 48,134	$ —	$ 48,134
State and municipal	—	1,995	37	2,032	—	2,032
Foreign government	39,176	31,485	23	70,684	—	70,684
Corporate	1,544	16,156	412	18,112	—	18,112
Equity securities	53,833	10,047	174	64,054	—	64,054
Asset-backed securities	—	981	613	1,594	—	1,594
Other trading assets[2]	—	20,346	576	20,922	—	20,922
Total trading non-derivative assets	$ 139,454	$ 120,195	$ 2,520	$ 262,169	$ —	$262,169
Trading derivatives						
Interest rate contracts	$ 90	$ 161,500	$ 3,898	$ 165,488		
Foreign exchange contracts	—	134,912	637	135,549		
Equity contracts	41	43,904	1,307	45,252		
Commodity contracts	—	28,547	1,797	30,344		
Credit derivatives	—	9,299	919	10,218		
Total trading derivatives—before netting and collateral	$ 131	$ 378,162	$ 8,558	$ 386,851		
Netting agreements					$ (292,628)	
Netting of cash collateral received[3]					(24,447)	
Total trading derivatives—after netting and collateral	$ 131	$ 378,162	$ 8,558	$ 386,851	$ (317,075)	$ 69,776
Investments						
Mortgage-backed securities						
U.S. government-sponsored agency guaranteed	$ —	$ 33,165	$ 51	$ 33,216	$ —	$ 33,216
Residential	—	286	94	380	—	380
Commercial	—	25	—	25	—	25
Total investment mortgage-backed securities	$ —	$ 33,476	$ 145	$ 33,621	$ —	$ 33,621
U.S. Treasury and federal agency securities	$ 122,271	$ 168	$ 1	$ 122,440	$ —	$122,440
State and municipal	—	1,849	772	2,621	—	2,621
Foreign government	56,842	61,112	786	118,740	—	118,740
Corporate	2,861	2,871	188	5,920	—	5,920
Marketable equity securities	350	177	16	543	—	543
Asset-backed securities	—	300	3	303	—	303
Other debt securities	—	4,877	—	4,877	—	4,877
Non-marketable equity securities[4]	—	28	316	344	—	344
Total investments	$ 182,324	$ 104,858	$ 2,227	$ 289,409	$ —	$289,409

Table continues on the next page.

In millions of dollars at December 31, 2021	Level 1	Level 2	Level 3	Gross inventory	Netting[1]	Net balance
Loans	$ —	$ 5,371	$ 711	$ 6,082	$ —	$ 6,082
Mortgage servicing rights	—	—	404	404	—	404
Non-trading derivatives and other financial assets measured on a recurring basis	$ 4,075	$ 8,194	$ 73	$ 12,342	$ —	$ 12,342
Total assets	$ 325,984	$ 958,810	$ 14,724	$ 1,299,518	$ (442,870)	$ 856,648
Total as a percentage of gross assets[5]	29.0 %	69.9 %	1.1 %			
Liabilities						
Interest-bearing deposits	$ —	$ 1,483	$ 183	$ 1,666	$ —	$ 1,666
Securities loaned and sold under agreements to repurchase	—	174,318	643	174,961	(118,267)	56,694
Trading account liabilities						
Securities sold, not yet purchased	82,675	23,268	65	106,008	—	106,008
Other trading liabilities	—	5	—	5	—	5
Total trading account liabilities	$ 82,675	$ 23,273	$ 65	$ 106,013	$ —	$ 106,013
Trading derivatives						
Interest rate contracts	$ 56	$ 147,846	$ 2,172	$ 150,074		
Foreign exchange contracts	—	134,572	726	135,298		
Equity contracts	60	46,177	3,447	49,684		
Commodity contracts	—	30,004	1,375	31,379		
Credit derivatives	—	10,065	950	11,015		
Total trading derivatives—before netting and collateral	$ 116	$ 368,664	$ 8,670	$ 377,450		
Netting agreements					$ (292,628)	
Netting of cash collateral paid[3]					(29,306)	
Total trading derivatives—after netting and collateral	$ 116	$ 368,664	$ 8,670	$ 377,450	$ (321,934)	$ 55,516
Short-term borrowings	$ —	$ 7,253	$ 105	$ 7,358	$ —	$ 7,358
Long-term debt	—	57,100	25,509	82,609	—	82,609
Non-trading derivatives and other financial liabilities measured on a recurring basis	$ 3,574	$ —	$ 1	$ 3,575	$ —	$ 3,575
Total liabilities	$ 86,365	$ 632,091	$ 35,176	$ 753,632	$ (440,201)	$ 313,431
Total as a percentage of gross liabilities[5]	11.5 %	83.9 %	4.7 %			

(1) Represents netting of (i) the amounts due under securities purchased under agreements to resell and the amounts owed under securities sold under agreements to repurchase and (ii) derivative exposures covered by a qualifying master netting agreement and cash collateral offsetting.

(2) Includes positions related to investments in unallocated precious metals, as discussed in Note 26. Also includes physical commodities accounted for at the lower of cost or fair value and unfunded credit products.

(3) Represents the netting of cash collateral paid and received by counterparties under enforceable credit support agreements. Substantially all netting of cash collateral received and paid is against OTC derivative assets and liabilities, respectively.

(4) Amounts exclude $145 million of investments measured at NAV in accordance with ASU 2015-07, *Fair Value Measurement (Topic 820): Disclosures for Investments in Certain Entities That Calculate Net Asset Value per Share (or Its Equivalent).*

(5) Because the amount of the cash collateral paid/received has not been allocated to the Level 1, 2 and 3 subtotals, these percentages are calculated based on total assets and liabilities measured at fair value on a recurring basis, excluding the cash collateral paid/received on derivatives.

Changes in Level 3 Fair Value Category

The following tables present the changes in the Level 3 fair value category for the years ended December 31, 2022 and 2021. The gains and losses presented below include changes in the fair value related to both observable and unobservable inputs.

The Company often hedges positions with offsetting positions that are classified in a different level. For example, the gains and losses for assets and liabilities in the Level 3 category presented in the tables below do not reflect the effect of offsetting losses and gains on hedging instruments that may be classified in the Level 1 and Level 2 categories. In addition, the Company hedges items classified in the Level 3 category with instruments also classified in Level 3 of the fair value hierarchy. The hedged items and related hedges are presented gross in the following tables:

Level 3 Fair Value Rollforward

In millions of dollars	Dec. 31, 2021	Net realized/unrealized gains (losses) included in[1]		Transfers		Purchases	Issuances	Sales	Settlements	Dec. 31, 2022	Unrealized gains (losses) still held[3]
		Principal transactions	Other[1][2]	into Level 3	out of Level 3						
Assets											
Securities borrowed and purchased under agreements to resell	$ 231	$ 12	$ —	$ 3	$ —	$ 252	$ —	$ —	$ (349)	$ 149	$ 18
Trading non-derivative assets											
Trading mortgage-backed securities											
U.S. government-sponsored agency guaranteed	496	(81)	—	244	(475)	969	—	(553)	—	600	(59)
Residential	104	(5)	—	112	(87)	187	—	(145)	—	166	(1)
Commercial	81	(13)	—	167	(78)	37	—	(49)	—	145	(3)
Total trading mortgage-backed securities	$ 681	$ (99)	$ —	$ 523	$ (640)	$ 1,193	$ —	$ (747)	$ —	$ 911	$ (63)
U.S. Treasury and federal agency securities	$ 4	$ (4)	$ —	$ 2	$ (1)	$ 1	$ —	$ —	$ (1)	$ 1	$ (1)
State and municipal	37	9	—	77	(35)	16	—	(97)	—	7	—
Foreign government	23	(41)	—	308	(326)	248	—	(93)	—	119	(22)
Corporate	412	101	—	499	(451)	1,068	—	(1,235)	—	394	(136)
Marketable equity securities	174	45	—	161	(105)	155	—	(238)	—	192	(42)
Asset-backed securities	613	(41)	—	243	(239)	835	—	(743)	—	668	(36)
Other trading assets	576	249	—	407	(594)	774	27	(779)	(12)	648	(122)
Total trading non-derivative assets	$ 2,520	$ 219	$ —	$ 2,220	$ (2,391)	$ 4,290	$ 27	$ (3,932)	$ (13)	$ 2,940	$ (422)
Trading derivatives, net[4]											
Interest rate contracts	$ 1,726	$ 176	$ —	$ 33	$ (792)	$ (163)	$ 7	$ 79	$ (711)	$ 355	$ (588)
Foreign exchange contracts	(89)	734	—	(422)	(22)	124	20	(459)	164	50	(81)
Equity contracts	(2,140)	1,604	—	(572)	673	176	—	(370)	(475)	(1,104)	1,057
Commodity contracts	422	822	—	194	(716)	100	—	(211)	(333)	278	413
Credit derivatives	(31)	(266)	—	(7)	131	(36)	—	—	52	(157)	(198)
Total trading derivatives, net[4]	$ (112)	$ 3,070	$ —	$ (774)	$ (726)	$ 201	$ 27	$ (961)	$ (1,303)	$ (578)	$ 603

Table continues on the next page.

In millions of dollars	Dec. 31, 2021	Net realized/unrealized gains (losses) included in[1]		Transfers		Purchases	Issuances	Sales	Settlements	Dec. 31, 2022	Unrealized gains (losses) still held[3]
		Principal transactions	Other[1][2]	into Level 3	out of Level 3						
Investments											
Mortgage-backed securities											
U.S. government-sponsored agency guaranteed	$ 51	$ —	$ (7)	$ 1	$ (10)	$ 7	$ —	$ (12)	$ —	$ 30	$ (24)
Residential	94	—	(5)	—	(42)	3	—	(9)	—	41	(5)
Commercial	—	—	—	—	—	—	—	—	—	—	—
Total investment mortgage-backed securities	$ 145	$ —	$ (12)	$ 1	$ (52)	$ 10	$ —	$ (21)	$ —	$ 71	$ (29)
U.S. Treasury and federal agency securities	$ 1	$ —	$ (1)	$ —	$ —	$ —	$ —	$ —	$ —	$ —	$ —
State and municipal	772	—	(65)	82	(164)	2	—	(41)	—	586	(49)
Foreign government	786	—	(72)	256	(276)	706	—	(792)	—	608	(23)
Corporate	188	—	(4)	197	(4)	24	—	(58)	—	343	(2)
Marketable equity securities	16	—	(7)	—	—	1	—	—	—	10	—
Asset-backed securities	3	—	22	41	(1)	—	—	(64)	—	1	(5)
Other debt securities	—	—	—	—	—	82	—	(82)	—	—	—
Non-marketable equity securities	316	—	(11)	11	(12)	155	—	(29)	—	430	4
Total investments	$ 2,227	$ —	$ (150)	$ 588	$ (509)	$ 980	$ —	$ (1,087)	$ —	$ 2,049	$ (104)
Loans	$ 711	$ —	$ 15	$ 426	$ (208)	$ —	$ 569	$ —	$ (152)	$ 1,361	$ 145
Mortgage servicing rights	404	—	201	—	—	—	120	—	(60)	665	199
Other financial assets measured on a recurring basis	73	—	(12)	29	(26)	46	39	(26)	(66)	57	—
Liabilities											
Interest-bearing deposits	$ 183	$ —	$ 6	$ 8	$ (122)	$ —	$ 20	$ —	$ (68)	$ 15	$ —
Securities loaned and sold under agreements to repurchase	643	86	—	3	(3)	453	196	—	(175)	1,031	7
Trading account liabilities											
Securities sold, not yet purchased	65	2	—	55	(36)	135	—	—	(167)	50	(65)
Other trading liabilities	—	(3)	—	—	—	—	—	—	—	3	—
Short-term borrowings	105	109	—	46	(69)	—	96	—	(31)	38	(14)
Long-term debt	25,509	9,796	—	9,873	(7,612)	—	18,847	—	(704)	36,117	7,805
Other financial liabilities measured on a recurring basis	1	—	(6)	5	(5)	—	2	—	(7)	2	—

(1) Net realized/unrealized gains (losses) are presented as increase (decrease) to Level 3 assets, and as (increase) decrease to Level 3 liabilities. Changes in fair value of available-for-sale debt securities are recorded in *AOCI*, unless related to credit impairment, while gains and losses from sales are recorded in *Realized gains (losses) from sales of investments* in the Consolidated Statement of Income.

(2) Unrealized gains (losses) on MSRs are recorded in *Other revenue* in the Consolidated Statement of Income.

(3) Represents the amount of total gains or losses for the period, included in earnings (and *AOCI* for changes in fair value of available-for-sale debt securities and DVA on fair value option liabilities), attributable to the change in fair value relating to assets and liabilities classified as Level 3 that are still held at December 31, 2022.

(4) Total Level 3 trading derivative assets and liabilities have been netted in these tables for presentation purposes only.

In millions of dollars	Dec. 31, 2020	Net realized/unrealized gains (losses) included in[1]		Transfers		Purchases	Issuances	Sales	Settlements	Dec. 31, 2021	Unrealized gains (losses) still held[3]
		Principal transactions	Other[1][2]	into Level 3	out of Level 3						
Assets											
Securities borrowed and purchased under agreements to resell	$ 320	$ (36)	$ —	$ 45	$ (49)	$ 362	$ —	$ —	$ (411)	$ 231	$ —
Trading non-derivative assets											
Trading mortgage-backed securities											
U.S. government-sponsored agency guaranteed	27	8	—	355	(131)	447	—	(210)	—	496	11
Residential	340	25	—	89	(96)	282	—	(536)	—	104	13
Commercial	136	23	—	96	(58)	62	—	(178)	—	81	—
Total trading mortgage-backed securities	$ 503	$ 56	$ —	$ 540	$ (285)	$ 791	$ —	$ (924)	$ —	$ 681	$ 24
U.S. Treasury and federal agency securities	$ —	$ —	$ —	$ 4	$ —	$ —	$ —	$ —	$ —	$ 4	$ —
State and municipal	94	(4)	—	20	(29)	17	—	(61)	—	37	(6)
Foreign government	51	29	—	143	(129)	83	—	(154)	—	23	(2)
Corporate	375	74	—	461	(384)	867	—	(981)	—	412	(38)
Marketable equity securities	73	67	—	156	(52)	118	—	(188)	—	174	23
Asset-backed securities	1,606	371	—	173	(297)	1,313	—	(2,553)	—	613	(43)
Other trading assets	945	97	—	158	(457)	980	4	(1,147)	(4)	576	(37)
Total trading non-derivative assets	$ 3,647	$ 690	$ —	$ 1,655	$ (1,633)	$ 4,169	$ 4	$ (6,008)	$ (4)	$ 2,520	$ (79)
Trading derivatives, net[4]											
Interest rate contracts	$ 1,614	$ (376)	$ —	$ 102	$ 562	$ 27	$ (84)	$ —	$ (119)	$ 1,726	$ 4
Foreign exchange contracts	52	(8)	—	(57)	104	220	—	(326)	(74)	(89)	7
Equity contracts	(3,213)	964	—	(1,101)	1,923	364	—	(364)	(713)	(2,140)	(729)
Commodity contracts	292	474	—	174	(454)	162	—	(238)	12	422	261
Credit derivatives	48	(136)	—	(96)	40	—	—	—	113	(31)	(130)
Total trading derivatives, net[4]	$ (1,207)	$ 918	$ —	$ (978)	$ 2,175	$ 773	$ (84)	$ (928)	$ (781)	$ (112)	$ (587)
Investments											
Mortgage-backed securities											
U.S. government-sponsored agency guaranteed	$ 30	$ —	$ 2	$ 42	$ (10)	$ 3	$ —	$ (16)	$ —	$ 51	$ 2
Residential	—	—	—	54	(12)	52	—	—	—	94	(1)
Commercial	—	—	—	—	—	—	—	—	—	—	—
Total investment mortgage-backed securities	$ 30	$ —	$ 2	$ 96	$ (22)	$ 55	$ —	$ (16)	$ —	$ 145	$ 1
U.S. Treasury and federal agency securities	$ —	$ —	$ —	$ 1	$ —	$ —	$ —	$ —	$ —	$ 1	$ —
State and municipal	834	—	(21)	58	(108)	49	—	(40)	—	772	(12)
Foreign government	268	—	(49)	512	(565)	871	—	(251)	—	786	(2)
Corporate	60	—	(14)	183	(44)	37	—	(34)	—	188	2
Marketable equity securities	—	—	—	16	—	—	—	—	—	16	—
Asset-backed securities	1	—	(21)	36	—	—	—	(13)	—	3	(2)
Other debt securities	—	—	—	—	—	—	—	—	—	—	—
Non-marketable equity securities	349	—	(27)	2	—	—	—	(8)	—	316	(6)
Total investments	$ 1,542	$ —	$ (130)	$ 904	$ (739)	$ 1,012	$ —	$ (362)	$ —	$ 2,227	$ (19)

Table continues on the next page.

In millions of dollars	Dec. 31, 2020	Net realized/unrealized gains (losses) included in[1] Principal transactions	Other[1][2]	Transfers into Level 3	Transfers out of Level 3	Purchases	Issuances	Sales	Settlements	Dec. 31, 2021	Unrealized gains (losses) still held[3]
Loans	$ 1,985	$ —	$ 90	$ 311	$ (2,071)	$ —	$ 529	$ —	$ (133)	$ 711	$ (77)
Mortgage servicing rights	336	—	43	—	—	—	92	—	(67)	404	52
Other financial assets measured on a recurring basis	—	—	6	65	(27)	58	—	(26)	(3)	73	—
Liabilities											
Interest-bearing deposits	$ 206	$ —	$ (18)	$ —	$ (44)	$ —	$ 38	$ —	$ (35)	$ 183	$ (19)
Securities loaned and sold under agreements to repurchase	631	(9)	—	183	(483)	488	—	—	(185)	643	32
Trading account liabilities											
Securities sold, not yet purchased	214	48	—	87	(34)	59	—	—	(213)	65	(4)
Other trading liabilities	26	26	—	—	—	—	—	—	—	—	—
Short-term borrowings	219	43	—	137	(57)	—	49	—	(200)	105	(2)
Long-term debt	25,210	2,774	—	8,611	(9,771)	—	10,262	—	(6,029)	25,509	1,756
Other financial liabilities measured on a recurring basis	1	—	(3)	—	(4)	—	14	—	(13)	1	—

(1) Net realized/unrealized gains (losses) are presented as increase (decrease) to Level 3 assets, and as (increase) decrease to Level 3 liabilities. Changes in fair value of available-for-sale debt securities are recorded in *AOCI*, unless related to credit impairment, while gains and losses from sales are recorded in *Realized gains (losses) from sales of investments* in the Consolidated Statement of Income.

(2) Unrealized gains (losses) on MSRs are recorded in *Other revenue* in the Consolidated Statement of Income.

(3) Represents the amount of total gains or losses for the period, included in earnings (and *AOCI* for changes in fair value of available-for-sale debt securities and DVA on fair value option liabilities), attributable to the change in fair value relating to assets and liabilities classified as Level 3 that are still held at December 31, 2021.

(4) Total Level 3 derivative assets and liabilities have been netted in these tables for presentation purposes only.

Level 3 Fair Value Transfers

The following were the significant Level 3 transfers for the period December 31, 2021 to December 31, 2022:

- During the 12 months ended December 31, 2022, transfers of *Long-term debt* were $9.9 billion from Level 2 to Level 3. Of the $9.9 billion transfer in, approximately $7.0 billion related to interest rate option volatility inputs becoming unobservable and/or significant relative to their overall valuation, and $2.9 billion related to equity and credit derivative inputs (in addition to other volatility inputs, e.g., interest rate volatility inputs) becoming unobservable and/or significant to their overall valuation. In other instances, market changes have resulted in some inputs becoming more observable, and some unobservable inputs becoming less significant to the overall valuation of the instruments (e.g., when an option becomes deep-in or deep-out of the money). This has resulted in $7.6 billion of certain structured long-term debt products being transferred from Level 3 to Level 2 during the 12 months ended December 31, 2022.

The following were the significant Level 3 transfers for the period December 31, 2020 to December 31, 2021:

- During the 12 months ended December 31, 2021, transfers of *Loans* of $2.1 billion from Level 3 to Level 2 were primarily driven by equity forward and volatility inputs that have been assessed as not significant to the overall valuation of certain hybrid loan instruments, including equity options and long dated equity call spreads.
- During the 12 months ended December 31, 2021, transfers of *Equity contracts* of $1.1 billion from Level 2 to Level 3 were due to equity forward and volatility inputs becoming an unobservable and/or significant input relative to the overall valuation of equity options and equity swaps. In other instances, market changes have resulted in observable equity forward and volatility inputs becoming an insignificant input to the overall valuation of the instrument (e.g., when an option becomes deep-in or deep-out of the money). This has resulted in $1.9 billion of certain equity contracts being transferred from Level 3 to Level 2.
- During the 12 months ended December 31, 2021, transfers of *Long-term debt* were $8.6 billion from Level 2 to Level 3. Of the $8.6 billion transfer in, approximately $7.2 billion related to interest rate option volatility inputs becoming unobservable and/or significant relative to their overall valuation, and $1.0 billion related to equity volatility inputs (in addition to other volatility inputs, e.g., interest rate volatility inputs) becoming unobservable and/or significant to their overall valuation. In other instances, market changes have resulted in some inputs becoming more observable, and some unobservable inputs becoming less significant to the overall valuation of the instruments (e.g., when an option becomes deep-in or deep-out of the money). This has resulted in $9.8 billion of certain structured long-term debt products being transferred from Level 3 to Level 2 during the 12 months ended December 31, 2021.

Valuation Techniques and Inputs for Level 3 Fair Value Measurements

The Company's Level 3 inventory consists of both cash instruments and derivatives of varying complexity.

The following tables present the valuation techniques covering the majority of Level 3 inventory and the most significant unobservable inputs used in Level 3 fair value measurements. Methodologies are applied consistently. Changes in listed inputs period versus period represent variables that become more, or less, significant, hence their addition or removal from the table below. Differences between this table and amounts presented in the Level 3 Fair Value Rollforward table above represent individually immaterial items that have been measured using a variety of valuation techniques other than those listed.

As of December 31, 2022	Fair value[1] *(in millions)*	Methodology	Input	Low[2][3]	High[2][3]	Weighted average[4]
Assets						
Securities borrowed and purchased under agreements to resell	$ 146	Model-based	Credit spread	15 bps	15 bps	15 bps
			Interest rate	2.61 %	2.61 %	2.61 %
Mortgage-backed securities	$ 228	Price-based	Price	$ 1.04	$ 99.71	$ 51.51
	732	Yield analysis	Yield	4.41 %	20.30 %	9.74 %
State and municipal, foreign government, corporate and other debt securities	$ 2,360	Price-based	Price	$ 0.01	$ 994.68	$ 245.85
Marketable equity securities[5]	$ 147	Price-based	Price	$ —	$ 9,087.76	$ 114.29
	31	Model-based	WAL	2.24 years	2.24 years	2.24 years
			Recovery *(in millions)*	$ 7,148	$ 7,148	$ 7,148
Asset-backed securities	$ 304	Price-based	Price	$ 10.50	$ 145.00	$ 74.97
	308	Yield analysis	Yield	5.76 %	18.58 %	9.34 %
Non-marketable equities	$ 287	Comparables analysis	Illiquidity discount	8.60 %	17.00 %	10.16 %
	101	Price-based	PE ratio	14.00x	15.70x	15.16x
			Cost of capital	8.10 %	17.50 %	10.44 %
			Revenue multiple	3.60x	13.90x	12.40x
Derivatives—gross[6]						
Interest rate contracts (gross)	$ 7,108	Model-based	IR normal volatility	0.33 %	1.82 %	0.96 %
Foreign exchange contracts (gross)	$ 1,437	Model-based	IR normal volatility	0.33 %	1.47 %	0.67 %
			IR Basis	(4.23)%	9.68 %	(0.03)%
			Equity volatility	0.05 %	300.72 %	33.91 %
			Credit spread	116 bps	626 bps	594 bps
Equity contracts (gross)[7]	$ 4,430	Model-based	Equity volatility	0.05 %	300.72 %	41.47 %
			Equity forward	68.34 %	271.61 %	103.50 %
			Equity-FX correlation	(95.00)%	50.00 %	(16.33)%
			Equity-Equity correlation	(3.98)%	98.68 %	85.63 %
			WAL	2.24 years	2.24 years	2.24 years
			Recovery *(in millions)*	$7,148	$7,148	$7,148
			Equity-IR correlation	(18.83)%	60.00 %	32.37 %
Commodity and other contracts (gross)	$ 2,724	Model-based	Forward price	14.27 %	385.50 %	106.08 %
			Commodity volatility	10.43 %	151.50 %	33.55 %
			Commodity correlation	(32.00)%	91.94 %	36.70 %
Credit derivatives (gross)	$ 1,520	Model-based	Credit spread	2.50 bps	955.10 bps	101.27 bps
	439	Price-based	Recovery rate	25.00 %	75.00 %	42.27 %
			Credit correlation	25.00 %	80.00 %	42.38 %
			Price	$ 31.71	$ 99.00	$ 78.75

As of December 31, 2022	Fair value[1] *(in millions)*	Methodology	Input	Low[2][3]	High[2][3]	Weighted average[4]
			Credit spread volatility	35.58 %	64.79 %	40.47 %
Non-trading derivatives and other financial assets and liabilities measured on a recurring basis (gross)	$ 57	Price-based	Price	$ 80.16	$ 105.32	$ 92.65
Loans and leases	$ 1,059	Model-based	Equity volatility	0.05 %	300.72 %	42.62 %
	304	Price-based	Forward price	14.27 %	324.85 %	105.07 %
			Price	$0.01	$100.53	$84.77
			Equity forward	68.34 %	271.61 %	103.49 %
Mortgage servicing rights	$ 580	Cash flow	Yield	(0.40)%	13.20 %	5.36 %
	84	Model-based	WAL	3.92 years	9.33 years	7.71 years
Liabilities						
Interest-bearing deposits	$ 15	Model-based	Forward price	100.00 %	101.30 %	100.07 %
Securities loaned and sold under agreements to repurchase	$ 970	Model-based	Interest rate	4.01 %	4.97 %	4.07 %
Trading account liabilities						
Securities sold, not yet purchased and other trading liabilities	$ 47	Price-based	Price	$ —	$ 9,087.76	$ 41.22
	6	Model-based	FX volatility	2.00 %	40.00 %	12.85 %
Short-term borrowings and long-term debt	$ 36,155	Model-based	IR normal volatility	0.33 %	1.82 %	0.89 %

As of December 31, 2021	Fair value[1] *(in millions)*	Methodology	Input	Low[2][3]	High[2][3]	Weighted average[4]
Assets						
Securities borrowed and purchased under agreements to resell	$ 231	Model-based	Credit spread	15 bps	15 bps	15 bps
			Interest rate	0.26 %	0.72 %	0.50 %
Mortgage-backed securities	$ 279	Price-based	Price	$ 4	$ 118	$ 79
	526	Yield analysis	Yield	1.43 %	23.79 %	7.25 %
State and municipal, foreign government, corporate and other debt securities	$ 2,264	Price-based	Price	$ —	$ 995	$ 193
	415	Model-based	Equity volatility	0.08 %	290.64 %	53.94 %
Marketable equity securities[5]	$ 128	Price-based	Price	$ —	$ 73,000	$ 6,477
	43	Model-based	WAL	1.73 years	1.73 years	1.73 years
			Recovery *(in millions)*	$ 7,148	$ 7,148	$ 7,148
Asset-backed securities	$ 386	Price-based	Price	$ 5	$ 754	$ 87
	208	Yield analysis	Yield	2.43 %	19.35 %	8.18 %
Non-marketable equities	$ 121	Price-based	Illiquidity discount	10.00 %	36.00 %	26.43 %
	112	Comparables analysis	PE ratio	11.00x	29.00x	15.42x
	83	Model-based	Price	$ 3	$ 2,601	$ 2,029
			Adjustment factor	0.33x	0.44x	0.34x
			Revenue multiple	19.80x	30.00x	20.48x
			Cost of capital	17.50 %	20.00 %	17.57 %
Derivatives—gross[6]						
Interest rate contracts (gross)	$ 6,054	Model-based	IR normal volatility	0.24 %	0.94 %	0.70 %
Foreign exchange contracts (gross)	$ 1,364	Model-based	IR normal volatility	0.24 %	0.74 %	0.58 %
			FX volatility	2.13 %	107.42 %	11.21 %

As of December 31, 2021	Fair value[1] *(in millions)*	Methodology	Input	Low[2][3]	High[2][3]	Weighted average[4]
			Credit spread	140 bps	696 bps	639 bps
Equity contracts (gross)[7]	$ 4,690	Model-based	Equity volatility	0.08 %	290.64 %	47.67 %
			Equity forward	57.99 %	165.83 %	89.45 %
			Equity-FX correlation	(95.00)%	80.00 %	(16.00)%
			Equity-Equity correlation	(6.49)%	99.00 %	85.61 %
Commodity and other contracts (gross)	$ 3,172	Model-based	Forward price	8.00 %	599.44 %	123.22 %
			Commodity volatility	10.87 %	188.30 %	26.85 %
			Commodity correlation	(50.52)%	89.83 %	(7.11)%
Credit derivatives (gross)	$ 1,480	Model-based	Credit spread	1.00 bps	874.72 bps	68.83 bps
	427	Price-based	Recovery rate	20.00 %	75.00 %	44.72 %
			Upfront points	2.74 %	99.96 %	59.37 %
			Price	$ 40	$ 103	$ 80
			Credit correlation	30.00 %	80.00 %	54.57 %
Non-trading derivatives and other financial assets and liabilities measured on a recurring basis (gross)	$ 69	Price-based	Price	$ 94	$ 2,598	$ 591
Loans and leases	$ 691	Model-based	Equity volatility	22.48 %	85.44 %	50.56 %
			Forward price	26.95 %	333.08 %	106.97 %
			Commodity volatility	10.87 %	188.30 %	26.85 %
			Commodity correlation	(50.52)%	89.83 %	(7.11)%
Mortgage servicing rights	$ 331	Cash flow	Yield	(1.20)%	12.10 %	4.51 %
	73	Model-based	WAL	2.75 years	5.86 years	5.14 years
Liabilities						
Interest-bearing deposits	$ 183	Model-based	IR normal volatility	0.34 %	0.88 %	0.68 %
			Equity volatility	0.08 %	290.64 %	54.05 %
			Equity forward	57.99 %	165.83 %	89.39 %
Securities loaned and sold under agreements to repurchase	$ 643	Model-based	Interest rate	0.12 %	1.95 %	1.47 %
Trading account liabilities						
Securities sold, not yet purchased and other trading liabilities	$ 63	Price-based	Price	$ —	$ 12,875	$ 1,707
Short-term borrowings and long-term debt	$ 25,514	Model-based	IR normal volatility	0.07 %	0.88 %	0.60 %
			Equity volatility	0.08 %	290.64 %	53.21 %
			Equity-IR correlation	(3.53)%	60.00 %	32.12 %
			Equity-FX correlation	(95.00)%	80.00 %	(15.98)%
			FX volatility	0.06 %	41.76 %	9.38 %

(1) The tables above include the fair values for the items listed and may not foot to the total population for each category.
(2) Some inputs are shown as zero due to rounding.
(3) When the low and high inputs are the same, there is either a constant input applied to all positions, or the methodology involving the input applies to only one large position.
(4) Weighted averages are calculated based on the fair values of the instruments.
(5) For equity securities, the price inputs are expressed on an absolute basis, not as a percentage of the notional amount.
(6) Both trading and non-trading account derivatives—assets and liabilities—are presented on a gross absolute value basis.
(7) Includes hybrid products.

Uncertainty of Fair Value Measurements Relating to Unobservable Inputs

Valuation uncertainty arises when there is insufficient or dispersed market data to allow a precise determination of the exit value of a fair-valued position or portfolio in today's market. This is especially prevalent in Level 3 fair value instruments, where uncertainty exists in valuation inputs that may be both unobservable and significant to the instrument's (or portfolio's) overall fair value measurement. The uncertainties associated with key unobservable inputs on the Level 3 fair value measurements may not be independent of one another. In addition, the amount and direction of the uncertainty on a fair value measurement for a given change in an unobservable input depends on the nature of the instrument as well as whether the Company holds the instrument as an asset or a liability. For certain instruments, the pricing, hedging and risk management are sensitive to the correlation between various inputs rather than on the analysis and aggregation of the individual inputs.

The following section describes some of the most significant unobservable inputs used by the Company in Level 3 fair value measurements.

Correlation

Correlation is a measure of the extent to which two or more variables change in relation to each other. A variety of correlation-related assumptions are required for a wide range of instruments, including equity and credit baskets, foreign exchange options, Credit Index Tranches and many other instruments. For almost all of these instruments, correlations are not directly observable in the market and must be calculated using alternative sources, including historical information. Estimating correlation can be especially difficult where it may vary over time, and calculating correlation information from market data requires significant assumptions regarding the informational efficiency of the market (e.g., swaption markets). Uncertainty therefore exists when an estimate of the appropriate level of correlation as an input into some fair value measurements is required.

Changes in correlation levels can have a substantial impact, favorable or unfavorable, on the value of an instrument, depending on its nature. A change in the default correlation of the fair value of the underlying bonds comprising a CDO structure would affect the fair value of the senior tranche. For example, an increase in the default correlation of the underlying bonds would reduce the fair value of the senior tranche, because highly correlated instruments produce greater losses in the event of default and a portion of these losses would become attributable to the senior tranche. That same change in default correlation would have a different impact on junior tranches of the same structure.

Volatility

Volatility represents the speed and severity of market price changes and is a key factor in pricing options. Volatility generally depends on the tenor of the underlying instrument and the strike price or level defined in the contract. Volatilities for certain combinations of tenor and strike are not observable and need to be estimated using alternative methods, such as comparable instruments, historical analysis or other sources of market information. This leads to uncertainty around the final fair value measurement of instruments with unobservable volatilities.

The general relationship between changes in the value of an instrument (or a portfolio) to changes in volatility also depends on changes in interest rates and the level of the underlying index. Generally, long option positions (assets) benefit from increases in volatility, whereas short option positions (liabilities) will suffer losses. Some instruments are more sensitive to changes in volatility than others. For example, an at-the-money option would experience a greater percentage change in its fair value than a deep-in-the-money option. In addition, the fair value of an option with more than one underlying security (e.g., an option on a basket of equities) depends on the volatility of the individual underlying securities as well as their correlations.

Yield

In some circumstances, the yield of an instrument is not observable in the market and must be estimated from historical data or from yields of similar securities. This estimated yield may need to be adjusted to capture the characteristics of the security being valued. Whenever the amount of the adjustment is significant to the value of the security, the fair value measurement is classified as Level 3.

Adjusted yield is generally used to discount the projected future principal and interest cash flows on instruments, such as asset-backed securities. Adjusted yield is impacted by changes in the interest rate environment and relevant credit spreads.

Prepayment

Voluntary unscheduled payments (prepayments) change the future cash flows for the investor and thereby change the fair value of the security. The effect of prepayments is more pronounced for residential mortgage-backed securities. Prepayment is generally negatively correlated with delinquency and interest rate. A combination of low prepayments and high delinquencies amplifies each input's negative impact on a mortgage security's valuation. As prepayment speeds change, the weighted average life of the security changes, which impacts the valuation either positively or negatively, depending upon the nature of the security and the direction of the change in the weighted average life.

Recovery

Recovery is the proportion of the total outstanding balance of a bond or loan that is expected to be collected in a liquidation scenario. For many credit securities (e.g., commercial mortgage-backed securities), the expected recovery amount of a defaulted property is typically unknown until a liquidation of the property is imminent. The assumed recovery of a security may differ from its actual recovery that will be observable in the future. Generally, an increase in the recovery rate assumption increases the fair value of the security. An increase in loss severity, the inverse of the recovery rate, reduces the amount of principal available for distribution and, as a result, decreases the fair value of the security.

Credit Spread

Credit spread is a component of the security representing its credit quality. Credit spread reflects the market perception of changes in prepayment, delinquency and recovery rates, therefore capturing the impact of other variables on the fair value. Changes in credit spread affect the fair value of securities differently depending on the characteristics and maturity profile of the security. For example, credit spread is a more significant driver of the fair value measurement of a high-yield bond as compared to an investment-grade bond. Generally, the credit spread for an investment-grade bond is also more observable and less volatile than its high-yield counterpart.

Items Measured at Fair Value on a Nonrecurring Basis

Certain assets and liabilities are measured at fair value on a nonrecurring basis and, therefore, are not included in the tables above. These include assets measured at cost that have been written down to fair value during the periods as a result of an impairment. These also include non-marketable equity securities that have been measured using the measurement alternative and are either (i) written down to fair value during the periods as a result of an impairment or (ii) adjusted upward or downward to fair value as a result of a transaction observed during the periods for an identical or similar investment in the same issuer. In addition, these assets include loans held-for-sale and other real estate owned that are measured at the lower of cost or market value.

The following tables present the carrying amounts of all assets that were still held for which a nonrecurring fair value measurement was recorded:

In millions of dollars	**Fair value**	**Level 2**	**Level 3**
December 31, 2022			
Loans HFS[(1)]	**$ 2,336**	**$ 457**	**$ 1,879**
Other real estate owned	**1**	**—**	**1**
Loans[(2)]	**69**	**—**	**69**
Non-marketable equity securities measured using the measurement alternative	**597**	**—**	**597**
Total assets at fair value on a nonrecurring basis	**$ 3,003**	**$ 457**	**$ 2,546**

In millions of dollars	Fair value	Level 2	Level 3
December 31, 2021			
Loans HFS[(1)]	$ 2,298	$ 986	$ 1,312
Other real estate owned	11	—	11
Loans[(2)]	144	—	144
Non-marketable equity securities measured using the measurement alternative	655	104	551
Total assets at fair value on a nonrecurring basis	$ 3,108	$ 1,090	$ 2,018

(1) Net of fair value amounts on the unfunded portion of loans HFS recognized as *Other liabilities* on the Consolidated Balance Sheet.

(2) Represents impaired loans held for investment whose carrying amount is based on the fair value of the underlying collateral less costs to sell, primarily real estate.

The fair value of loans HFS is determined where possible using quoted secondary-market prices. If no such quoted price exists, the fair value of a loan is determined using quoted prices for a similar asset or assets, adjusted for the specific attributes of that loan. Fair value for the other real estate owned is based on appraisals. For loans whose carrying amount is based on the fair value of the underlying collateral, the fair values depend on the type of collateral. Fair value of the collateral is typically estimated based on quoted market prices if available, appraisals or other internal valuation techniques.

Where the fair value of the related collateral is based on an appraised value, the loan is generally classified as Level 3. In addition, for corporate loans, appraisals of the collateral are often based on sales of similar assets; however, because the prices of similar assets require significant adjustments to reflect the unique features of the underlying collateral, these fair value measurements are generally classified as Level 3.

The fair value of non-marketable equity securities under the measurement alternative is based on observed transaction prices for the identical or similar investment of the same issuer, or an internal valuation technique in the case of an impairment. Where there are insufficient market observations to conclude the inputs are observable, where significant adjustments are made to the observed transaction prices or when an internal valuation technique is used, the security is classified as Level 3. Fair value may differ from the observed transaction price due to a number of factors, including marketability adjustments and differences in rights and obligations when the observed transaction is not for the identical investment held by Citi.

Valuation Techniques and Inputs for Level 3 Nonrecurring Fair Value Measurements

The following tables present the valuation techniques covering the majority of Level 3 nonrecurring fair value measurements and the most significant unobservable inputs used in those measurements:

As of December 31, 2022	Fair value[1] *(in millions)*	Methodology	Input	Low[2]	High	Weighted average[3]
Loans held-for-sale	$ 1,830	Price-based	Price	$ 0.88	$ 100.23	$ 65.91
Other real estate owned	$ 1	Price-based	Appraised value[4]	$ 30,000	$ 441,750	$ 310,552
Loans[5]	$ 45	Recovery analysis	Appraised value[4]	$ 12,000	$ 14,022,820	$ 3,714,342
	24	Appraised value				
Non-marketable equity securities measured using the measurement alternative	$ 234		Revenue multiple	4.95x	73.10x	19.68x
	363		Price	$ 0.46	$ 2,416.43	$ 557.86

As of December 31, 2021	Fair value[1] *(in millions)*	Methodology	Input	Low[2]	High	Weighted average[3]
Loans held-for-sale	$ 1,312	Price-based	Price	$ 89	$ 100	$ 99
Other real estate owned	$ 4	Price-based	Appraised value[4]	$ 14,000	$ 2,392,464	$ 1,660,120
	5	Recovery analysis				
Loans[5]	$ 120	Recovery analysis	Appraised value[4]	$ 10,000	$ 3,900,000	$ 247,018
	24	Price-based	Price	$ 3	$ 75	$ 35
			Recovery rate	84.00 %	100.00 %	84.00 %
Non-marketable equity securities measured using the measurement alternative	$ 551	Price-based	Price	$ 6	$ 1,339	$ 52

(1) The table above includes the fair values for the items listed and may not foot to the total population for each category.
(2) Some inputs are shown as zero due to rounding.
(3) Weighted averages are calculated based on the fair values of the instruments.
(4) Appraised values are disclosed in whole dollars.
(5) Represents impaired loans held for investment whose carrying amount is based on the fair value of the underlying collateral less costs to sell, primarily real estate.

Nonrecurring Fair Value Changes

The following tables present total nonrecurring fair value measurements for the period, included in earnings, attributable to the change in fair value relating to assets that were still held:

	Year ended December 31,	
In millions of dollars	2022	2021
Loans HFS	$ (58)	$ (31)
Other real estate owned	—	—
Loans[1]	13	9
Non-marketable equity securities measured using the measurement alternative	315	468
Total nonrecurring fair value gains (losses)	$ 270	$ 446

(1) Represents loans held for investment whose carrying amount is based on the fair value of the underlying collateral less costs to sell, primarily real estate.

Estimated Fair Value of Financial Instruments Not Carried at Fair Value

The following tables present the carrying value and fair value of Citigroup's financial instruments that are not carried at fair value. The tables below therefore exclude items measured at fair value on a recurring basis presented in the tables above.

The disclosure also excludes leases, affiliate investments, pension and benefit obligations, certain insurance contracts and tax-related items. Also, as required, the disclosure excludes the effect of taxes, any premium or discount that could result from offering for sale at one time the entire holdings of a particular instrument, excess fair value associated with deposits with no fixed maturity and other expenses that would be incurred in a market transaction. In addition, the tables exclude the values of non-financial assets and liabilities, as well as a wide range of franchise, relationship and intangible values, which are integral to a full assessment of Citigroup's financial position and the value of its net assets.

Fair values vary from period to period based on changes in a wide range of factors, including interest rates, credit quality and market perceptions of value, and as existing assets and liabilities run off and new transactions are entered into.

	December 31, 2022		Estimated fair value		
In billions of dollars	Carrying value	Estimated fair value	Level 1	Level 2	Level 3
Assets					
Investments, net of allowance	$ 274.3	$ 249.2	$ 123.2	$ 123.1	$ 2.9
Securities borrowed and purchased under agreements to resell	125.9	125.9	—	125.9	—
Loans[1][2]	634.5	634.9	—	—	634.9
Other financial assets[2][3]	427.1	427.1	320.0	22.0	85.1
Liabilities					
Deposits	$ 1,364.1	$ 1,345.4	$ —	$ 1,159.4	$ 186.0
Securities loaned and sold under agreements to repurchase	131.6	131.6	—	131.6	—
Long-term debt[4]	165.6	160.5	—	151.1	9.4
Other financial liabilities[5]	142.4	142.4	—	26.5	115.9

	December 31, 2021		Estimated fair value		
In billions of dollars	Carrying value	Estimated fair value	Level 1	Level 2	Level 3
Assets					
Investments, net of allowance	$ 221.9	$ 221.0	$ 111.8	$ 106.4	$ 2.8
Securities borrowed and purchased under agreements to resell	110.8	110.8	—	106.4	4.4
Loans[1][2]	644.8	659.6	—	—	659.6
Other financial assets[2][3]	351.9	351.9	242.1	19.9	89.9
Liabilities					
Deposits	$ 1,315.6	$ 1,316.2	$ —	$ 1,153.9	$ 162.3
Securities loaned and sold under agreements to repurchase	134.6	134.6	—	134.5	0.1
Long-term debt[4]	171.8	184.6	—	171.9	12.7
Other financial liabilities[5]	111.1	111.1	—	17.0	94.1

(1) The carrying value of loans is net of the allowance for credit losses on loans of $17.0 billion for December 31, 2022 and $16.5 billion for December 31, 2021. In addition, the carrying values exclude $0.4 billion and $0.5 billion of lease finance receivables at December 31, 2022 and 2021 respectively.
(2) Includes items measured at fair value on a nonrecurring basis.
(3) Includes cash and due from banks, deposits with banks, brokerage receivables, reinsurance recoverables and other financial instruments included in *Other assets* on the Consolidated Balance Sheet, for all of which the carrying value is a reasonable estimate of fair value.
(4) The carrying value includes long-term debt balances under qualifying fair value hedges.
(5) Includes brokerage payables, separate and variable accounts, short-term borrowings (carried at cost) and other financial instruments included in *Other liabilities* on the Consolidated Balance Sheet, for all of which the carrying value is a reasonable estimate of fair value.

The estimated fair values of the Company's corporate unfunded lending commitments at December 31, 2022 and 2021 were off-balance sheet liabilities of $13.7 billion and $8.1 billion, respectively, substantially all of which are classified as Level 3. The Company does not estimate the fair values of consumer unfunded lending commitments, which are generally cancellable by providing notice to the borrower.

26. FAIR VALUE ELECTIONS

The Company may elect to report most financial instruments and certain other items at fair value on an instrument-by-instrument basis with changes in fair value reported in earnings, other than DVA (see below). The election is made upon the initial recognition of an eligible financial asset, financial liability or firm commitment or when certain specified reconsideration events occur. The fair value election may not otherwise be revoked once an election is made. The changes in fair value are recorded in current earnings. Movements in DVA are reported as a component of *AOCI*. Additional discussion regarding the applicable areas in which fair value elections were made is presented in Note 25.

The Company has elected fair value accounting for its mortgage servicing rights (MSRs). See Note 22 for additional details on Citi's MSRs.

The following table presents the changes in fair value of those items for which the fair value option has been elected:

	Changes in fair value—gains (losses) for the years ended December 31,	
In millions of dollars	2022	2021
Assets		
Securities borrowed and purchased under agreements to resell	$ (109)	$ (87)
Trading account assets	(296)	59
Investments	—	—
Loans		
Certain corporate loans	(1,763)	(171)
Certain consumer loans	(1)	—
Total loans	$ (1,764)	$ (171)
Other assets		
MSRs	$ 201	$ 43
Certain mortgage loans HFS[1]	(455)	70
Total other assets	$ (254)	$ 113
Total assets	$ (2,423)	$ (86)
Liabilities		
Interest-bearing deposits	$ 42	$ (118)
Securities loaned and sold under agreements to repurchase	110	66
Trading account liabilities	(239)	17
Short-term borrowings[2]	1,424	675
Long-term debt[2]	15,589	386
Total liabilities	$ 16,926	$ 1,026

(1) Includes gains (losses) associated with interest rate lock commitments for those loans that have been originated and elected under the fair value option.
(2) Includes DVA that is included in *AOCI*. See Notes 20 and 25.

Own Debt Valuation Adjustments (DVA)

Own debt valuation adjustments are recognized on Citi's liabilities for which the fair value option has been elected using Citi's credit spreads observed in the bond market. Changes in fair value of fair value option liabilities related to changes in Citigroup's own credit spreads (DVA) are reflected as a component of *AOCI*. See Note 20 for additional information.

Among other variables, the fair value of liabilities for which the fair value option has been elected (other than non-recourse debt and similar liabilities) is impacted by the narrowing or widening of the Company's credit spreads.

The estimated changes in the fair value of these non-derivative liabilities due to such changes in the Company's own credit spread (or instrument-specific credit risk) were a gain of $2,685 million and $296 million for the years ended December 31, 2022 and 2021, respectively. Changes in fair value resulting from changes in instrument-specific credit risk were estimated by incorporating the Company's current credit spreads observable in the bond market into the relevant valuation technique used to value each liability as described above.

The Fair Value Option for Financial Assets and Financial Liabilities

Selected Portfolios of Securities Purchased Under Agreements to Resell, Securities Borrowed, Securities Sold Under Agreements to Repurchase, Securities Loaned and Certain Uncollateralized Short-Term Borrowings

The Company elected the fair value option for certain portfolios of fixed income securities purchased under agreements to resell and fixed income securities sold under agreements to repurchase, securities borrowed, securities loaned and certain uncollateralized short-term borrowings held primarily by broker-dealer entities in the United States, the United Kingdom and Japan. In each case, the election was made because the related interest rate risk is managed on a portfolio basis, primarily with offsetting derivative instruments that are accounted for at fair value through earnings.

Changes in fair value for transactions in these portfolios are recorded in *Principal transactions*. The related interest revenue and interest expense are measured based on the contractual rates specified in the transactions and are reported as *Interest revenue* and *Interest expense* in the Consolidated Statement of Income.

Certain Loans and Other Credit Products

Citigroup has also elected the fair value option for certain other originated and purchased loans, including certain unfunded loan products, such as guarantees and letters of credit, executed by Citigroup's lending and trading businesses. None of these credit products are highly leveraged financing commitments. Significant groups of transactions include loans and unfunded loan products that are expected to be either sold or securitized in the near term, or transactions where the economic risks are hedged with derivative instruments, such as purchased credit default swaps or total return swaps where the Company pays the total return on the underlying loans to a third party. Citigroup has elected the fair value option to mitigate accounting mismatches in cases where hedge accounting is complex and to achieve operational simplifications. Fair value was not elected for most lending transactions across the Company.

The following table provides information about certain credit products carried at fair value:

	December 31, 2022		December 31, 2021	
In millions of dollars	Trading assets	Loans	Trading assets	Loans
Carrying amount reported on the Consolidated Balance Sheet	$ 6,011	$ 5,360	$ 9,530	$ 6,082
Aggregate unpaid principal balance in excess of (less than) fair value	167	51	(100)	226
Balance of non-accrual loans or loans more than 90 days past due	—	2	—	1
Aggregate unpaid principal balance in excess of (less than) fair value for non-accrual loans or loans more than 90 days past due	—	1	—	—

In addition to the amounts reported above, $729 million and $719 million of unfunded commitments related to certain credit products selected for fair value accounting were outstanding as of December 31, 2022 and 2021, respectively.

Changes in the fair value of funded and unfunded credit products are classified in *Principal transactions* in Citi's Consolidated Statement of Income. Related interest revenue is measured based on the contractual interest rates and reported as *Interest revenue* on *Trading account assets* or loan interest depending on the balance sheet classifications of the credit products. The changes in fair value for the years ended December 31, 2022 and 2021 due to instrument-specific credit risk totaled to losses of $155 million and $21 million, respectively. Changes in fair value due to instrument-specific credit risk are estimated based on changes in borrower-specific credit spreads and recovery assumptions.

Certain Investments in Unallocated Precious Metals

Citigroup invests in unallocated precious metals accounts (e.g., gold, silver, platinum and palladium) as part of its commodity and foreign currency trading activities or to economically hedge certain exposures from issuing structured liabilities. Under ASC 815, the investment is bifurcated into a debt host contract and a commodity forward derivative instrument. Citigroup elects the fair value option for the debt host contract, and reports the debt host contract within *Trading account assets* on the Company's Consolidated Balance Sheet. The total carrying amount of debt host contracts across unallocated precious metals accounts was approximately $0.3 billion and $0.3 billion at December 31, 2022 and 2021, respectively. The amounts are expected to fluctuate based on trading activity in future periods.

As part of its commodity and foreign currency trading activities, Citi trades unallocated precious metals investments and executes forward purchase and forward sale derivative contracts with trading counterparties. When Citi sells an unallocated precious metals investment, Citi's receivable from its depository bank is repaid and Citi derecognizes its investment in the unallocated precious metal. The forward purchase or sale contract with the trading counterparty indexed to unallocated precious metals is accounted for as a derivative, at fair value through earnings. As of December 31, 2022, there were approximately $18.6 billion and $10.8 billion of notional amounts of such forward purchase and forward sale derivative contracts outstanding, respectively.

Certain Investments in Private Equity and Real Estate Ventures

Citigroup invests in private equity and real estate ventures for the purpose of earning investment returns and for capital appreciation. The Company has elected the fair value option for certain of these ventures, because such investments are considered similar to many private equity or hedge fund activities in Citi's investment companies, which are reported at fair value. The fair value option brings consistency in the accounting and evaluation of these investments. All investments (debt and equity) in such private equity and real estate entities are accounted for at fair value. These investments are classified as *Investments* on Citigroup's Consolidated Balance Sheet.

Changes in the fair values of these investments are classified in *Other revenue* in the Company's Consolidated Statement of Income.

Certain Mortgage Loans Held-for-Sale (HFS)

Citigroup has elected the fair value option for certain purchased and originated prime fixed-rate and conforming adjustable-rate first mortgage loans HFS. These loans are intended for sale or securitization and are hedged with derivative instruments. The Company has elected the fair value option to mitigate accounting mismatches in cases where hedge accounting is complex and to achieve operational simplifications.

The following table provides information about certain mortgage loans HFS carried at fair value:

In millions of dollars	**December 31, 2022**	December 31, 2021
Carrying amount reported on the Consolidated Balance Sheet	**$ 793**	$ 3,035
Aggregate fair value in excess of (less than) unpaid principal balance	**(10)**	70
Balance of non-accrual loans or loans more than 90 days past due	**1**	—
Aggregate unpaid principal balance in excess of fair value for non-accrual loans or loans more than 90 days past due	**—**	—

The changes in the fair values of these mortgage loans are reported in *Other revenue* in the Company's Consolidated Statement of Income. There was no net change in fair value during the years ended December 31, 2022 and 2021 due to instrument-specific credit risk. Changes in fair value due to instrument-specific credit risk are estimated based on changes in the borrower default, prepayment and recovery forecasts in addition to instrument-specific credit spread. Related interest income continues to be measured based on the contractual interest rates and reported as *Interest revenue* in the Consolidated Statement of Income.

Certain Debt Liabilities

The Company has elected the fair value option for certain debt liabilities, because these exposures are considered to be trading-related positions and, therefore, are managed on a fair value basis. These positions are classified as *Long-term debt* on the Company's Consolidated Balance Sheet.

The following table provides information about the carrying value of notes carried at fair value, disaggregated by type of risk:

In billions of dollars	December 31, 2022	December 31, 2021
Interest rate linked	$ 53.4	$ 38.9
Foreign exchange linked	0.1	—
Equity linked	42.5	36.1
Commodity linked	5.0	3.9
Credit linked	5.0	3.7
Total	$ 106.0	$ 82.6

The portion of the changes in fair value attributable to changes in Citigroup's own credit spreads (DVA) is reflected as a component of *AOCI* while all other changes in fair value are reported in *Principal transactions*. Changes in the fair value of these liabilities include accrued interest, which is also included in the change in fair value reported in *Principal transactions*.

Certain Non-Structured Liabilities

The Company has elected the fair value option for certain non-structured liabilities with fixed and floating interest rates. The Company has elected the fair value option where the interest rate risk of such liabilities may be economically hedged with derivative contracts or the proceeds are used to purchase financial assets that will also be accounted for at fair value through earnings. The elections have been made to mitigate accounting mismatches and to achieve operational simplifications. These positions are reported in *Short-term borrowings* and *Long-term debt* on the Company's Consolidated Balance Sheet. The portion of the changes in fair value attributable to changes in Citigroup's own credit spreads (i.e., DVA) is reflected as a component of *AOCI* while all other changes in fair value are reported in *Principal transactions*.

Interest expense on non-structured liabilities is measured based on the contractual interest rates and reported as *Interest expense* in the Consolidated Statement of Income.

The following table provides information about long-term debt carried at fair value:

In millions of dollars	December 31, 2022	December 31, 2021
Carrying amount reported on the Consolidated Balance Sheet	$ 105,995	$ 82,609
Aggregate unpaid principal balance in excess of (less than) fair value	(2,944)	(2,459)

The following table provides information about short-term borrowings carried at fair value:

In millions of dollars	December 31, 2022	December 31, 2021
Carrying amount reported on the Consolidated Balance Sheet	$ 6,222	$ 7,358
Aggregate unpaid principal balance in excess of (less than) fair value	(9)	(644)

27. PLEDGED ASSETS, RESTRICTED CASH, COLLATERAL, GUARANTEES AND COMMITMENTS

Pledged Assets

In connection with Citi's financing and trading activities, Citi has pledged assets to collateralize its obligations under repurchase agreements, secured financing agreements, secured liabilities of consolidated VIEs and other borrowings. The approximate carrying values of the significant components of pledged assets recognized on Citi's Consolidated Balance Sheet included the following:

In millions of dollars	December 31, 2022	December 31, 2021
Investment securities	$ **246,252**	$ 252,192
Loans	**261,450**	232,319
Trading account assets	**135,978**	140,980
Total	$ **643,680**	$ 625,491

Restricted Cash

Citigroup defines restricted cash (as cash subject to withdrawal restrictions) to include cash deposited with central banks that must be maintained to meet minimum regulatory requirements, and cash set aside for the benefit of customers or for other purposes such as compensating balance arrangements or debt retirement. Restricted cash may include minimum reserve requirements at certain central banks and cash segregated to satisfy rules regarding the protection of customer assets as required by Citigroup broker-dealers' primary regulators, including the SEC, the Commodity Futures Trading Commission and the United Kingdom's Prudential Regulation Authority.

Restricted cash is included on the Consolidated Balance Sheet within the following balance sheet lines:

In millions of dollars	December 31, 2022	December 31, 2021
Cash and due from banks	$ **4,820**	$ 2,786
Deposits with banks, net of allowance	**12,156**	10,636
Total	$ **16,976**	$ 13,422

In addition to the restricted cash amounts shown above, approximately $1.8 billion held at the Russia National Settlements Depository is subject to restrictions imposed by the Russian government. This restricted amount is reported within *Other assets* on the Consolidated Balance Sheet.

Collateral

At December 31, 2022 and 2021, the approximate fair value of securities collateral received by Citi that may be resold or repledged, excluding the impact of allowable netting, was $725.5 billion and $650.8 billion, respectively. This collateral was received in connection with resale agreements, securities borrowings and loans, securities for securities lending transactions, derivative transactions and margined broker loans.

At December 31, 2022 and 2021, a substantial portion of the collateral received by Citi had been sold or repledged in connection with repurchase agreements, securities sold, not yet purchased, securities lendings, pledges to clearing organizations, segregation requirements under securities laws and regulations, derivative transactions and bank loans.

In addition, at December 31, 2022 and 2021, Citi had pledged $502.0 billion and $481.0 billion, respectively, of collateral that may not be sold or repledged by the secured parties.

Guarantees

Citi provides a variety of guarantees and indemnifications to its customers to enhance their credit standing and enable them to complete a wide range of business transactions. For certain contracts meeting the definition of a guarantee, the guarantor must recognize, at inception, a liability for the fair value of the obligation undertaken in issuing the guarantee.

In addition, the guarantor must disclose the maximum potential amount of future payments that the guarantor could be required to make under the guarantee, if there were a total default by the guaranteed parties. The determination of the maximum potential future payments is based on the notional amount of the guarantees without consideration of possible recoveries under recourse provisions or from collateral held or pledged. As such, Citi believes such amounts bear no relationship to the anticipated losses, if any, on these guarantees.

The following tables present information about Citi's guarantees:

	Maximum potential amount of future payments			
In billions of dollars at December 31, 2022	Expire within 1 year	Expire after 1 year	Total amount outstanding	Carrying value *(in millions of dollars)*
Financial standby letters of credit	$ 31.3	$ 58.3	$ 89.6	$ 905
Performance guarantees	6.1	5.6	11.7	65
Derivative instruments considered to be guarantees	18.5	30.0	48.5	353
Loans sold with recourse	—	1.7	1.7	13
Securities lending indemnifications[1]	95.9	—	95.9	—
Credit card merchant processing[2]	129.6	—	129.6	1
Credit card arrangements with partners	—	0.6	0.6	7
Other	0.1	8.4	8.5	32
Total	$ 281.5	$ 104.6	$ 386.1	$ 1,376

	Maximum potential amount of future payments			
In billions of dollars at December 31, 2021	Expire within 1 year	Expire after 1 year	Total amount outstanding	Carrying value *(in millions of dollars)*
Financial standby letters of credit	$ 34.3	$ 58.4	$ 92.7	$ 791
Performance guarantees	6.6	6.4	13.0	47
Derivative instruments considered to be guarantees	14.6	48.9	63.5	514
Loans sold with recourse	—	1.7	1.7	15
Securities lending indemnifications[1]	121.9	—	121.9	—
Credit card merchant processing[2]	119.4	—	119.4	1
Credit card arrangements with partners	—	0.8	0.8	7
Other	2.0	12.0	14.0	34
Total	$ 298.8	$ 128.2	$ 427.0	$ 1,409

(1) The carrying values of securities lending indemnifications were not material for either period presented, as the probability of potential liabilities arising from these guarantees is minimal.

(2) At December 31, 2022 and 2021, this maximum potential exposure was estimated to be approximately $130 billion and $119 billion, respectively. However, Citi believes that the maximum exposure is not representative of the actual potential loss exposure based on its historical experience. This contingent liability is unlikely to arise, as most products and services are delivered when purchased and amounts are refunded when items are returned to merchants.

Financial Standby Letters of Credit
Citi issues standby letters of credit, which substitute its own credit for that of the borrower. If a letter of credit is drawn down, the borrower is obligated to repay Citi. Standby letters of credit protect a third party from defaults on contractual obligations. Financial standby letters of credit include (i) guarantees of payment of insurance premiums and reinsurance risks that support industrial revenue bond underwriting, (ii) settlement of payment obligations to clearing houses, including futures and over-the-counter derivatives clearing (see further discussion below), (iii) support options and purchases of securities in lieu of escrow deposit accounts and (iv) letters of credit that backstop loans, credit facilities, promissory notes and trade acceptances.

Performance Guarantees
Performance guarantees and letters of credit are issued to guarantee a customer's tender bid on a construction or systems-installation project or to guarantee completion of such projects in accordance with contract terms. They are also issued to support a customer's obligation to supply specified products, commodities or maintenance or warranty services to a third party.

Derivative Instruments Considered to Be Guarantees
Derivatives are financial instruments whose cash flows are based on a notional amount and an underlying instrument, reference credit or index, where there is little or no initial investment and whose terms require or permit net settlement. See Note 23 for a discussion of Citi's derivatives activities.

Derivative instruments considered to be guarantees include only those instruments that require Citi to make payments to the counterparty based on changes in an underlying instrument that is related to an asset, a liability or an equity security held by the guaranteed party. More specifically, derivative instruments considered to be guarantees include certain over-the-counter written put options where the counterparty is not a bank, hedge fund or broker-dealer (such counterparties are considered to be dealers in these markets and may, therefore, not hold the underlying instruments). Credit derivatives sold by Citi are excluded from the tables above as they are disclosed separately in Note 23. In instances where Citi's maximum potential future payment is unlimited, the notional amount of the contract is disclosed.

Loans Sold with Recourse
Loans sold with recourse represent Citi's obligations to reimburse the buyers for loan losses under certain circumstances. Recourse refers to the clause in a sales agreement under which a seller/lender will fully reimburse the buyer/investor for any losses resulting from the purchased loans. This may be accomplished by the sellers taking back any loans that become delinquent.

In addition to the amounts shown in the tables above, Citi has recorded a repurchase reserve for its potential repurchases or make-whole liability regarding residential mortgage representation and warranty claims related to its whole loan sales to U.S. government-sponsored agencies and, to a lesser extent, private investors. The repurchase reserve was approximately $10 million and $19 million at December 31, 2022 and 2021, respectively, and these amounts are included in *Other liabilities* on the Consolidated Balance Sheet.

Securities Lending Indemnifications
Owners of securities frequently lend those securities for a fee to other parties who may sell them short or deliver them to another party to satisfy some other obligation. Banks may administer such securities lending programs for their clients. Securities lending indemnifications are issued by the bank to guarantee that a securities lending customer will be made whole in the event that the security borrower does not return the security subject to the lending agreement and collateral held is insufficient to cover the market value of the security.

Credit Card Merchant Processing
Credit card merchant processing guarantees represent the Company's indirect obligations in connection with (i) providing transaction processing services to various merchants with respect to its private label cards and (ii) potential liability for bank card transaction processing services. The nature of the liability in either case arises as a result of a billing dispute between a merchant and a cardholder that is ultimately resolved in the cardholder's favor. The merchant is liable to refund the amount to the cardholder. In general, if the credit card processing company is unable to collect this amount from the merchant, the credit card processing company bears the loss for the amount of the credit or refund paid to the cardholder.

With regard to (i) above, Citi has the primary contingent liability with respect to its portfolio of private label merchants. The risk of loss is mitigated as the cash flows between Citi and the merchant are settled on a net basis, and Citi has the right to offset any payments with cash flows otherwise due to the merchant. To further mitigate this risk, Citi may delay settlement, require a merchant to make an escrow deposit, include event triggers to provide Citi with more financial and operational control in the event of the financial deterioration of the merchant or require various credit enhancements (including letters of credit and bank guarantees). In the unlikely event that a private label merchant is unable to deliver products, services or a refund to its private label cardholders, Citi is contingently liable to credit or refund cardholders.

With regard to (ii) above, Citi has a potential liability for bank card transactions where Citi provides the transaction processing services as well as those where a third party provides the services and Citi acts as a secondary guarantor, should that processor fail to perform.

Citi's maximum potential contingent liability related to both bank card and private label merchant processing services is estimated to be the total volume of credit card transactions that meet the requirements to be valid charge-back transactions at any given time. At December 31, 2022 and 2021, this maximum potential exposure was estimated to be $129.6 billion and $119.4 billion, respectively.

However, Citi believes that the maximum exposure is not representative of the actual potential loss exposure based on its historical experience. This contingent liability is unlikely to arise, as most products and services are delivered when purchased and amounts are refunded when items are returned to merchants. Citi assesses the probability and amount of its

contingent liability related to merchant processing based on the financial strength of the primary guarantor, the extent and nature of unresolved charge-backs and its historical loss experience. At December 31, 2022 and 2021, the losses incurred and the carrying amounts of Citi's contingent obligations related to merchant processing activities were immaterial.

Credit Card Arrangements with Partners

Citi, in one of its credit card partner arrangements, provides guarantees to the partner regarding the volume of certain customer originations during the term of the agreement. To the extent that such origination targets are not met, the guarantees serve to compensate the partner for certain payments that otherwise would have been generated in connection with such originations.

Other Guarantees and Indemnifications

Credit Card Protection Programs

Citi, through its credit card businesses, provides various cardholder protection programs on several of its card products, including programs that provide insurance coverage for rental cars, coverage for certain losses associated with purchased products, price protection for certain purchases and protection for lost luggage. These guarantees are not included in the table, since the total outstanding amount of the guarantees and Citi's maximum exposure to loss cannot be quantified. The protection is limited to certain types of purchases and losses, and it is not possible to quantify the purchases that would qualify for these benefits at any given time. Citi assesses the probability and amount of its potential liability related to these programs based on the extent and nature of its historical loss experience. At December 31, 2022 and 2021, the actual and estimated losses incurred and the carrying value of Citi's obligations related to these programs were immaterial.

Other Representation and Warranty Indemnifications

In the normal course of business, Citi provides standard representations and warranties to counterparties in contracts in connection with numerous transactions and also provides indemnifications, including indemnifications that protect the counterparties to the contracts in the event that additional taxes are owed, due either to a change in the tax law or an adverse interpretation of the tax law. Counterparties to these transactions provide Citi with comparable indemnifications. While such representations, warranties and indemnifications are essential components of many contractual relationships, they do not represent the underlying business purpose for the transactions. The indemnification clauses are often standard contractual terms related to Citi's own performance under the terms of a contract and are entered into in the normal course of business based on an assessment that the risk of loss is remote. Often these clauses are intended to ensure that terms of a contract are met at inception. No compensation is received for these standard representations and warranties, and it is not possible to determine their fair value because they rarely, if ever, result in a payment. In many cases, there are no stated or notional amounts included in the indemnification clauses, and the contingencies potentially triggering the obligation to indemnify have not occurred and are not expected to occur. As a result, these indemnifications are not included in the tables above.

Value-Transfer Networks (Including Exchanges and Clearing Houses) (VTNs)

Citi is a member of, or shareholder in, hundreds of value-transfer networks (VTNs) (payment, clearing and settlement systems as well as exchanges) around the world. As a condition of membership, many of these VTNs require that members stand ready to pay a pro rata share of the losses incurred by the organization due to another member's default on its obligations. Citi's potential obligations may be limited to its membership interests in the VTNs, contributions to the VTN's funds, or, in certain narrow cases, to the full pro rata share. The maximum exposure is difficult to estimate as this would require an assessment of claims that have not yet occurred; however, Citi believes the risk of loss is remote given historical experience with the VTNs. Accordingly, Citi's participation in VTNs is not reported in the guarantees tables above, and there are no amounts reflected on the Consolidated Balance Sheet as of December 31, 2022 or 2021 for potential obligations that could arise from Citi's involvement with VTN associations.

Long-Term Care Insurance Indemnification

In 2000, Travelers Life & Annuity (Travelers), then a subsidiary of Citi, entered into a reinsurance agreement to transfer the risks and rewards of its long-term care (LTC) business to GE Life (now Genworth Financial Inc., or Genworth), then a subsidiary of the General Electric Company (GE). As part of this transaction, the reinsurance obligations were provided by two regulated insurance subsidiaries of GE Life, which funded two collateral trusts with securities. Presently, as discussed below, the trusts are referred to as the Genworth Trusts.

As part of GE's spin-off of Genworth in 2004, GE retained the risks and rewards associated with the 2000 Travelers reinsurance agreement by providing a reinsurance contract to Genworth through GE's Union Fidelity Life Insurance Company (UFLIC) subsidiary that covers the Travelers LTC policies. In addition, GE provided a capital maintenance agreement in favor of UFLIC that is designed to assure that UFLIC will have the funds to pay its reinsurance obligations. As a result of these reinsurance agreements and the spin-off of Genworth, Genworth has reinsurance protection from UFLIC (supported by GE) and has reinsurance obligations in connection with the Travelers LTC policies. As noted below, the Genworth reinsurance obligations now benefit Brighthouse Financial, Inc. (Brighthouse). While neither Brighthouse nor Citi are direct beneficiaries of the capital maintenance agreement between GE and UFLIC, Brighthouse and Citi benefit indirectly from the existence of the capital maintenance agreement, which helps assure that UFLIC will continue to have funds necessary to pay its reinsurance obligations to Genworth.

In connection with Citi's 2005 sale of Travelers to MetLife Inc. (MetLife), Citi provided an indemnification to MetLife for losses (including policyholder claims) relating to the LTC business for the entire term of the Travelers LTC

policies, which, as noted above, are reinsured by subsidiaries of Genworth. In 2017, MetLife spun off its retail insurance business to Brighthouse. As a result, the Travelers LTC policies now reside with Brighthouse. The original reinsurance agreement between Travelers (now Brighthouse) and Genworth remains in place and Brighthouse is the sole beneficiary of the Genworth Trusts. The Genworth Trusts are designed to provide collateral to Brighthouse in an amount equal to the statutory liabilities of Brighthouse in respect of the Travelers LTC policies. The assets in the Genworth Trusts are evaluated and adjusted periodically to ensure that the fair value of the assets continues to provide collateral in an amount equal to these estimated statutory liabilities, as the liabilities change over time.

If both (i) Genworth fails to perform under the original Travelers/GE Life reinsurance agreement for any reason, including its insolvency or the failure of UFLIC to perform under its reinsurance contract or GE to perform under the capital maintenance agreement, and (ii) the assets of the two Genworth Trusts are insufficient or unavailable, then Citi, through its LTC reinsurance indemnification, must reimburse Brighthouse for any losses incurred in connection with the LTC policies. Since both events would have to occur before Citi would become responsible for any payment to Brighthouse pursuant to its indemnification obligation, and the likelihood of such events occurring is currently not probable, there is no liability reflected on the Consolidated Balance Sheet as of December 31, 2022 and 2021 related to this indemnification. However, if both events become reasonably possible (meaning more than remote but less than probable), Citi will be required to estimate and disclose a reasonably possible loss or range of loss to the extent that such an estimate could be made. In addition, if both events become probable, Citi will be required to accrue for such liability in accordance with applicable accounting principles.

Futures and Over-the-Counter Derivatives Clearing

Citi provides clearing services on central clearing parties (CCP) for clients that need to clear exchange-traded and over-the-counter (OTC) derivatives contracts with CCPs. Based on all relevant facts and circumstances, Citi has concluded that it acts as an agent for accounting purposes in its role as clearing member for these client transactions. As such, Citi does not reflect the underlying exchange-traded or OTC derivatives contracts in its Consolidated Financial Statements. See Note 23 for a discussion of Citi's derivatives activities that are reflected in its Consolidated Financial Statements.

As a clearing member, Citi collects and remits cash and securities collateral (margin) between its clients and the respective CCP. In certain circumstances, Citi collects a higher amount of cash (or securities) from its clients than it needs to remit to the CCPs. This excess cash is then held at depository institutions such as banks or carry brokers.

There are two types of margin: initial and variation. Where Citi obtains benefits from or controls cash initial margin (e.g., retains an interest spread), cash initial margin collected from clients and remitted to the CCP or depository institutions is reflected within *Brokerage payables* (payables to customers) and *Brokerage receivables* (receivables from brokers, dealers and clearing organizations) or *Cash and due from banks*, respectively.

However, for exchange-traded and OTC-cleared derivatives contracts where Citi does not obtain benefits from or control the client cash balances, the client cash initial margin collected from clients and remitted to the CCP or depository institutions is not reflected on Citi's Consolidated Balance Sheet. These conditions are met when Citi has contractually agreed with the client that (i) Citi will pass through to the client all interest paid by the CCP or depository institutions on the cash initial margin, (ii) Citi will not utilize its right as a clearing member to transform cash margin into other assets, (iii) Citi does not guarantee and is not liable to the client for the performance of the CCP or the depository institution and (iv) the client cash balances are legally isolated from Citi's bankruptcy estate. The total amount of cash initial margin collected and remitted in this manner was approximately $18.0 billion and $18.7 billion as of December 31, 2022 and 2021, respectively.

Variation margin due from clients to the respective CCP, or from the CCP to clients, reflects changes in the value of the client's derivative contracts for each trading day. As a clearing member, Citi is exposed to the risk of non-performance by clients (e.g., failure of a client to post variation margin to the CCP for negative changes in the value of the client's derivative contracts). In the event of non-performance by a client, Citi would move to close out the client's positions. The CCP would typically utilize initial margin posted by the client and held by the CCP, with any remaining shortfalls required to be paid by Citi as clearing member. Citi generally holds incremental cash or securities margin posted by the client, which would typically be expected to be sufficient to mitigate Citi's credit risk in the event that the client fails to perform.

As required by ASC 860-30-25-5, securities collateral posted by clients is not recognized on Citi's Consolidated Balance Sheet.

Carrying Value—Guarantees and Indemnifications

At December 31, 2022 and 2021, the total carrying amounts of the liabilities related to the guarantees and indemnifications included in the tables above amounted to approximately $1.4 billion and $1.4 billion, respectively. The carrying value of financial and performance guarantees is included in *Other liabilities*. For loans sold with recourse, the carrying value of the liability is included in *Other liabilities*.

Collateral

Cash collateral available to Citi to reimburse losses realized under these guarantees and indemnifications amounted to $51.8 billion and $56.5 billion at December 31, 2022 and 2021, respectively. Securities and other marketable assets held as collateral amounted to $63.7 billion and $84.2 billion at December 31, 2022 and 2021, respectively. The majority of collateral is held to reimburse losses realized under securities lending indemnifications. In addition, letters of credit in favor of Citi held as collateral amounted to $3.7 billion and $4.1 billion at December 31, 2022 and 2021, respectively. Other property may also be available to Citi to cover losses under certain guarantees and indemnifications; however, the value of such property has not been determined.

Performance Risk

Citi evaluates the performance risk of its guarantees based on the assigned referenced counterparty internal or external ratings. Where external ratings are used, investment-grade ratings are considered to be Baa/BBB and above, while anything below is considered non-investment grade. Citi's internal ratings are in line with the related external rating system. On certain underlying referenced assets or entities, ratings are not available. Such referenced assets are included in the "not rated" category. The maximum potential amount of the future payments related to the outstanding guarantees is determined to be the notional amount of these contracts, which is the par amount of the assets guaranteed.

Presented in the tables below are the maximum potential amounts of future payments that are classified based on internal and external credit ratings. The determination of the maximum potential future payments is based on the notional amount of the guarantees without consideration of possible recoveries under recourse provisions or from collateral held or pledged. As such, Citi believes such amounts bear no relationship to the anticipated losses, if any, on these guarantees.

	Maximum potential amount of future payments			
In billions of dollars at December 31, 2022	**Investment grade**	**Non-investment grade**	**Not rated**	**Total**
Financial standby letters of credit	**$ 77.9**	**$ 10.4**	**$ 1.3**	**$ 89.6**
Performance guarantees	**9.3**	**2.4**	**—**	**11.7**
Derivative instruments deemed to be guarantees	**—**	**—**	**48.5**	**48.5**
Loans sold with recourse	**—**	**—**	**1.7**	**1.7**
Securities lending indemnifications	**—**	**—**	**95.9**	**95.9**
Credit card merchant processing	**—**	**—**	**129.6**	**129.6**
Credit card arrangements with partners	**—**	**—**	**0.6**	**0.6**
Other	**—**	**8.5**	**—**	**8.5**
Total	**$ 87.2**	**$ 21.3**	**$ 277.6**	**$ 386.1**

	Maximum potential amount of future payments			
In billions of dollars at December 31, 2021	Investment grade	Non-investment grade	Not rated	Total
Financial standby letters of credit	$ 81.4	$ 11.3	$ —	$ 92.7
Performance guarantees	10.5	2.5	—	13.0
Derivative instruments deemed to be guarantees	—	—	63.5	63.5
Loans sold with recourse	—	—	1.7	1.7
Securities lending indemnifications	—	—	121.9	121.9
Credit card merchant processing	—	—	119.4	119.4
Credit card arrangements with partners	—	—	0.8	0.8
Other	—	12.0	2.0	14.0
Total	$ 91.9	$ 25.8	$ 309.3	$ 427.0

Credit Commitments and Lines of Credit

The table below summarizes Citigroup's credit commitments:

In millions of dollars	U.S.	Outside of U.S.[1]	December 31, 2022	December 31, 2021
Commercial and similar letters of credit	$ 650	$ 4,666	$ 5,316	$ 5,910
One- to four-family residential mortgages	906	1,488	2,394	4,351
Revolving open-end loans secured by one- to four-family residential properties	5,719	661	6,380	7,913
Commercial real estate, construction and land development	13,275	1,895	15,170	17,843
Credit card lines	603,975	79,257	683,232	700,559
Commercial and other consumer loan commitments	191,318	106,081	297,399	320,556
Other commitments and contingencies	5,469	204	5,673	5,649
Total	$ 821,312	$ 194,252	$ 1,015,564	$ 1,062,781

(1) Consumer commitments related to the business HFS countries under sales agreements are reflected in their original categories until the respective sales are completed.

The majority of unused commitments are contingent upon customers maintaining specific credit standards. Commercial commitments generally have floating interest rates and fixed expiration dates and may require payment of fees. Such fees (net of certain direct costs) are deferred and, upon exercise of the commitment, amortized over the life of the loan or, if exercise is deemed remote, amortized over the commitment period.

Commercial and Similar Letters of Credit

A commercial letter of credit is an instrument by which Citigroup substitutes its credit for that of a customer to enable the customer to finance the purchase of goods or to incur other commitments. Citigroup issues a letter on behalf of its client to a supplier and agrees to pay the supplier upon presentation of documentary evidence that the supplier has performed in accordance with the terms of the letter of credit. When a letter of credit is drawn, the customer is then required to reimburse Citigroup.

One- to Four-Family Residential Mortgages

A one- to four-family residential mortgage commitment is a written confirmation from Citigroup to a seller of a property that the bank will advance the specified sums enabling the buyer to complete the purchase.

Revolving Open-End Loans Secured by One- to Four-Family Residential Properties

Revolving open-end loans secured by one- to four-family residential properties are essentially home equity lines of credit. A home equity line of credit is a loan secured by a primary residence or second home to the extent of the excess of fair market value over the debt outstanding for the first mortgage.

Commercial Real Estate, Construction and Land Development

Commercial real estate, construction and land development include unused portions of commitments to extend credit for the purpose of financing commercial and multifamily residential properties as well as land development projects.

Both secured-by-real-estate and unsecured commitments are included in this line, as well as undistributed loan proceeds, where there is an obligation to advance for construction progress payments. However, this line only includes those extensions of credit that, once funded, will be classified as *Total loans, net* on the Consolidated Balance Sheet.

Credit Card Lines

Citigroup provides credit to customers by issuing credit cards. The credit card lines are cancelable by providing notice to the cardholder or without such notice as permitted by local law.

Commercial and Other Consumer Loan Commitments

Commercial and other consumer loan commitments include overdraft and liquidity facilities as well as commercial commitments to make or purchase loans, purchase third-party receivables, provide note issuance or revolving underwriting facilities and invest in the form of equity.

Other Commitments and Contingencies

Other commitments and contingencies include all other transactions related to commitments and contingencies not reported on the lines above.

Unsettled Reverse Repurchase and Securities Borrowing Agreements and Unsettled Repurchase and Securities Lending Agreements

In addition, in the normal course of business, Citigroup enters into reverse repurchase and securities borrowing agreements, as well as repurchase and securities lending agreements, which settle at a future date. At December 31, 2022 and 2021, Citigroup had approximately $111.6 billion and $126.6 billion of unsettled reverse repurchase and securities borrowing agreements, and approximately $37.3 billion and $41.1 billion of unsettled repurchase and securities lending agreements, respectively. See Note 11 for a further discussion of securities purchased under agreements to resell and securities borrowed, and securities sold under agreements to repurchase and securities loaned, including the Company's policy for offsetting repurchase and reverse repurchase agreements.

28. LEASES

The Company's operating leases, where Citi is a lessee, include real estate such as office space and branches and various types of equipment. These leases may contain renewal and extension options and early termination features; however, these options do not impact the lease term unless the Company is reasonably certain that it will exercise options. These leases have a weighted-average remaining lease term of approximately six years as of December 31, 2022 and 2021.

For additional information regarding Citi's leases, see Note 1.

The following table presents information on the right-of-use (ROU) asset and lease liabilities included in *Premises and equipment* and *Other liabilities*, respectively:

In millions of dollars	**December 31, 2022**	December 31, 2021
ROU asset	$ **2,892**	$ 2,914
Lease liability	**3,076**	3,116

The Company recognizes fixed lease costs on a straight-line basis throughout the lease term in the Consolidated Statement of Income. In addition, variable lease costs are recognized in the period in which the obligation for those payments is incurred.

The following table presents the total operating lease expense (principally for offices, branches and equipment) included in the Consolidated Statement of Income:

In millions of dollars	**Dec. 31, 2022**	Dec. 31, 2021	Dec. 31, 2020
Operating lease expense[1]	$ **1,048**	$ 1,061	$ 1,054

(1) Balances presented net of $3 million, $12 million and $27 million of sublease income for the years ended December 31, 2022, 2021 and 2020, respectively.

The table below provides the Cash Flow Statement Supplemental Information:

In millions of dollars	**December 31, 2022**	December 31, 2021
Cash paid for amounts included in the measurement of lease liabilities	$ **725**	$ 806
ROU assets obtained in exchange for new operating lease liabilities[1][2]	**775**	845

(1) Represents non-cash activity and, accordingly, is not reflected in the Consolidated Statement of Cash Flows.

(2) Excludes the decrease in the ROU assets related to the purchase of a previously leased property.

Citi's future lease payments are as follows:

In millions of dollars	
2023	$ 704
2024	635
2025	541
2026	437
2027	319
Thereafter	769
Total future lease payments	$ 3,405
Less imputed interest (based on weighted-average discount rate of 3.1%)	$ (329)
Lease liability	$ 3,076

29. CONTINGENCIES

Accounting and Disclosure Framework

ASC 450 governs the disclosure and recognition of loss contingencies, including potential losses from litigation, regulatory, tax and other matters. ASC 450 defines a "loss contingency" as "an existing condition, situation, or set of circumstances involving uncertainty as to possible loss to an entity that will ultimately be resolved when one or more future events occur or fail to occur." It imposes different requirements for the recognition and disclosure of loss contingencies based on the likelihood of occurrence of the contingent future event or events. It distinguishes among degrees of likelihood using the following three terms: "probable," meaning that "the future event or events are likely to occur"; "remote," meaning that "the chance of the future event or events occurring is slight"; and "reasonably possible," meaning that "the chance of the future event or events occurring is more than remote but less than likely." These three terms are used below as defined in ASC 450.

Accruals. ASC 450 requires accrual for a loss contingency when it is "probable that one or more future events will occur confirming the fact of loss" *and* "the amount of the loss can be reasonably estimated." In accordance with ASC 450, Citigroup establishes accruals for contingencies, including any litigation, regulatory or tax matters disclosed herein, when Citigroup believes it is probable that a loss has been incurred and the amount of the loss can be reasonably estimated. When the reasonable estimate of the loss is within a range of amounts, the minimum amount of the range is accrued, unless some higher amount within the range is a better estimate than any other amount within the range. Once established, accruals are adjusted from time to time, as appropriate, in light of additional information. The amount of loss ultimately incurred in relation to those matters may be substantially higher or lower than the amounts accrued for those matters.

Disclosure. ASC 450 requires disclosure of a loss contingency if "there is at least a reasonable possibility that a loss or an additional loss may have been incurred" *and* there is no accrual for the loss because the conditions described above are not met or an exposure to loss exists in excess of the amount accrued. In accordance with ASC 450, if Citigroup has not accrued for a matter because Citigroup believes that a loss is reasonably possible but not probable, or that a loss is probable but not reasonably estimable, and the reasonably possible loss is material, it discloses the loss contingency. In addition, Citigroup discloses matters for which it has accrued if it believes a reasonably possible exposure to material loss exists in excess of the amount accrued. In accordance with ASC 450, Citigroup's disclosure includes an estimate of the reasonably possible loss or range of loss for those matters as to which an estimate can be made. ASC 450 does not require disclosure of an estimate of the reasonably possible loss or range of loss where an estimate cannot be made. Neither accrual nor disclosure is required for losses that are deemed remote.

Litigation, Regulatory and Other Contingencies

Overview. In addition to the matters described below, in the ordinary course of business, Citigroup, its affiliates and subsidiaries, and current and former officers, directors and employees (for purposes of this section, sometimes collectively referred to as Citigroup and Related Parties) routinely are named as defendants in, or as parties to, various legal actions and proceedings. Certain of these actions and proceedings assert claims or seek relief in connection with alleged violations of consumer protection, fair lending, securities, banking, antifraud, antitrust, anti-money laundering, employment and other statutory and common laws. Certain of these actual or threatened legal actions and proceedings include claims for substantial or indeterminate compensatory or punitive damages, or for injunctive relief, and in some instances seek recovery on a class-wide basis.

In the ordinary course of business, Citigroup and Related Parties also are subject to governmental and regulatory examinations, information-gathering requests, investigations and proceedings (both formal and informal), certain of which may result in adverse judgments, settlements, fines, penalties, restitution, disgorgement, injunctions or other relief. In addition, certain affiliates and subsidiaries of Citigroup are banks, registered broker-dealers, futures commission merchants, investment advisors or other regulated entities and, in those capacities, are subject to regulation by various U.S., state and foreign securities, banking, commodity futures, consumer protection and other regulators. In connection with formal and informal inquiries by these regulators, Citigroup and such affiliates and subsidiaries receive numerous requests, subpoenas and orders seeking documents, testimony and other information in connection with various aspects of their regulated activities. From time to time Citigroup and Related Parties also receive grand jury subpoenas and other requests for information or assistance, formal or informal, from federal or state law enforcement agencies including, among others, various United States Attorneys' Offices, the Money Laundering and Asset Recovery Section and other divisions of the Department of Justice, the Financial Crimes Enforcement Network of the United States Department of the Treasury, and the Federal Bureau of Investigation relating to Citigroup and its customers.

Because of the global scope of Citigroup's operations and its presence in countries around the world, Citigroup and Related Parties are subject to litigation and governmental and regulatory examinations, information-gathering requests, investigations and proceedings (both formal and informal) in multiple jurisdictions with legal, regulatory and tax regimes that may differ substantially, and present substantially different risks, from those Citigroup and Related Parties are subject to in the United States. In some instances, Citigroup and Related Parties may be involved in proceedings involving the same subject matter in multiple jurisdictions, which may result in overlapping, cumulative or inconsistent outcomes.

Citigroup seeks to resolve all litigation, regulatory, tax and other matters in the manner management believes is in the best interests of Citigroup and its shareholders, and contests liability, allegations of wrongdoing and, where applicable, the amount of damages or scope of any penalties or other relief sought as appropriate in each pending matter.

Inherent Uncertainty of the Matters Disclosed. Certain of the matters disclosed below involve claims for substantial or indeterminate damages. The claims asserted in these matters

typically are broad, often spanning a multiyear period and sometimes a wide range of business activities, and the plaintiffs' or claimants' alleged damages frequently are not quantified or factually supported in the complaint or statement of claim. Other matters relate to regulatory investigations or proceedings, as to which there may be no objective basis for quantifying the range of potential fine, penalty or other remedy. As a result, Citigroup is often unable to estimate the loss in such matters, even if it believes that a loss is probable or reasonably possible, until developments in the case, proceeding or investigation have yielded additional information sufficient to support a quantitative assessment of the range of reasonably possible loss. Such developments may include, among other things, discovery from adverse parties or third parties, rulings by the court on key issues, analysis by retained experts and engagement in settlement negotiations.

Depending on a range of factors, such as the complexity of the facts, the novelty of the legal theories, the pace of discovery, the court's scheduling order, the timing of court decisions and the adverse party's, regulator's or other authority's willingness to negotiate in good faith toward a resolution, it may be months or years after the filing of a case or commencement of a proceeding or an investigation before an estimate of the range of reasonably possible loss can be made.

Matters as to Which an Estimate Can Be Made. For some of the matters disclosed below, Citigroup is currently able to estimate a reasonably possible loss or range of loss in excess of amounts accrued (if any). For some of the matters included within this estimation, an accrual has been made because a loss is believed to be both probable and reasonably estimable, but a reasonably possible exposure to loss exists in excess of the amount accrued. In these cases, the estimate reflects the reasonably possible range of loss in excess of the accrued amount. For other matters included within this estimation, no accrual has been made because a loss, although estimable, is believed to be reasonably possible, but not probable; in these cases, the estimate reflects the reasonably possible loss or range of loss. As of December 31, 2022, Citigroup estimates that the reasonably possible unaccrued loss for these matters ranges up to approximately $1.2 billion in the aggregate.

These estimates are based on currently available information. As available information changes, the matters for which Citigroup is able to estimate will change, and the estimates themselves will change. In addition, while many estimates presented in financial statements and other financial disclosures involve significant judgment and may be subject to significant uncertainty, estimates of the range of reasonably possible loss arising from litigation, regulatory and tax proceedings are subject to particular uncertainties. For example, at the time of making an estimate, (i) Citigroup may have only preliminary, incomplete or inaccurate information about the facts underlying the claim, (ii) its assumptions about the future rulings of the court, other tribunal or authority on significant issues, or the behavior and incentives of adverse parties, regulators or other authorities, may prove to be wrong and (iii) the outcomes it is attempting to predict are often not amenable to the use of statistical or other quantitative analytical tools. In addition, from time to time an outcome may occur that Citigroup had not accounted for in its estimate because it had deemed such an outcome to be remote. For all of these reasons, the amount of loss in excess of amounts accrued in relation to matters for which an estimate has been made could be substantially higher or lower than the range of loss included in the estimate.

Matters as to Which an Estimate Cannot Be Made. For other matters disclosed below, Citigroup is not currently able to estimate the reasonably possible loss or range of loss. Many of these matters remain in very preliminary stages (even in some cases where a substantial period of time has passed since the commencement of the matter), with few or no substantive legal decisions by the court, tribunal or other authority defining the scope of the claims, the class (if any) or the potentially available damages or other exposure, and fact discovery is still in progress or has not yet begun. In many of these matters, Citigroup has not yet answered the complaint or statement of claim or asserted its defenses, nor has it engaged in any negotiations with the adverse party (whether a regulator, taxing authority or a private party). For all these reasons, Citigroup cannot at this time estimate the reasonably possible loss or range of loss, if any, for these matters.

Opinion of Management as to Eventual Outcome. Subject to the foregoing, it is the opinion of Citigroup's management, based on current knowledge and after taking into account its current accruals, that the eventual outcome of all matters described in this Note would not likely have a material adverse effect on the consolidated financial condition of Citigroup.

Nonetheless, given the substantial or indeterminate amounts sought in certain of these matters, and the inherent unpredictability of such matters, an adverse outcome in certain of these matters could, from time to time, have a material adverse effect on Citigroup's consolidated results of operations or cash flows in particular quarterly or annual periods.

Foreign Exchange Matters

Regulatory Actions: Government and regulatory agencies in the U.S. and other jurisdictions are conducting investigations or making inquiries regarding Citigroup's foreign exchange business. Citigroup is cooperating with these and related investigations and inquiries.

Antitrust and Other Litigation: In 2018, a number of institutional investors who opted out of the previously disclosed August 2018 final settlement filed an action against Citigroup, Citibank, Citigroup Global Markets Inc. (CGMI) and other defendants, captioned ALLIANZ GLOBAL INVESTORS, ET AL. v. BANK OF AMERICA CORP., ET AL., in the United States District Court for the Southern District of New York. Plaintiffs allege that defendants manipulated, and colluded to manipulate, the foreign exchange markets. Plaintiffs assert claims under the Sherman Act and unjust enrichment claims, and seek consequential and punitive damages and other forms of relief. In July 2020, plaintiffs filed a third amended complaint. Additional information concerning this action is publicly available in court filings under the docket number 18-CV-10364 (S.D.N.Y.) (Schofield, J.).

In 2018, a group of institutional investors issued a claim against Citigroup, Citibank and other defendants, captioned ALLIANZ GLOBAL INVESTORS GMBH AND OTHERS v. BARCLAYS BANK PLC AND OTHERS, in the High Court

of Justice in London. Claimants allege that defendants manipulated, and colluded to manipulate, the foreign exchange market in violation of EU and U.K. competition laws. In December 2021, the High Court ordered that the case be transferred to the U.K.'s Competition Appeal Tribunal. Additional information concerning this action is publicly available in court filings under the case number CL-2018-000840 in the High Court and under the case number 1430/5/7/22 (T) in the Competition Appeal Tribunal.

In 2015, a putative class of consumers and businesses in the U.S. who directly purchased supracompetitive foreign currency at benchmark exchange rates filed an action against Citigroup and other defendants, captioned NYPL v. JPMORGAN CHASE & CO., ET AL., in the United States District Court for the Northern District of California (later transferred to the United States District Court for the Southern District of New York). Subsequently, plaintiffs filed an amended class action complaint against Citigroup, Citibank and Citicorp as defendants. Plaintiffs allege that they suffered losses as a result of defendants' alleged manipulation of, and collusion with respect to, the foreign exchange market. Plaintiffs assert claims under federal and California antitrust and consumer protection laws, and seek compensatory damages, treble damages and declaratory and injunctive relief. On March 8, 2022, the court denied plaintiffs' motion for class certification. On August 22, 2022, the United States Court of Appeals for the Second Circuit denied plaintiffs' application seeking appellate review of the decision denying class certification. Additional information concerning this action is publicly available in court filings under the docket numbers 15-CV-2290 (N.D. Cal.) (Chhabria, J.), 15-CV-9300 (S.D.N.Y.) (Schofield, J.) and 22-698 (2d Cir.).

In 2019, two applications, captioned MICHAEL O' HIGGINS FX CLASS REPRESENTATIVE LIMITED v. BARCLAYS BANK PLC AND OTHERS and PHILLIP EVANS v. BARCLAYS BANK PLC AND OTHERS, were made to the U.K.'s Competition Appeal Tribunal requesting permission to commence collective proceedings against Citigroup, Citibank and other defendants. The applications seek compensatory damages for losses alleged to have arisen from the actions at issue in the European Commission's foreign exchange spot trading infringement decision (European Commission Decision of May 16, 2019 in Case AT.40135-FOREX (Three Way Banana Split) C(2019) 3631 final). On March 31, 2022, the U.K.'s Competition Appeal Tribunal issued its judgment on certification, and on October 4, 2022, the U.K.'s Competition Appeal Tribunal granted both claimants permission to appeal the certification judgment. Additional information concerning these actions is publicly available in court filings under the case numbers 1329/7/7/19 and 1336/7/7/19.

In 2019, a putative class action was filed against Citibank and other defendants, captioned J WISBEY & ASSOCIATES PTY LTD v. UBS AG & ORS, in the Federal Court of Australia. Plaintiffs allege that defendants manipulated the foreign exchange markets. Plaintiffs assert claims under antitrust laws, and seek compensatory damages and declaratory and injunctive relief. Additional information concerning this action is publicly available in court filings under the docket number VID567/2019.

In 2019, two motions for certification of class actions filed against Citigroup, Citibank and Citicorp and other defendants were consolidated, under the caption GERTLER, ET AL. v. DEUTSCHE BANK AG, in the Tel Aviv Central District Court in Israel. Plaintiffs allege that defendants manipulated the foreign exchange markets. In April 2021, Citibank's motion to dismiss plaintiffs' petition for certification was denied. On April 6, 2022, the Supreme Court of Israel denied Citibank's motion for leave to appeal the Central District Court's denial of its motion to dismiss. Additional information concerning this action is publicly available in court filings under the docket number CA 29013-09-18.

Hong Kong Private Bank Litigation

In 2007, a claim was filed in the High Court of Hong Kong claiming damages of over $51 million against Citibank. The case, captioned PT ASURANSI TUGU PRATAMA INDONESIA TBK v. CITIBANK N.A., was dismissed in 2018 by the Hong Kong Court of First Instance on grounds that the claim was time-barred. On April 12, 2022, the Court of Appeal upheld the dismissal of the claim. The plaintiff appealed, and on February 6, 2023, the Court of Final Appeal rendered a judgment in the plaintiff's favor. Additional information concerning this action is publicly available in court filings under the docket number FACV 11/2022.

Interbank Offered Rates-Related Litigation and Other Matters

In August 2020, individual borrowers and consumers of loans and credit cards filed an action against Citigroup, Citibank, CGMI and other defendants, captioned MCCARTHY, ET AL. v. INTERCONTINENTAL EXCHANGE, INC., ET AL., in the United States District Court for the Northern District of California. Plaintiffs allege that defendants conspired to fix ICE LIBOR, assert claims under the Sherman Act and the Clayton Act, and seek declaratory relief, injunctive relief, and treble damages. On October 4, 2022, plaintiffs filed an amended complaint, and on November 4, 2022, defendants moved to dismiss the amended complaint. Additional information concerning this action is publicly available in court filings under the docket number 20-CV-5832 (N.D. Cal.) (Donato, J.).

Interchange Fee Litigation

Beginning in 2005, several putative class actions were filed against Citigroup, Citibank, and Citicorp, together with Visa, MasterCard, and other banks and their affiliates, in various federal district courts and consolidated with other related individual cases in a multi-district litigation proceeding in the United States District Court for the Eastern District of New York. This proceeding is captioned IN RE PAYMENT CARD INTERCHANGE FEE AND MERCHANT DISCOUNT ANTITRUST LITIGATION.

The plaintiffs, merchants that accept Visa and MasterCard branded payment cards, as well as various membership associations that claim to represent certain groups of merchants, allege, among other things, that defendants have engaged in conspiracies to set the price of interchange and merchant discount fees on credit and debit card transactions

and to restrain trade unreasonably through various Visa and MasterCard rules governing merchant conduct, all in violation of Section 1 of the Sherman Act and certain California statutes. Plaintiffs further alleged violations of Section 2 of the Sherman Act. Supplemental complaints also were filed against defendants in the putative class actions alleging that Visa's and MasterCard's respective initial public offerings were anticompetitive and violated Section 7 of the Clayton Act, and that MasterCard's initial public offering constituted a fraudulent conveyance.

In 2014, the district court entered a final judgment approving the terms of a class settlement. Various objectors appealed from the final class settlement approval order to the United States Court of Appeals for the Second Circuit.

In 2016, the Court of Appeals reversed the district court's approval of the class settlement and remanded for further proceedings. The district court thereafter appointed separate interim counsel for a putative class seeking damages and a putative class seeking injunctive relief. Amended or new complaints on behalf of the putative classes and various individual merchants were subsequently filed, including a further amended complaint on behalf of a putative damages class and a new complaint on behalf of a putative injunctive class, both of which named Citigroup and Related Parties. In addition, numerous merchants have filed amended or new complaints against Visa, MasterCard, and in some instances one or more issuing banks, including Citigroup and affiliates.

In 2019, the district court granted the damages class plaintiffs' motion for final approval of a new settlement with the defendants. The settlement involves the damages class only and does not settle the claims of the injunctive relief class or any actions brought on a non-class basis by individual merchants. The settlement provides for a cash payment to the damages class of $6.24 billion, later reduced by $700 million based on the transaction volume of class members that opted out from the settlement. Several merchants and merchant groups have appealed the final approval order. On September 27, 2021, the court granted the injunctive relief class plaintiffs' motion to certify a non-opt-out class. On October 7 and 9, 2022, the court issued rulings on several pretrial motions. Additional information concerning these consolidated actions is publicly available in court filings under the docket number MDL 05-1720 (E.D.N.Y.) (Brodie, J.).

Interest Rate and Credit Default Swap Matters

Regulatory Actions: The Commodity Futures Trading Commission (CFTC) is conducting an investigation into alleged anticompetitive conduct in the trading and clearing of interest rate swaps (IRS) by investment banks. Citigroup is cooperating with the investigation.

Antitrust and Other Litigation: Beginning in 2015, Citigroup, Citibank, CGMI, CGML and numerous other parties were named as defendants in a number of industry-wide putative class actions related to IRS trading. These actions have been consolidated in the United States District Court for the Southern District of New York under the caption IN RE INTEREST RATE SWAPS ANTITRUST LITIGATION. The actions allege that defendants colluded to prevent the development of exchange-like trading for IRS and assert federal and state antitrust claims and claims for unjust enrichment. Also consolidated under the same caption are individual actions filed by swap execution facilities, asserting federal and state antitrust claims, as well as claims for unjust enrichment and tortious interference with business relations. Plaintiffs in these actions seek treble damages, fees, costs and injunctive relief. Lead plaintiffs in the class action moved for class certification in 2019 and subsequently filed an amended complaint. Additional information concerning these actions is publicly available in court filings under the docket numbers 18-CV-5361 (S.D.N.Y.) (Oetken, J.) and 16-MD-2704 (S.D.N.Y.) (Oetken, J.).

In 2017, Citigroup, Citibank, CGMI, CGML and numerous other parties were named as defendants in an action filed in the United States District Court for the Southern District of New York under the caption TERA GROUP, INC., ET AL. v. CITIGROUP, INC., ET AL. The complaint alleges that defendants colluded to prevent the development of exchange-like trading for credit default swaps and asserts federal and state antitrust claims and state law tort claims. In January 2020, plaintiffs filed an amended complaint, which defendants later moved to dismiss. Additional information concerning this action is publicly available in court filings under the docket number 17-CV-4302 (S.D.N.Y.) (Sullivan, J.).

Madoff-Related Litigation

In 2008, a Securities Investor Protection Act (SIPA) trustee was appointed for the SIPA liquidation of Bernard L. Madoff Investment Securities LLC (BLMIS), in the United States Bankruptcy Court for the Southern District of New York. Beginning in 2010, the SIPA trustee commenced actions against multiple Citi entities, including Citibank, Citicorp North America, Inc., CGML and Citibank (Switzerland) AG, captioned PICARD v. CITIBANK, N.A., ET AL. and PICARD v. Citibank (Switzerland) Ltd., seeking recovery of monies that originated at BLMIS and were allegedly received by the Citi entities as subsequent transferees.

On February 11, 2022, the SIPA trustee filed an amended complaint against Citibank, Citicorp North America, Inc. and CGML, and subsequently voluntarily dismissed the case against Citibank (Switzerland) AG. On April 22, 2022, these remaining Citi entities moved to dismiss the amended complaint, which the bankruptcy court denied. On November 2, 2022, the remaining Citi entities moved to file an interlocutory appeal of the bankruptcy court's decision. On November 10, 2022, the remaining Citi entities answered the amended complaint. Additional information concerning these actions is publicly available in court filings under the docket numbers 10-5345, 12-1700 (Bankr. S.D.N.Y.) (Morris, J.); and 22-9597 (S.D.N.Y.) (Gardephe, J.).

Beginning in 2010, the British Virgin Islands liquidators of Fairfield Sentry Limited, whose assets were invested with BLMIS, commenced multiple actions against CGML, Citibank (Switzerland) AG, Citibank, NA London, Citivic Nominees Ltd., Cititrust Bahamas Ltd., and Citibank Korea Inc., captioned FAIRFIELD SENTRY LTD., ET AL. v. CITIGROUP GLOBAL MARKETS LTD., ET AL.; FAIRFIELD SENTRY LTD., ET AL. v. CITIBANK (SWITZERLAND) AG, ET AL.; FAIRFIELD SENTRY LTD., ET AL. v. ZURICH CAPITAL MARKETS

COMPANY, ET AL.; FAIRFIELD SENTRY LTD., ET AL. v. CITIBANK NA LONDON, ET AL.; FAIRFIELD SENTRY LTD., ET AL. v. CITIVIC NOMINEES LTD., ET AL.; FAIRFIELD SENTRY LTD., ET AL. v. DON CHIMANGO SA, ET AL.; and FAIRFIELD SENTRY LTD., ET AL. v. CITIBANK KOREA INC. ET AL., in the United States Bankruptcy Court for the Southern District of New York. The actions seek recovery of monies that were allegedly received directly or indirectly from Fairfield Sentry.

In October 2021, Citi (Switzerland) AG and Citivic Nominees Ltd. filed a motion to dismiss for lack of personal jurisdiction, which remains pending. On August 24, 2022, the United States District Court for the Southern District of New York affirmed various decisions of the bankruptcy court, which dismissed claims against CGML, Citibank (Switzerland) AG, Citibank, NA London, Citivic Nominees Ltd., Cititrust Bahamas Ltd., and Citibank Korea Inc., and permitted a single claim against Citibank, NA London, CGML, Citivic Nominees Ltd., and Citibank (Switzerland) AG to proceed. In late September 2022, the liquidators appealed the district court's decision dismissing the liquidators' claims. On September 30, 2022, CGML, Citibank (Switzerland) AG, Citibank, NA London, and Citivic Nominees Ltd. moved for leave to appeal the district court's decision permitting the single claim to proceed against them. Additional information is publicly available in court filings under the docket numbers 10-13164, 10-3496, 10-3622, 10-3634, 10-4100, 10-3640, 11-2770, 12-1142, 12-1298 (Bankr. S.D.N.Y.) (Morris, J.); 19-3911, 19-4267, 19-4396, 19-4484, 19-5106, 19-5135, 19-5109, 21-2997, 21-3243, 21-3526, 21-3529, 21-3530, 21-3998, 21-4307, 21-4498, 21-4496 (S.D.N.Y.) (Broderick, J.); and 22-2101 (consolidated lead appeal), 22-2557, 22-2122, 22-2562, 22-2216, 22-2545, 22-2308, 22-2591, 22-2502, 22-2553, 22-2398, 22-2582 (2d Cir.).

Parmalat Litigation

In 2004, an Italian commissioner appointed to oversee the administration of various Parmalat companies filed a complaint against Citigroup, Citibank, and related parties, alleging that the defendants facilitated a number of frauds by Parmalat insiders. In 2008, a jury rendered a verdict in Citigroup's favor and awarded Citi $431 million. In 2019, the Italian Supreme Court affirmed the decision in the full amount of $431 million. Citigroup has taken steps to enforce the judgment in Italian and Belgian courts. Additional information concerning these actions is publicly available in court filings under the docket numbers 27618/2014, 4133/2019, and 22098/2019 (Italy), and 20/3617/A and 20/4007/A (Brussels).

In 2015, Parmalat filed a claim in an Italian civil court in Milan claiming damages of €1.8 billion against Citigroup, Citibank, and related parties, which the court dismissed on grounds that it was duplicative of Parmalat's previously unsuccessful claims. In 2019, the Milan Court of Appeal rejected Parmalat's appeal of the Milan court's dismissal, which Parmalat appealed with the Italian Supreme Court. Additional information concerning this action is publicly available in court filings under the docket numbers 1009/2018 and 20598/2019.

In January 2020, Parmalat, its three directors, and its sole shareholder, Sofil S.a.s., as co-plaintiffs, filed a claim before the Italian civil court in Milan seeking a declaratory judgment that they do not owe compensatory damages of €990 million to Citibank. In November 2020, Citibank joined the proceedings, seeking dismissal of the declaratory judgment application and filing a counterclaim. Additional information concerning this action is publicly available in court filings under the docket number 8611/2020.

Shareholder Derivative and Securities Litigation

Beginning in October 2020, four derivative actions were filed in the United States District Court for the Southern District of New York, purportedly on behalf of Citigroup (as nominal defendant) against certain of Citigroup's current and former directors. The actions were later consolidated under the case name IN RE CITIGROUP INC. SHAREHOLDER DERIVATIVE LITIGATION. The consolidated complaint asserts claims for breach of fiduciary duty, unjust enrichment, and contribution and indemnification in connection with defendants' alleged failures to implement adequate internal controls. In addition, the consolidated complaint asserts derivative claims for violations of Sections 10(b) and 14(a) of the Securities Exchange Act of 1934 in connection with statements in Citigroup's 2019 and 2020 annual meeting proxy statements. In February 2021, the court stayed the action pending resolution of defendants' motion to dismiss in IN RE CITIGROUP SECURITIES LITIGATION. Additional information concerning this action is publicly available in court filings under the docket number 1:20-CV-09438 (S.D.N.Y.) (Preska, J.).

Beginning in December 2020, two derivative actions were filed in the Supreme Court of the State of New York, purportedly on behalf of Citigroup (as nominal defendant) against certain of Citigroup's current and former directors, and certain current and former officers. The actions were later consolidated under the case name IN RE CITIGROUP INC. DERIVATIVE LITIGATION, and the court stayed the action pending resolution of defendants' motion to dismiss in IN RE CITIGROUP SECURITIES LITIGATION. Additional information concerning this action is publicly available in court filings under the docket number 656759/2020 (N.Y. Sup. Ct.) (Schecter, J.).

On June 23, 2022, a third derivative action was filed in the Supreme Court of the State of New York, also purportedly on behalf of Citigroup (as nominal defendant) against certain of Citigroup's current and former directors, and certain current and former officers. A stipulation to stay and consolidate this action with the Supreme Court of the State of New York action captioned IN RE CITIGROUP INC. DERIVATIVE LITIGATION is pending. Additional information concerning this action is publicly available in court filings under the docket number 656930/2022 (N.Y. Sup. Ct.) (Schecter, J.).

On August 2, 2022, a shareholder derivative action captioned LIPSHUTZ ET AL. v. COSTELLO ET AL. was filed in the United States District Court for the Eastern District of New York, purportedly on behalf of Citigroup (as nominal defendant) against Citigroup's current directors. The action raises substantially the same claims and allegations as IN RE CITIGROUP INC. SHAREHOLDER DERIVATIVE

LITIGATION. The LIPSHUTZ action additionally asserts that plaintiffs made a litigation demand on the Citigroup Board of Directors and that the demand was wrongfully refused. Defendants moved to transfer the new action to the United States District Court for the Southern District of New York. Additional information concerning this action is publicly available in court filings under the docket number 22 Civ. 4547 (E.D.N.Y.) (Kovner, J.).

Beginning in October 2020, three putative class action complaints were filed in the United States District Court for the Southern District of New York against Citigroup and certain of its current and former officers, asserting violations of Sections 10(b) and 20(a) of the Securities Exchange Act of 1934 in connection with defendants' alleged misstatements concerning Citigroup's internal controls. The actions were later consolidated under the case name IN RE CITIGROUP SECURITIES LITIGATION. The consolidated complaint later added certain of Citigroup's current and former directors as defendants. Defendants have moved to dismiss the consolidated amended complaint. Additional information concerning this action is publicly available in court filings under the docket number 1:20-CV-9132 (S.D.N.Y.) (Preska, J.).

Sovereign Securities Matters

Regulatory Actions: Government and regulatory agencies are conducting investigations or making inquiries regarding Citigroup's sales and trading activities in connection with sovereign and other government-related securities. Citigroup is cooperating with these investigations and inquiries.

Antitrust and Other Litigation: In 2015, putative class actions filed against CGMI and other defendants were consolidated under the caption IN RE TREASURY SECURITIES AUCTION ANTITRUST LITIGATION in the United States District Court for the Southern District of New York. Plaintiffs allege that defendants colluded to fix U.S. treasury auction bids by sharing competitively sensitive information ahead of the auctions, and that defendants colluded to boycott and prevent the emergence of an anonymous, all-to-all electronic trading platform in the U.S. Treasuries secondary market. Plaintiffs assert claims under antitrust laws, and seek damages, including treble damages where authorized by statute, and injunctive relief. In March 2021, the court granted defendants' motion to dismiss, without prejudice. In May 2021, plaintiffs filed an amended consolidated complaint. In June 2021, certain defendants, including CGMI, moved to dismiss the amended complaint. On March 31, 2022, the court dismissed the amended complaint with prejudice, and the plaintiffs have appealed that decision to the United States Court of Appeals for the Second Circuit. Additional information concerning this action is publicly available in court filings under the docket number 15-MD-2673 (S.D.N.Y.) (Gardephe, J.).

In 2017, purchasers of supranational, sub-sovereign and agency (SSA) bonds filed a proposed class action on behalf of direct and indirect purchasers of SSA 296 bonds against Citigroup, Citibank, CGMI, CGML, Citibank Canada, Citigroup Global Markets Canada, Inc. and other defendants, captioned JOSEPH MANCINELLI, ET AL. v. BANK OF AMERICA CORPORATION, ET AL., in the Federal Court in Canada. Plaintiffs have filed an amended claim that alleges defendants manipulated, and colluded to manipulate, the SSA bonds market, asserts claims for breach of the Competition Act, breach of foreign law, civil conspiracy, unjust enrichment, waiver of tort and breach of contract, and seeks compensatory and punitive damages, among other relief. Additional information concerning this action is publicly available in court filings under the docket number T-1871-17 (Fed. Ct.).

In 2018, a putative class action was filed against Citigroup, CGMI, Citigroup Financial Products Inc., Citigroup Global Markets Holdings Inc., Citibanamex, Grupo Banamex and other banks, captioned IN RE MEXICAN GOVERNMENT BONDS ANTITRUST LITIGATION, in the United States District Court for the Southern District of New York. The complaint alleges that defendants colluded in the Mexican sovereign bond market. In September 2019, the court granted defendants' motion to dismiss. In December 2019, plaintiffs filed an amended complaint against Citibanamex and other market makers in the Mexican sovereign bond market. Plaintiffs no longer assert any claims against Citigroup or any other U.S. Citi affiliates. The amended complaint alleges a conspiracy to fix prices in the Mexican sovereign bond market, asserts antitrust and unjust enrichment claims, and seeks treble damages, restitution and injunctive relief. In February 2020, certain defendants, including Citibanamex, moved to dismiss the amended complaint. In June 2021, the court granted defendants' motion to dismiss, and the plaintiffs have appealed that decision to the United States Court of Appeals for the Second Circuit. Additional information concerning this action is publicly available in court filings under the docket numbers 18-CV-2830 (S.D.N.Y.) (Oetken, J.) and 22-2039 (2d Cir.).

In February 2021, purchasers of Euro-denominated sovereign debt issued by European central governments added CGMI, CGML and others as defendants to a putative class action, captioned IN RE EUROPEAN GOVERNMENT BONDS ANTITRUST LITIGATION, in the United States District Court for the Southern District of New York. Plaintiffs allege that defendants engaged in a conspiracy to inflate prices of European government bonds in primary market auctions and to fix the prices of European government bonds in secondary markets. Plaintiffs assert a claim under the Sherman Act and seek treble damages and attorneys' fees. On March 14, 2022, the court granted defendants' motion to dismiss the fourth amended complaint as to certain defendants, but denied defendants' motion to dismiss as to other defendants, including CGMI and CGML. On June 16, 2022, the court denied certain defendants' respective motions for reconsideration of the court's denial of defendants' motion to dismiss. In November 2022, plaintiffs moved for leave to amend the complaint. Additional information concerning this action is publicly available in court filings under the docket number 19-CV-2601 (S.D.N.Y.) (Marrero, J.).

Transaction Tax Matters

Citigroup and Citibank are engaged in litigation or examinations with non-U.S. tax authorities concerning the payment of transaction taxes and other non-income tax matters.

Variable Rate Demand Obligation Litigation

In 2019, the plaintiffs in the consolidated actions CITY OF PHILADELPHIA v. BANK OF AMERICA CORP, ET AL. and MAYOR AND CITY COUNCIL OF BALTIMORE v. BANK OF AMERICA CORP., ET AL. filed a consolidated complaint naming as defendants Citigroup, Citibank, CGMI, CGML and numerous other industry participants. The consolidated complaint asserts violations of the Sherman Act, as well as claims for breach of contract, breach of fiduciary duty, and unjust enrichment, and seeks damages and injunctive relief based on allegations that defendants served as remarketing agents for municipal bonds called variable rate demand obligations (VRDOs) and colluded to set artificially high VRDO interest rates. On November 6, 2020, the court granted in part and denied in part defendants' motion to dismiss the consolidated complaint.

In June 2021, the Board of Directors of the San Diego Association of Governments, acting as the San Diego County Regional Transportation Commission, filed a parallel putative class action against the same defendants named in the already pending nationwide consolidated class action. The two actions were consolidated and in August 2021, the plaintiffs in the nationwide putative class action filed a consolidated amended complaint, captioned THE CITY OF PHILADELPHIA, MAYOR AND CITY COUNCIL OF BALTIMORE, THE BOARD OF DIRECTORS OF THE SAN DIEGO ASSOCIATION OF GOVERNMENTS, ACTING AS THE SAN DIEGO COUNTY REGIONAL TRANSPORTATION COMMISSION v. BANK OF AMERICA CORP., ET AL. In September 2021, defendants moved to dismiss the consolidated amended complaint in part. On June 28, 2022, the court granted in part and denied in part defendants' partial motion to dismiss the consolidated amended complaint. On October 27, 2022, plaintiffs filed a motion to certify a class of persons and entities who, from February 2008 to November 2015, paid interest rates on VRDOs with respect to the antitrust claim. The plaintiffs also moved to certify a subclass of individuals who entered into remarketing agreements with the defendants during that same period. Additional information concerning this action is publicly available in court filings under the docket number 19-CV-1608 (S.D.N.Y.) (Furman, J.).

Settlement Payments

Payments required in settlement agreements described above have been made or are covered by existing litigation or other accruals.

30. CONDENSED CONSOLIDATING FINANCIAL STATEMENTS

Citigroup's Registration Statement on Form S-3 on file with the SEC includes its wholly owned subsidiary, Citigroup Global Markets Holdings Inc. (CGMHI), as a co-registrant. Any securities issued by CGMHI under the Form S-3 will be fully and unconditionally guaranteed by Citigroup.

The following are the Condensed Consolidating Statements of Income and Comprehensive Income for the years ended December 31, 2022, 2021 and 2020, Condensed Consolidating Balance Sheet as of December 31, 2022 and 2021 and Condensed Consolidating Statement of Cash Flows for the years ended December 31, 2022, 2021 and 2020 for Citigroup Inc., the parent holding company (Citigroup parent company), CGMHI, other Citigroup subsidiaries and eliminations, and total consolidating adjustments. "Other Citigroup subsidiaries and eliminations" includes all other subsidiaries of Citigroup, intercompany eliminations and income (loss) from discontinued operations. "Consolidating adjustments" includes Citigroup parent company elimination of distributed and undistributed income of subsidiaries and investment in subsidiaries.

These Condensed Consolidating Financial Statements have been prepared and presented in accordance with SEC Regulation S-X Rule 3-10, "Financial Statements of Guarantors and Issuers of Guaranteed Securities Registered or Being Registered."

These Condensed Consolidating Financial Statements are presented for purposes of additional analysis, but should be considered in relation to the Consolidated Financial Statements of Citigroup taken as a whole.

Condensed Consolidating Statements of Income and Comprehensive Income

In millions of dollars	Year ended December 31, 2022				
	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Revenues					
Dividends from subsidiaries	$ 8,992		$ —	$ (8,992)	$ —
Interest revenue	—	10,021	64,387	—	74,408
Interest revenue—intercompany	4,628	2,324	(6,952)	—	—
Interest expense	5,250	5,938	14,552	—	25,740
Interest expense—intercompany	715	4,358	(5,073)	—	—
Net interest income	$ (1,337)	$ 2,049	$ 47,956	$ —	$ 48,668
Commissions and fees	$ —	$ 4,617	$ 4,558	$ —	$ 9,175
Commissions and fees—intercompany	(1)	127	(126)	—	—
Principal transactions	5,147	13,895	(4,883)	—	14,159
Principal transactions—intercompany	(5,686)	(10,532)	16,218	—	—
Other revenue	210	493	2,633	—	3,336
Other revenue—intercompany	(220)	(58)	278	—	—
Total non-interest revenues	$ (550)	$ 8,542	$ 18,678	$ —	$ 26,670
Total revenues, net of interest expense	$ 7,105	$ 10,591	$ 66,634	$ (8,992)	$ 75,338
Provisions for credit losses and for benefits and claims	$ —	$ 10	$ 5,229	$ —	$ 5,239
Operating expenses					
Compensation and benefits	$ 9	$ 5,450	$ 21,196	$ —	$ 26,655
Compensation and benefits—intercompany	12	—	(12)	—	—
Other operating	85	2,962	21,590	—	24,637
Other operating—intercompany	15	2,705	(2,720)	—	—
Total operating expenses	$ 121	$ 11,117	$ 40,054	$ —	$ 51,292
Equity in undistributed income of subsidiaries	$ 6,173	$ —	$ —	$ (6,173)	$ —
Income from continuing operations before income taxes	$ 13,157	$ (536)	$ 21,351	$ (15,165)	$ 18,807
Provision (benefit) for income taxes	(1,688)	(290)	5,620	—	3,642
Income from continuing operations	$ 14,845	$ (246)	$ 15,731	$ (15,165)	$ 15,165
Income (loss) from discontinued operations, net of taxes	—	—	(231)	—	(231)
Net income before attribution of noncontrolling interests	$ 14,845	$ (246)	$ 15,500	$ (15,165)	$ 14,934
Noncontrolling interests	—	—	89	—	89
Net income	$ 14,845	$ (246)	$ 15,411	$ (15,165)	$ 14,845
Comprehensive income					
Add: Other comprehensive income (loss)	$ (8,297)	$ 946	$ (5,120)	$ 4,174	$ (8,297)
Total Citigroup comprehensive income	$ 6,548	$ 700	$ 10,291	$ (10,991)	$ 6,548
Add: Other comprehensive income attributable to noncontrolling interests	$ —	$ —	$ (58)	$ —	$ (58)
Add: Net income attributable to noncontrolling interests	—	—	89	—	89
Total comprehensive income	$ 6,548	$ 700	$ 10,322	$ (10,991)	$ 6,579

Condensed Consolidating Statements of Income and Comprehensive Income

In millions of dollars	Year ended December 31, 2021				
	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Revenues					
Dividends from subsidiaries	$ 6,482	$ —	$ —	$ (6,482)	$ —
Interest revenue	—	3,566	46,909	—	50,475
Interest revenue—intercompany	3,757	531	(4,288)	—	—
Interest expense	4,791	778	2,412	—	7,981
Interest expense—intercompany	294	1,320	(1,614)	—	—
Net interest income	$ (1,328)	$ 1,999	$ 41,823	$ —	$ 42,494
Commissions and fees	$ —	$ 7,770	$ 5,902	$ —	$ 13,672
Commissions and fees—intercompany	(36)	407	(371)	—	—
Principal transactions	976	10,140	(962)	—	10,154
Principal transactions—intercompany	(1,375)	(6,721)	8,096	—	—
Other revenue	(64)	576	5,052	—	5,564
Other revenue—intercompany	(133)	(60)	193	—	—
Total non-interest revenues	$ (632)	$ 12,112	$ 17,910	$ —	$ 29,390
Total revenues, net of interest expense	$ 4,522	$ 14,111	$ 59,733	$ (6,482)	$ 71,884
Provisions for credit losses and for benefits and claims	$ —	$ 6	$ (3,784)	$ —	$ (3,778)
Operating expenses					
Compensation and benefits	$ 10	$ 5,251	$ 19,873	$ —	$ 25,134
Compensation and benefits—intercompany	69	—	(69)	—	—
Other operating	83	2,868	20,108	—	23,059
Other operating—intercompany	11	2,826	(2,837)	—	—
Total operating expenses	$ 173	$ 10,945	$ 37,075	$ —	$ 48,193
Equity in undistributed income of subsidiaries	$ 16,596	$ —	$ —	$ (16,596)	$ —
Income from continuing operations before income taxes	$ 20,945	$ 3,160	$ 26,442	$ (23,078)	$ 27,469
Provision (benefit) for income taxes	(1,007)	625	5,833	—	5,451
Income from continuing operations	$ 21,952	$ 2,535	$ 20,609	$ (23,078)	$ 22,018
Income (loss) from discontinued operations, net of taxes	—	—	7	—	7
Net income (loss) before attribution of noncontrolling interests	$ 21,952	$ 2,535	$ 20,616	$ (23,078)	$ 22,025
Noncontrolling interests	—	—	73	—	73
Net income	$ 21,952	$ 2,535	$ 20,543	$ (23,078)	$ 21,952
Comprehensive income					
Add: Other comprehensive income (loss)	$ (6,707)	$ (76)	$ (450)	$ 526	$ (6,707)
Total Citigroup comprehensive income	$ 15,245	$ 2,459	$ 20,093	$ (22,552)	$ 15,245
Add: Other comprehensive income attributable to noncontrolling interests	$ —	$ —	$ (99)	$ —	$ (99)
Add: Net income attributable to noncontrolling interests	—	—	73	—	73
Total comprehensive income	$ 15,245	$ 2,459	$ 20,067	$ (22,552)	$ 15,219

Condensed Consolidating Statements of Income and Comprehensive Income

	Year ended December 31, 2020				
In millions of dollars	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Revenues					
Dividends from subsidiaries	$ 2,355	$ —	$ —	$ (2,355)	$ —
Interest revenue	—	5,364	52,725	—	58,089
Interest revenue—intercompany	4,162	920	(5,082)	—	—
Interest expense	4,992	1,989	6,357	—	13,338
Interest expense—intercompany	502	2,170	(2,672)	—	—
Net interest income	$ (1,332)	$ 2,125	$ 43,958	$ —	$ 44,751
Commissions and fees	$ —	$ 6,216	$ 5,169	$ —	$ 11,385
Commissions and fees—intercompany	(36)	290	(254)	—	—
Principal transactions	(1,254)	(4,252)	19,391	—	13,885
Principal transactions—intercompany	693	9,064	(9,757)	—	—
Other revenue	(127)	706	4,901	—	5,480
Other revenue—intercompany	111	23	(134)	—	—
Total non-interest revenues	$ (613)	$ 12,047	$ 19,316	$ —	$ 30,750
Total revenues, net of interest expense	$ 410	$ 14,172	$ 63,274	$ (2,355)	$ 75,501
Provisions for credit losses and for benefits and claims	$ —	$ (1)	$ 17,496	$ —	$ 17,495
Operating expenses					
Compensation and benefits	$ (5)	$ 4,941	$ 17,278	$ —	$ 22,214
Compensation and benefits—intercompany	191	—	(191)	—	—
Other operating	37	2,393	19,730	—	22,160
Other operating—intercompany	15	2,317	(2,332)	—	—
Total operating expenses	$ 238	$ 9,651	$ 34,485	$ —	$ 44,374
Equity in undistributed income of subsidiaries	$ 9,894	$ —	$ —	$ (9,894)	$ —
Income from continuing operations before income taxes	$ 10,066	$ 4,522	$ 11,293	$ (12,249)	$ 13,632
Provision (benefit) for income taxes	(981)	1,249	2,257	—	2,525
Income from continuing operations	$ 11,047	$ 3,273	$ 9,036	$ (12,249)	$ 11,107
Income (loss) from discontinued operations, net of taxes	—	—	(20)	—	(20)
Net income before attribution of noncontrolling interests	$ 11,047	$ 3,273	$ 9,016	$ (12,249)	$ 11,087
Noncontrolling interests	—	—	40	—	40
Net income	$ 11,047	$ 3,273	$ 8,976	$ (12,249)	$ 11,047
Comprehensive income					
Add: Other comprehensive income (loss)	$ 4,260	$ (223)	$ 4,244	$ (4,021)	$ 4,260
Total Citigroup comprehensive income	$ 15,307	$ 3,050	$ 13,220	$ (16,270)	$ 15,307
Add: Other comprehensive income attributable to noncontrolling interests	$ —	$ —	$ 26	$ —	$ 26
Add: Net income attributable to noncontrolling interests	—	—	40	—	40
Total comprehensive income	$ 15,307	$ 3,050	$ 13,286	$ (16,270)	$ 15,373

Condensed Consolidating Balance Sheet

In millions of dollars	December 31, 2022				
	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Assets					
Cash and due from banks	$ —	$ 955	$ 29,622	$ —	$ 30,577
Cash and due from banks—intercompany	15	7,448	(7,463)	—	—
Deposits with banks, net of allowance	—	7,902	303,546	—	311,448
Deposits with banks—intercompany	3,000	10,816	(13,816)	—	—
Securities borrowed and purchased under resale agreements	—	286,724	78,677	—	365,401
Securities borrowed and purchased under resale agreements—intercompany	—	19,549	(19,549)	—	—
Trading account assets	130	202,678	131,306	—	334,114
Trading account assets—intercompany	176	7,279	(7,455)	—	—
Investments, net of allowance	1	265	526,316	—	526,582
Loans, net of unearned income	—	1,749	655,472	—	657,221
Loans, net of unearned income—intercompany	—	337	(337)	—	—
Allowance for credit losses on loans (ACLL)	—	—	(16,974)	—	(16,974)
Total loans, net	$ —	$ 2,086	$ 638,161	$ —	$ 640,247
Advances to subsidiaries	$ 146,843	$ —	$ (146,843)	$ —	$ —
Investments in subsidiary bank holding company	172,721	—	—	(172,721)	—
Investments in non-bank subsidiaries	48,295	—	—	(48,295)	—
Other assets, net of allowance[1]	10,441	66,753	131,113	—	208,307
Other assets—intercompany	3,346	94,716	(98,062)	—	—
Total assets	$ 384,968	$ 707,171	$ 1,545,553	$ (221,016)	$ 2,416,676
Liabilities and equity					
Deposits	$ —	$ —	$ 1,365,954	$ —	$ 1,365,954
Deposits—intercompany	—	—	—	—	—
Securities loaned and sold under repurchase agreements	—	181,765	20,679	—	202,444
Securities loaned and sold under repurchase agreements—intercompany	—	64,151	(64,151)	—	—
Trading account liabilities	23	108,940	61,684	—	170,647
Trading account liabilities—intercompany	581	6,989	(7,570)	—	—
Short-term borrowings	—	20,382	26,714	—	47,096
Short-term borrowings—intercompany	—	23,468	(23,468)	—	—
Long-term debt	166,257	88,844	16,505	—	271,606
Long-term debt—intercompany	—	83,224	(83,224)	—	—
Advances from subsidiary bank holding company	6,629	—	(6,629)	—	—
Advances from non-bank subsidiaries	7,933	—	(7,933)	—	—
Other liabilities	2,321	75,040	79,730	—	157,091
Other liabilities—intercompany	35	15,530	(15,565)	—	—
Stockholders' equity	201,189	38,838	182,827	(221,016)	201,838
Total liabilities and equity	$ 384,968	$ 707,171	$ 1,545,553	$ (221,016)	$ 2,416,676

(1) Citigroup parent company and Other Citigroup subsidiaries at December 31, 2022 included $40.2 billion of placements to Citibank and its branches, of which $29.2 billion had a remaining term of less than 30 days.

Condensed Consolidating Balance Sheet

In millions of dollars	December 31, 2021				
	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Assets					
Cash and due from banks	$ —	$ 834	$ 26,681	$ —	$ 27,515
Cash and due from banks—intercompany	17	6,890	(6,907)	—	—
Deposits with banks, net of allowance	—	7,936	226,582	—	234,518
Deposits with banks—intercompany	3,500	11,005	(14,505)	—	—
Securities borrowed and purchased under resale agreements	—	269,608	57,680	—	327,288
Securities borrowed and purchased under resale agreements—intercompany	—	23,362	(23,362)	—	—
Trading account assets	248	189,841	141,856	—	331,945
Trading account assets—intercompany	1,215	1,438	(2,653)	—	—
Investments, net of allowance	1	224	512,597	—	512,822
Loans, net of unearned income	—	2,293	665,474	—	667,767
Loans, net of unearned income—intercompany	—	—	—	—	—
Allowance for credit losses on loans (ACLL)	—	—	(16,455)	—	(16,455)
Total loans, net	$ —	$ 2,293	$ 649,019	$ —	$ 651,312
Advances to subsidiaries	$ 142,144	$ —	$ (142,144)	$ —	$ —
Investments in subsidiary bank holding company	175,849	—	—	(175,849)	—
Investments in non-bank subsidiaries	47,454	—	—	(47,454)	—
Other assets, net of allowance[1]	10,589	69,312	126,112	—	206,013
Other assets—intercompany	2,737	60,567	(63,304)	—	—
Total assets	$ 383,754	$ 643,310	$ 1,487,652	$ (223,303)	$ 2,291,413
Liabilities and equity					
Deposits	$ —	$ —	$ 1,317,230	$ —	$ 1,317,230
Deposits—intercompany	—	—	—	—	—
Securities loaned and sold under repurchase agreements	—	171,818	19,467	—	191,285
Securities loaned and sold under repurchase agreements—intercompany	—	62,197	(62,197)	—	—
Trading account liabilities	17	122,383	39,129	—	161,529
Trading account liabilities—intercompany	777	500	(1,277)	—	—
Short-term borrowings	—	13,425	14,548	—	27,973
Short-term borrowings—intercompany	—	17,230	(17,230)	—	—
Long-term debt	164,945	61,416	28,013	—	254,374
Long-term debt—intercompany	—	76,335	(76,335)	—	—
Advances from subsidiary bank holding company	5,426	—	(5,426)	—	—
Advances from non-bank subsidiaries	8,043	—	(8,043)	—	—
Other liabilities	2,574	68,206	65,570	—	136,350
Other liabilities—intercompany	—	11,774	(11,774)	—	—
Stockholders' equity	201,972	38,026	185,977	(223,303)	202,672
Total liabilities and equity	$ 383,754	$ 643,310	$ 1,487,652	$ (223,303)	$ 2,291,413

(1) Citigroup parent company and Other Citigroup subsidiaries at December 31, 2021 included $30.5 billion of placements to Citibank and its branches, of which $19.5 billion had a remaining term of less than 30 days.

Condensed Consolidating Statement of Cash Flows

	Year ended December 31, 2022				
In millions of dollars	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Net cash provided by (used in) operating activities of continuing operations	$ 156	$ (18,505)	$ 43,418	$ —	$ 25,069
Cash flows from investing activities of continuing operations					
Available-for-sale debt securities:					
Purchases of investments	$ —	$ —	$ (218,747)	$ —	$ (218,747)
Proceeds from sales of investments	—	—	79,687	—	79,687
Proceeds from maturities of investments	—	—	140,934	—	140,934
Held-to-maturity debt securities:					
Purchases of investments	—	—	(42,903)	—	(42,903)
Proceeds from maturities of investments	—	—	12,188	—	12,188
Change in loans	—	—	(16,591)	—	(16,591)
Proceeds from sales and securitizations of loans	—	—	4,709	—	4,709
Proceeds from divestitures	—	—	5,741	—	5,741
Change in securities borrowed and purchased under agreements to resell	—	(13,303)	(24,810)	—	(38,113)
Changes in investments and advances—intercompany	(7,815)	(33,929)	41,744	—	—
Other investing activities	—	(65)	(6,295)	—	(6,360)
Net cash used in investing activities of continuing operations	$ (7,815)	$ (47,297)	$ (24,343)	$ —	$ (79,455)
Cash flows from financing activities of continuing operations					
Dividends paid	$ (5,003)	$ (281)	$ 281	$ —	$ (5,003)
Issuance of preferred stock	—	—	—	—	—
Redemption of preferred stock	—	—	—	—	—
Treasury stock acquired	(3,250)	—	—	—	(3,250)
Proceeds (repayments) from issuance of long-term debt, net	14,661	34,162	(1,160)	—	47,663
Proceeds (repayments) from issuance of long-term debt—intercompany, net	—	11,089	(11,089)	—	—
Change in deposits	—	—	68,415	—	68,415
Change in securities loaned and sold under agreements to repurchase	—	11,901	(742)	—	11,159
Change in short-term borrowings	—	6,957	12,166	—	19,123
Net change in short-term borrowings and other advances—intercompany	1,093	2,038	(3,131)	—	—
Capital contributions from (to) parent	—	380	(380)	—	—
Other financing activities	(344)	12	(12)	—	(344)
Net cash provided by financing activities of continuing operations	$ 7,157	$ 66,258	$ 64,348	$ —	$ 137,763
Effect of exchange rate changes on cash and due from banks	$ —	$ —	$ (3,385)	$ —	$ (3,385)
Change in cash and due from banks and deposits with banks	$ (502)	$ 456	$ 80,038	$ —	$ 79,992
Cash and due from banks and deposits with banks at beginning of year	3,517	26,665	231,851	—	262,033
Cash and due from banks and deposits with banks at end of year	$ 3,015	$ 27,121	$ 311,889	$ —	$ 342,025
Cash and due from banks (including segregated cash and other deposits)	$ 15	$ 8,403	$ 22,159	$ —	$ 30,577
Deposits with banks, net of allowance	3,000	18,718	289,730	—	311,448
Cash and due from banks and deposits with banks at end of year	$ 3,015	$ 27,121	$ 311,889	$ —	$ 342,025
Supplemental disclosure of cash flow information for continuing operations					
Cash paid (received) during the year for income taxes	$ (1,269)	$ 363	$ 4,639	$ —	$ 3,733
Cash paid during the year for interest	1,309	9,936	11,370	—	22,615
Non-cash investing activities					
Transfer of investment securities from AFS to HTM	$ —	$ —	$ 21,688	$ —	$ 21,688
Decrease in net loans associated with divestitures reclassified to HFS	—	—	16,956	—	16,956
Decrease in goodwill associated with divestitures reclassified to HFS	—	—	876	—	876
Transfers to loans HFS (*Other assets*) from loans	—	—	5,582	—	5,582
Non-cash financing activities					
Decrease in deposits associated with significant disposals reclassified to HFS	$ —	$ —	$ 19,691	$ —	$ 19,691

Condensed Consolidating Statement of Cash Flows

In millions of dollars	Year ended December 31, 2021				
	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Net cash provided by (used in) operating activities of continuing operations	$ 3,947	$ 43,227	$ (84)	$ —	$ 47,090
Cash flows from investing activities of continuing operations					
Available-for-sale debt securities:					
Purchases of investments	$ —	$ —	$ (205,980)	$ —	$ (205,980)
Proceeds from sales of investments	—	—	125,895	—	125,895
Proceeds from maturities of investments	—	—	120,936	—	120,936
Held-to-maturity debt securities:					
Purchases of investments	—	—	(136,450)	—	(136,450)
Proceeds from maturities of investments	—	—	21,164	—	21,164
Change in loans	—	—	(1,173)	—	(1,173)
Proceeds from sales and securitizations of loans	—	—	2,918	—	2,918
Change in securities borrowed and purchased under agreements to resell	—	(29,944)	(2,632)	—	(32,576)
Changes in investments and advances—intercompany	8,260	(9,040)	780	—	—
Other investing activities	—	(2)	(5,478)	—	(5,480)
Net cash provided by (used in) investing activities of continuing operations	$ 8,260	$ (38,986)	$ (80,020)	$ —	$ (110,746)
Cash flows from financing activities of continuing operations					
Dividends paid	$ (5,198)	$ (196)	$ 196	$ —	$ (5,198)
Issuance of preferred stock	3,300	—	—	—	3,300
Redemption of preferred stock	(3,785)	—	—	—	(3,785)
Treasury stock acquired	(7,601)	—	—	—	(7,601)
Proceeds from issuance of long-term debt, net	(86)	15,071	(19,277)	—	(4,292)
Proceeds (repayments) from issuance of long-term debt—intercompany, net	—	14,410	(14,410)	—	—
Change in deposits	—	—	44,966	—	44,966
Change in securities loaned and sold under agreements to repurchase	—	(27,241)	19,001	—	(8,240)
Change in short-term borrowings	—	1,102	(2,643)	—	(1,541)
Net change in short-term borrowings and other advances—intercompany	501	(917)	416	—	—
Capital contributions from (to) parent	—	71	(71)	—	—
Other financing activities	(337)	12	(12)	—	(337)
Net cash provided by (used in) financing activities of continuing operations	$ (13,206)	$ 2,312	$ 28,166	$ —	$ 17,272
Effect of exchange rate changes on cash and due from banks	$ —	$ —	$ (1,198)	$ —	$ (1,198)
Change in cash and due from banks and deposits with banks	$ (999)	$ 6,553	$ (53,136)	$ —	$ (47,582)
Cash and due from banks and deposits with banks at beginning of year	4,516	20,112	284,987	—	309,615
Cash and due from banks and deposits with banks at end of year	$ 3,517	$ 26,665	$ 231,851	$ —	$ 262,033
Cash and due from banks (including segregated cash and other deposits)	$ 17	$ 7,724	$ 19,774	$ —	$ 27,515
Deposits with banks, net of allowance	3,500	18,941	212,077	—	234,518
Cash and due from banks and deposits with banks at end of year	$ 3,517	$ 26,665	$ 231,851	$ —	$ 262,033
Supplemental disclosure of cash flow information for continuing operations					
Cash paid (received) during the year for income taxes	$ (2,406)	$ 919	$ 5,515	$ —	$ 4,028
Cash paid during the year for interest	3,101	2,210	1,832	—	7,143
Non-cash investing activities					
Decrease in net loans associated with divestitures reclassified to HFS	$ —	$ —	$ 9,945	$ —	$ 9,945
Transfers to loans HFS (*Other assets*) from loans	—	—	7,414	—	7,414
Non-cash financing activities					
Decrease in long-term debt associated with divestitures reclassified to HFS	$ —	$ —	$ 479	$ —	$ 479
Decrease in deposits associated with divestitures reclassified to HFS reclassified to HFS	—	—	8,407	—	8,407

Condensed Consolidating Statements of Cash Flows

In millions of dollars	Year ended December 31, 2020				
	Citigroup parent company	CGMHI	Other Citigroup subsidiaries and eliminations	Consolidating adjustments	Citigroup consolidated
Net cash provided by (used in) operating activities of continuing operations	$ 5,002	$ (26,195)	$ (2,295)	$ —	$ (23,488)
Cash flows from investing activities of continuing operations					
Available-for-sale debt securities:					
Purchases of investments	$ —	$ —	$ (306,801)	$ —	$ (306,801)
Proceeds from sales of investments	—	—	144,035	—	144,035
Proceeds from maturities of investments	—	—	110,941	—	110,941
Held-to-maturity debt securities:					
Purchases of investments	—	—	(25,586)	—	(25,586)
Proceeds from maturities of investments	—	—	15,215	—	15,215
Change in loans	—	—	14,249	—	14,249
Proceeds from sales and securitizations of loans	—	—	1,495	—	1,495
Change in securities borrowed and purchased under agreements to resell	—	(46,044)	2,654	—	(43,390)
Changes in investments and advances—intercompany	(5,584)	(6,917)	12,501	—	—
Other investing activities	—	(54)	(2,549)	—	(2,603)
Net cash provided by (used in) investing activities of continuing operations	$ (5,584)	$ (53,015)	$ (33,846)	$ —	$ (92,445)
Cash flows from financing activities of continuing operations					
Dividends paid	$ (5,352)	$ (172)	$ 172	$ —	$ (5,352)
Issuance of preferred stock	2,995	—	—	—	2,995
Redemption of preferred stock	(1,500)	—	—	—	(1,500)
Treasury stock acquired	(2,925)	—	—	—	(2,925)
Proceeds (repayments) from issuance of long-term debt, net	16,798	6,349	(10,091)	—	13,056
Proceeds (repayments) from issuance of long-term debt—intercompany, net	—	3,960	(3,960)	—	—
Change in deposits	—	—	210,081	—	210,081
Change in securities loaned and sold under agreements to repurchase	—	79,322	(46,136)	—	33,186
Change in short-term borrowings	—	1,228	(16,763)	—	(15,535)
Net change in short-term borrowings and other advances—intercompany	(7,528)	(7,806)	15,334	—	—
Other financing activities	(411)	—	—	—	(411)
Net cash provided by financing activities of continuing operations	$ 2,077	$ 82,881	$ 148,637	$ —	$ 233,595
Effect of exchange rate changes on cash and due from banks	$ —	$ —	$ (1,966)	$ —	$ (1,966)
Change in cash and due from banks and deposits with banks	$ 1,495	$ 3,671	$ 110,530	$ —	$ 115,696
Cash and due from banks and deposits with banks at beginning of year	3,021	16,441	174,457	—	193,919
Cash and due from banks and deposits with banks at end of year	$ 4,516	$ 20,112	$ 284,987	$ —	$ 309,615
Cash and due from banks (including segregated cash and other deposits)	$ 16	$ 6,709	$ 19,624	$ —	$ 26,349
Deposits with banks, net of allowance	4,500	13,403	265,363	—	283,266
Cash and due from banks and deposits with banks at end of year	$ 4,516	$ 20,112	$ 284,987	$ —	$ 309,615
Supplemental disclosure of cash flow information for continuing operations					
Cash paid (received) during the year for income taxes	$ (1,883)	$ 1,138	$ 5,542	$ —	$ 4,797
Cash paid during the year for interest	2,681	4,516	4,897	—	12,094
Non-cash investing activities					
Transfers to loans HFS (*Other assets*) from loans	$ —	$ —	$ 2,614	$ —	$ 2,614

FINANCIAL DATA SUPPLEMENT

RATIOS

	2022	2021	2020
Return on average assets	**0.62%**	0.94 %	0.50%
Return on average common stockholders' equity[1]	**7.7**	11.5	5.7
Return on average total stockholders' equity[2]	**7.5**	10.9	5.7
Total average equity to average assets[3]	**8.3**	8.6	8.7
Dividend payout ratio[4]	**29**	20	43

(1) Based on Citigroup's net income less preferred stock dividends as a percentage of average common stockholders' equity.
(2) Based on Citigroup's net income as a percentage of average total Citigroup stockholders' equity.
(3) Based on average Citigroup stockholders' equity as a percentage of average assets.
(4) Dividends declared per common share as a percentage of diluted EPS.

AVERAGE DEPOSIT LIABILITIES IN OFFICES OUTSIDE THE U.S.[1]

	2022		2021		2020	
In millions of dollars at year end, except ratios	**Average interest rate**	**Average balance**	Average interest rate	Average balance	Average interest rate	Average balance
Banks	**0.66%**	**$ 32,094**	0.16%	$ 42,222	0.10%	$ 130,970
Other demand deposits	**0.49**	**394,488**	0.15	412,815	0.33	311,342
Other time and savings deposits	**1.79**	**190,448**	0.55	200,194	0.94	210,896
Total	**0.90%**	**$ 617,030**	0.28%	$ 655,231	0.48%	$ 653,208

(1) Interest rates and amounts include the effects of risk management activities and also reflect the impact of the local interest rates prevailing in certain countries.

UNINSURED DEPOSITS

The table below shows the estimated amount of uninsured time deposits by maturity profile:

In millions of dollars at December 31, 2022	**Under 3 months or less**	**Over 3 months but within 6 months**	**Over 6 months but within 12 months**	**Over 12 months**	**Total**
In U.S. offices[1]					
Time deposits in excess of FDIC insurance limits[2]	**$ 24,534**	**$ 11,556**	**$ 22,868**	**$ 2,642**	**$ 61,600**
In offices outside the U.S.[1]					
Time deposits in excess of foreign jurisdiction insurance limits[3]	**128,189**	**9,289**	**12,125**	**1,318**	**150,921**
Total uninsured time deposits[4]	**$ 152,723**	**$ 20,845**	**$ 34,993**	**$ 3,960**	**$ 212,521**

(1) The classification between offices in the U.S. and outside the U.S. is based on the domicile of the booking unit, rather than the domicile of the depositor.
(2) The standard insurance amount is $250,000 and $500,000 per depositor, per insured bank, for single and joint account ownership categories, respectively.
(3) For purposes of this presentation, time deposits in offices outside the U.S. are deemed to be uninsured.
(4) The maturity term is based on the remaining term of the time deposit rather than the original maturity date.

Total uninsured deposits as of December 31, 2022 were $1.16 trillion (see footnotes 1, 2 and 3 to the table above).

SUPERVISION, REGULATION AND OTHER

SUPERVISION AND REGULATION

Citi is subject to regulation under U.S. federal and state laws, as well as applicable laws in the other jurisdictions in which it does business.

General

Citigroup is a registered bank holding company and financial holding company and is regulated and supervised by the Federal Reserve Board (FRB). Citigroup's nationally chartered subsidiary banks, including Citibank, are regulated and supervised by the Office of the Comptroller of the Currency (OCC). The Federal Deposit Insurance Corporation (FDIC) also has examination authority for banking subsidiaries whose deposits it insures. Overseas branches of Citibank are regulated and supervised by the FRB and OCC and overseas subsidiary banks by the FRB. These overseas branches and subsidiary banks are also regulated and supervised by regulatory authorities in the host countries. In addition, the Consumer Financial Protection Bureau regulates consumer financial products and services. Citi is also subject to laws and regulations concerning the collection, use, sharing and disposition of certain customer, employee and other personal and confidential information, including those imposed by the Gramm-Leach-Bliley Act, the Fair Credit Reporting Act and the EU General Data Protection Regulation. For more information on U.S. and foreign regulation affecting or potentially affecting Citi, see "Managing Global Risk—Capital Resources" and "—Liquidity Risk" and "Risk Factors" above.

Other Bank and Bank Holding Company Regulation

Citi, including its banking subsidiaries, is subject to regulatory limitations, including requirements as to liquidity, risk-based capital and leverage (see "Capital Resources" above and Note 19), restrictions on the types and amounts of loans that may be made and the interest that may be charged, and limitations on investments that can be made and services that can be offered. The FRB may also expect Citi to commit resources to its subsidiary banks in certain circumstances. Citi is also subject to anti-money laundering and financial transparency laws, including standards for verifying client identification at account opening and obligations to monitor client transactions and report suspicious activities.

Securities and Commodities Regulation

Citi conducts securities underwriting, brokerage and dealing activities in the U.S. through Citigroup Global Markets Inc. (CGMI), its primary broker-dealer, and other broker-dealer subsidiaries, which are subject to regulations of the U.S. Securities and Exchange Commission (SEC), the Financial Industry Regulatory Authority and certain exchanges. Citi conducts similar securities activities outside the U.S., subject to local requirements, through various subsidiaries and affiliates, principally Citigroup Global Markets Limited in London (CGML), which is regulated principally by the U.K. Financial Conduct Authority and Prudential Regulation Authority (PRA), and Citigroup Global Markets Japan Inc. in Tokyo, which is regulated principally by the Financial Services Agency of Japan.

Citi also has subsidiaries that are members of futures exchanges and derivatives clearinghouses. In the U.S., CGMI is a member of the principal U.S. futures exchanges and clearinghouses, and Citi has subsidiaries that are registered as futures commission merchants and commodity pool operators with the Commodity Futures Trading Commission (CFTC). Citibank, CGMI, Citigroup Energy Inc., Citigroup Global Markets Europe AG (CGME) and CGML are also registered as swap dealers with the CFTC (for additional information, see below). CGMI is also subject to SEC and CFTC rules that specify uniform minimum net capital requirements. Compliance with these rules could limit those operations of CGMI that require the intensive use of capital and also limits the ability of broker-dealers to transfer large amounts of capital to parent companies and other affiliates. See "Capital Resources" above and Note 19 for a further discussion of capital considerations of Citi's non-banking subsidiaries.

Recent Rules Regarding Swap Dealers/Security-Based Swap Dealers

On July 22, 2020, the CFTC adopted final rules establishing capital and financial reporting requirements for swap dealers that took effect in October 2021.

In addition, the SEC has adopted rules governing the registration and regulation of security-based swap dealers. The regulations include requirements related to (i) capital, margin and segregation, (ii) record-keeping, reporting and notification and (iii) risk management practices for uncleared security-based swaps and the cross-border application of certain security-based swap requirements. These requirements also took effect in November 2021. Citibank, CGML and CGME registered with the SEC as security-based swap dealers.

Transactions with Affiliates

Transactions between Citi's U.S. subsidiary depository institutions and their non-bank affiliates are regulated by the FRB, and are generally required to be on arm's-length terms. See "Managing Global Risk—Liquidity Risk" above.

COMPETITION

The financial services industry is highly competitive. Citi's competitors include a variety of financial services and advisory companies, as well as certain non-financial services firms. Citi competes for clients and capital (including deposits and funding in the short- and long-term debt markets) with some of these competitors globally and with others on a regional or product basis. Citi's competitive position depends on many factors, including, among others, the value of Citi's brand name, reputation, the types of clients and geographies served; the quality, range, performance, innovation and pricing of products and services; the effectiveness of and access to distribution channels, maintenance of partner relationships, emerging technologies and technology advances, customer service and convenience; the effectiveness of transaction execution, interest rates, lending limits and risk appetite; regulatory constraints and compliance; and changes in the

macroeconomic business environment or societal norms. Citi's ability to compete effectively also depends upon its ability to attract new colleagues and retain and motivate existing colleagues, while managing compensation and other costs. For additional information on competitive factors and uncertainties impacting Citi's businesses, see "Risk Factors—Strategic Risks" above.

DISCLOSURE PURSUANT TO SECTION 219 OF THE IRAN THREAT REDUCTION AND SYRIA HUMAN RIGHTS ACT

Pursuant to Section 219 of the Iran Threat Reduction and Syria Human Rights Act of 2012 (Section 219), which added Section 13(r) to the Securities Exchange Act of 1934, as amended, Citi is required to disclose in its annual or quarterly reports, as applicable, whether it or any of its affiliates knowingly engaged in certain activities, transactions or dealings relating to Iran or with certain individuals or entities that are the subject of sanctions under U.S. law. Disclosure is generally required even where the activities, transactions or dealings were conducted in compliance with applicable law. Citi, in its First Quarter of 2022 Form 10-Q, identified and reported certain activities pursuant to Section 219 for the first quarter of 2022. Citi did not report any activities pursuant to Section 219 in its Second Quarter of 2022 Form 10-Q or Third Quarter of 2022 Form 10-Q. During the fourth quarter of 2022, Citigroup identified seven transactions pursuant to Section 219 related to the second, third and fourth quarters of 2022.

Between April 2022 and July 2022, a Citigroup subsidiary processed four payments to cover the service and insurance fees on a now closed credit card held by a Specially Designated National, who was designated pursuant to the Weapons of Mass Destruction Proliferators Sanctions Regulations. The total value of the payments was equivalent to USD 14.29, and they were assessed for the period after the designation but prior to the closure of the account. Citi did not realize any additional fees for the processing of the payments. Once identified, the transactions were disclosed to the U.S. Department of the Treasury's Office of Foreign Assets Control (OFAC).

On October 19, 2022, Citibank, N.A., New York Branch, participated in a transaction that indirectly involved the Foreign Trade Bank of the Democratic People's Republic of Korea when it processed a funds transfer from an international organization to the account of the Permanent Mission of the Democratic People's Republic of Korea (DPRK) at the international organization's Federal Credit Union. The total value of the payment was approximately USD 1,000,000 and was a payment to fund the international organization's humanitarian activities in the DPRK and the operations of the DPRK mission. This transaction was made pursuant to a license issued by OFAC on September 27, 2022, which expires on September 30, 2023. Citi realized nominal fees for the processing of the payment.

In November 2022, Citibank, N.A., acting as an intermediary bank, processed a transfer of funds from the accounts of subsidiaries of the Islamic Republic of Iran Shipping Lines held at Société Générale bank, Paris, to Commerzbank AG, Hamburg, to satisfy a judgment from the Commercial Court of Paris. The total value of the payment was USD 22,610,822.13 and the transaction was authorized pursuant to a license issued by OFAC on May 3, 2022, which expires on May 31, 2024. Citi realized nominal fees for the processing of the payment.

On December 27, 2022, two subsidiaries of Citigroup processed a transaction between the Central Bank of Iran (the CBI) and an international organization. The CBI sent funds to the international organization's Korean won account at Citibank Korea Inc., which were then converted to U.S. dollars and transferred to the international organization's U.S. dollar account at Citibank, N.A., New York Branch. The total value of the payment was USD 20,573,794.74. The transaction was a payment for the Government of Iran's membership dues to the international organization. Citi obtained a two-year license from OFAC for such payments, expiring on May 31, 2023. Citi realized nominal fees for the processing of the payment.

UNREGISTERED SALES OF EQUITY SECURITIES, REPURCHASES OF EQUITY SECURITIES AND DIVIDENDS

Unregistered Sales of Equity Securities

None.

Equity Security Repurchases

All large banks, including Citi, are subject to limitations on capital distributions in the event of a breach of any regulatory capital buffers, including the Stress Capital Buffer, with the degree of such restrictions based on the extent to which the buffers are breached. For additional information, see "Capital Resources—Regulatory Capital Buffers" and "Risk Factors—Strategic Risks" above.

Citi did not have any share repurchases in the fourth quarter of 2022, other than repurchases relating to issuances of common stock related to employee stock ownership plans. For information on Citi's pause of common share repurchases, see "Executive Summary" above.

During the quarter, pursuant to Citigroup's Board of Directors' authorization, Citi withheld an insignificant number of shares of common stock, added to treasury stock, related to activity on employee stock programs to satisfy employee tax requirements.

Dividends

Citi paid common dividends of $0.51 per share for the fourth quarter of 2022 and the first quarter of 2023. As previously announced, Citi intends to maintain its planned capital actions, which include a quarterly common dividend of at least $0.51 per share, subject to financial and macroeconomic conditions as well as Board of Directors' approval.

As discussed above, Citi's ability to pay common stock dividends is subject to limitations on capital distributions in the event of a breach of any regulatory capital buffers, including the Stress Capital Buffer, with the degree of such restrictions based on the extent to which the buffers are breached. For additional information, see "Capital Resources —Regulatory Capital Buffers" and "Risk Factors—Strategic Risks" above.

Any dividend on Citi's outstanding common stock would also need to be in compliance with Citi's obligations on its outstanding preferred stock.

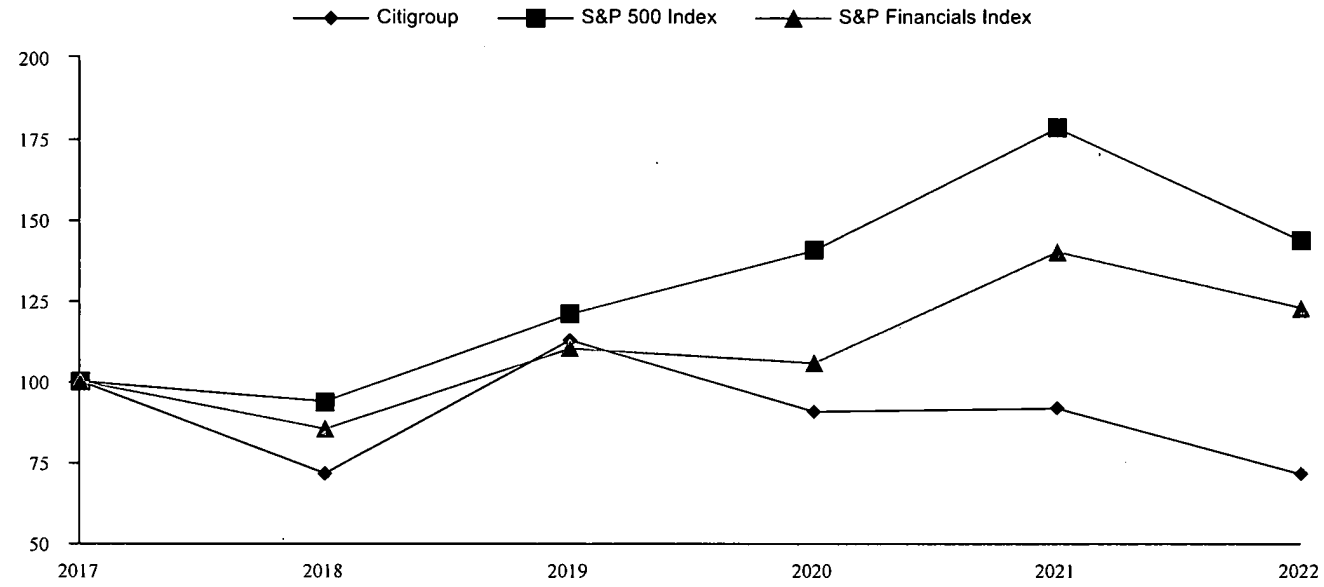
During 2022, Citi distributed $1,032 million in dividends on its outstanding preferred stock. On January 11, 2023, Citi declared preferred dividends of approximately $277 million for the first quarter of 2023.

See Note 19 for information on the ability of Citigroup's subsidiary depository institutions to pay dividends.

PERFORMANCE GRAPH

Comparison of Five-Year Cumulative Total Return
The following graph and table compare the cumulative total return on Citi's common stock with the cumulative total return of the S&P 500 Index and the S&P Financials Index over the five-year period through December 31, 2022. The graph and table assume that $100 was invested on December 31, 2017 in Citi's common stock, the S&P 500 Index and the S&P Financials Index, and that all dividends were reinvested.

Comparison of Five-Year Cumulative Total Return
For the years ended



DATE	Citigroup	S&P 500 Index	S&P Financials Index
31-Dec-2017	100.0	100.0	100.0
31-Dec-2018	71.5	93.8	85.3
31-Dec-2019	112.8	120.8	110.2
31-Dec-2020	90.7	140.5	105.7
31-Dec-2021	91.6	178.3	140.1
31-Dec-2022	71.3	143.6	122.8

Note: Citi's common stock is listed on the NYSE under the ticker symbol "C" and held by 60,813 common stockholders of record as of January 31, 2023.

CORPORATE INFORMATION

EXECUTIVE OFFICERS

Citigroup's executive officers as of February 24, 2023 are:

Name	Age	Position and office held
Peter Babej	59	CEO, Asia Pacific
Titi Cole	50	CEO, Legacy Franchises
Jane Fraser	55	Chief Executive Officer, Citigroup Inc.
Sunil Garg	57	Chief Executive Officer, Citibank, N.A.
David Livingstone	59	CEO, Europe, Middle East and Africa
Mark A. L. Mason	53	Chief Financial Officer
Brent McIntosh	49	General Counsel and Corporate Secretary
Johnbull Okpara	51	Controller and Chief Accounting Officer
Karen Peetz	67	Chief Administrative Officer
Anand Selvakesari	55	CEO, Personal Banking and Wealth Management
Edward Skyler	49	Head of Enterprise Services & Public Affairs
Ernesto Torres Cantú	58	CEO, Latin America
Zdenek Turek	58	Chief Risk Officer
Sara Wechter	42	Head of Human Resources
Mike Whitaker	59	Head of Enterprise Operations and Technology
Paco Ybarra	61	CEO, Institutional Clients Group

The following executive officers have not held their current executive officer positions with Citigroup for at least five years:

- Mr. Babej joined Citi in 2010 and assumed his current position in October 2019. Previously, he served as *ICG*'s Global Head of the Financial Institutions Group (FIG) from January 2017 to October 2019 and Global Co-Head of FIG from 2010 to January 2017. Prior to joining Citi, Mr. Babej served as Co-Head, Financial Institutions—Americas at Deutsche Bank, among other roles;
- Ms. Cole joined Citi in her current position in February 2022. Previously, she served as *PBWM*'s Head of Global Operations and Fraud Prevention and Chief Client Officer. Prior to joining Citi, Ms. Cole served as Head of Consumer and Small Business Banking Operations and Contact Centers at Wells Fargo, and before that, led Retail Products and Underwriting for Bank of America;
- Ms. Fraser joined Citi in 2004 and assumed her current position on February 26, 2021. Previously, she served as CEO of (the former) *Global Consumer Banking* from October 2019 to December 2020. Before that, she served as CEO of Citi Latin America from June 2015 to October 2019. She held a number of other roles across the organization, including CEO of U.S. Consumer and Commercial Banking and CitiMortgage, CEO of Citi's Global Private Bank and Global Head of Strategy and M&A;
- Mr. Garg joined Citi in May 1988 and assumed his current position in February 2021. Previously, he was global CEO of the Commercial Bank beginning in 2011. Prior to that, Mr. Garg led the U.S. Commercial Banking business from 2008 until 2011. In addition, he held various other roles at Citi in Operations and Technology, Treasury and Trade Solutions, Corporate and Investment Banking and Commercial Banking.
- Mr. Livingstone joined Citi in 2016 and assumed his current position in March 2019. Previously, he served as Citi Country Officer for Australia and New Zealand since June 2016. Prior to joining Citi, he had a nine-year career at Credit Suisse, where he was Vice Chairman of the Investment Banking and Capital Markets Division for the EMEA region, Head of M&A and CEO of Credit Suisse Australia;
- Mr. Mason joined Citi in 2001 and assumed his current position in February 2019. Previously, he served as CFO of *ICG* since September 2014. He held a number of other senior operational, strategic and financial executive roles across the organization, including CEO of Citi Private Bank, CEO of Citi Holdings and CFO and Head of Strategy and M&A for Citi's Global Wealth Management Division;
- Mr. McIntosh joined Citi in his current position in October 2021. Previously, he served as Under Secretary for International Affairs at the U.S. Treasury from 2019 to 2021. From 2017 to 2019, Mr. McIntosh served as U.S. Treasury's General Counsel. Prior to that, he was a partner in the law firm of Sullivan & Cromwell and served in the U.S. White House from 2006 until 2009;
- Mr. Okpara joined Citi in his current position in November 2020. Previously he served as Managing Director, Global Head of Financial Planning and Analysis and CFO, Infrastructure Groups at Morgan Stanley since 2016. Prior to that, Mr. Okpara was Managing Vice President, Finance and Deputy Controller at Capital One Financial Corporation;
- Ms. Peetz joined Citi in her current position in June 2020. Previously, she served on the Board of Directors of Wells Fargo from 2017 to 2019. Ms. Peetz spent nearly 20 years at BNY Mellon, where she managed several business units and ultimately served as President for five years until her departure in 2016. Prior to that, she worked at JPMorgan Chase, where she held a variety of management positions during her tenure;
- Mr. Selvakesari joined Citi in 1991 and assumed his current position in January 2021. Previously, he served as Head of the U.S. Consumer Bank since October 2018 and held various other roles at Citi prior to that, including Head of Consumer Banking for Asia Pacific from 2015 to 2018, as well as a number of regional and country roles, including Head of Consumer Banking for ASEAN and India, leading the consumer banking businesses in Singapore, Malaysia, Indonesia, the Philippines, Thailand and Vietnam, as well as India;
- Mr. Torres Cantú joined Citi in 1989 and assumed his current position in October 2019. Previously, he served as CEO of Citibanamex since October 2014. He served as CEO of (the former) *Global Consumer Banking* in

Mexico from 2006 to 2011 and CEO of Crédito Familiar from 2003 to 2006. In addition, he previously held roles in Citibanamex, including Regional Director and Divisional Director;

- Mr. Turek joined Citi in 1991 and assumed his current position in December 2020. Previously, he served as CRO for EMEA since February 2020 and held various other roles at Citi, including CEO of Citibank Europe as well as leading significant franchises across Citi, including in Russia, South Africa and Hungary;
- Ms. Wechter joined Citi in 2004 and assumed her current position in July 2018. Previously, she served as Citi's Head of Talent and Diversity as well as Chief of Staff to Citi CEO Michael Corbat. She served as Chief of Staff to both Michael O'Neill and Richard Parsons during their terms as Chairman of Citigroup's Board of Directors. In addition, she held roles in Citi's *ICG*, including Corporate M&A and Strategy and Investment Banking;
- Mr. Whitaker joined Citi in 2009 and assumed his current position in November 2018. Previously, he served as Head of Operations & Technology for *ICG* since September 2014 and held various other roles at Citi, including Head of Securities & Banking Operations & Technology, Head of *ICG* Technology and Regional Chief Information Officer; and
- Mr. Ybarra joined Citi in 1987 and assumed his current position in May 2019. Previously, he served as *ICG*'s Global Head of Markets and Securities Services since November 2013. In addition, he has held a number of other roles across *ICG*, including Deputy Head of *ICG*, Global Head of Markets and Co-Head of Global Fixed Income.

Code of Conduct, Code of Ethics

Citi has a Code of Conduct that maintains its commitment to the highest standards of conduct. The Code of Conduct is supplemented by a Code of Ethics for Financial Professionals (including accounting, controllers, financial reporting operations, financial planning and analysis, treasury, capital planning, tax, productivity and strategy, M&A, investor relations and regional/product finance professionals and administrative staff) that applies worldwide. The Code of Ethics for Financial Professionals applies to Citi's principal executive officer, principal financial officer and principal accounting officer. Amendments and waivers, if any, to the Code of Ethics for Financial Professionals will be disclosed on Citi's website, www.citigroup.com. The Audit Committee has responsibility for the oversight of Citi's Code of Ethics for Financial Professionals.

Both the Code of Conduct and the Code of Ethics for Financial Professionals can be found on the Citi website by clicking on "Investors" and then "Corporate Governance." Citi's Corporate Governance Guidelines can also be found there, as well as the charters for the Audit Committee, the Compensation, Performance and Culture Committee, the Nomination, Governance and Public Affairs Committee, the Risk Management Committee and the Technology Committee of Citigroup's Board of Directors. These materials are also available by writing to Citigroup Inc., Corporate Governance, 388 Greenwich Street, 17th Floor, New York, New York 10013.

CITIGROUP BOARD OF DIRECTORS

Ellen M. Costello
Former President and CEO
BMO Financial Corporation and
Former U.S. Country Head
BMO Financial Group

Grace E. Dailey
Former Senior Deputy Comptroller
for Bank Supervision Policy and
Chief National Bank Examiner
Office of the Comptroller of the
Currency (OCC)

Barbara J. Desoer
Chair
Citibank, N.A.

John C. Dugan
Chair
Citigroup Inc.

Jane Fraser
Chief Executive Officer
Citigroup Inc.

Duncan P. Hennes
Co-Founder and Partner
Atrevida Partners, LLC

Peter Blair Henry
Class of 1984 Senior Fellow, Hoover
Institution, and Senior Fellow,
Freeman Spogli Institute for
International Studies, Stanford
University

S. Leslie Ireland
Former Assistant Secretary for
Intelligence and Analysis
U.S. Department of the Treasury,
and National Intelligence Manager
for Threat Finance, Office of the
Director of National Intelligence

Renée J. James
Founder, Chair and CEO
Ampere Computing

Gary M. Reiner
Operating Partner
General Atlantic LLC

Diana L. Taylor
Former Superintendent of Banks
State of New York

James S. Turley
Former Chairman and CEO
Ernst & Young

Casper W. von Koskull
Former President and Group Chief
Executive Officer
Nordea Bank Abp

Signatures

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized, on the 24th day of February, 2023.

Citigroup Inc.
(Registrant)

/s/ Mark A. L. Mason

Mark A. L. Mason
Chief Financial Officer

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities indicated on the 24th day of February, 2023.

Citigroup's Principal Executive Officer and a Director:

/s/ Jane Fraser

Jane Fraser

Citigroup's Principal Financial Officer:

/s/ Mark A. L. Mason

Mark A. L. Mason

Citigroup's Principal Accounting Officer:

/s/ Johnbull E. Okpara

Johnbull E. Okpara

The Directors of Citigroup listed below executed a power of attorney appointing Mark A. L. Mason their attorney-in-fact, empowering him to sign this report on their behalf.

Ellen M. Costello	S. Leslie Ireland
Grace E. Dailey	Renée J. James
Barbara Desoer	Gary M. Reiner
John C. Dugan	Diana L. Taylor
Duncan P. Hennes	James S. Turley
Peter Blair Henry	Casper W. von Koskull

/s/ Mark A. L. Mason

Mark A. L. Mason

GLOSSARY OF TERMS AND ACRONYMS

The following is a list of terms and acronyms that are used in this report and other Citigroup presentations.

* Denotes a Citi metric

2022 Annual Report on Form 10-K: Annual report on Form 10-K for year ended December 31, 2022, filed with the SEC.

90+ days past due delinquency rate*: Represents consumer loans that are past due by 90 or more days, divided by that period's total EOP loans.

ABS: Asset-backed securities

ACL: Allowance for credit losses, which is composed of the allowance for credit losses on loans (ACLL) and allowance for credit losses on unfunded lending commitments (ACLUC), allowance for credit losses on HTM securities and allowance for credit losses on other assets.

ACLL: Allowance for credit losses on loans

ACLUC: Allowance for credit losses on unfunded lending commitments

Advanced Approaches: The Advanced Approaches capital framework, established through Basel III rules by the FRB, requires certain banking organizations to use an internal ratings-based approach and other methodologies to calculate risk-based capital requirements for credit risk and advanced measurement approaches to calculate risk-based capital requirements for operational risk.

AFS: Available-for-sale

ALCO: Asset Liability Committee

Amortized cost: Amount at which a financing receivable or investment is originated or acquired, adjusted for accretion or amortization of premium, discount, and net deferred fees or costs, collection of cash, charge-offs, foreign exchange, and fair value hedge accounting adjustments. For AFS securities, amortized cost is also reduced by any impairment losses recognized in earnings. Amortized cost is not reduced by the allowance for credit losses, except where explicitly presented net.

AOCI: Accumulated other comprehensive income (loss)

ARM: Adjustable rate mortgage(s)

ASC: Accounting Standards Codification under GAAP issued by the FASB.

Asia Consumer: Asia Consumer Banking

ASU: Accounting Standards Update under GAAP issued by the FASB.

AUC: Assets under custody

AUM: Assets under management. Represent assets managed on behalf of Citi's clients.

Available liquidity resources*: Resources available at the balance sheet date to support Citi's client and business needs, including HQLA assets; additional unencumbered securities, including excess liquidity held at bank entities that is non-transferable to other entities within Citigroup; and available assets not already accounted for within Citi's HQLA to support Federal Home Loan Bank (FHLB) and Federal Reserve Bank discount window borrowing capacity.

Basel III: Liquidity and capital rules adopted by the FRB based on an internationally agreed set of measures developed by the Basel Committee on Banking Supervision.

Beneficial interests issued by consolidated VIEs: Represents the interest of third-party holders of debt, equity securities or other obligations, issued by VIEs that Citi consolidates.

Benefit obligation: Refers to the projected benefit obligation for pension plans and the accumulated postretirement benefit obligation for OPEB plans.

BHC: Bank holding company

Board: Citigroup's Board of Directors

Book value per share*: EOP common equity divided by EOP common shares outstanding.

Bps: Basis points. One basis point equals 1/100th of one percent.

Branded cards: Citi's branded cards business with a portfolio of proprietary cards (Double Cash, Custom Cash, ThankYou and Value cards) and co-branded cards (including, among others, American Airlines and Costco).

Build: A net increase in ACL through the provision for credit losses.

Cards: Citi's credit cards' businesses or activities.

CCAR: Comprehensive Capital Analysis and Review

CCO: Chief Compliance Officer

CDS: Credit default swaps

CECL: Current expected credit losses

CEO: Chief Executive Officer

CET1 Capital: Common Equity Tier 1 Capital. See "Capital Resources—Components of Citigroup Capital" above for the components of CET1.

CET1 Capital ratio*: Common Equity Tier 1 Capital ratio. A primary regulatory capital ratio representing end-of-period CET1 Capital divided by total risk-weighted assets.

CFO: Chief Financial Officer

CFTC: Commodity Futures Trading Commission

CGMHI: Citigroup Global Markets Holdings Inc.

Citi: Citigroup Inc.

Citibank or CBNA: Citibank, N.A. (National Association)

Classifiably managed: Loans primarily evaluated for credit risk based on internal risk rating classification.

Client assets: Represent assets under management as well as custody, brokerage, administration and deposit accounts.

CLO: Collateralized loan obligations

Coincident NCL coverage ratio: A credit metric, representing the ACLL at period end divided by (the most recent quarter's NCLs divided by 3). This ratio is expressed in months of coverage.

Collateral dependent: A loan is considered collateral dependent when repayment of the loan is expected to be provided substantially through the operation or sale of the collateral when the borrower is experiencing financial difficulty, including when foreclosure is deemed probable based on borrower delinquency.

Commercial cards: Provides a wide range of payment services to corporate and public sector clients worldwide through commercial card products. Services include procurement, corporate travel and entertainment, expense management services, and business-to-business payment solutions.

Consent orders: In October 2020, Citigroup and Citibank entered into consent orders with the Federal Reserve and OCC that require Citigroup and Citibank to make improvements in various aspects of enterprise-wide risk management, compliance, data quality management and governance and internal controls.

CRE: Commercial real estate

Credit card spend volume*: Dollar amount of card customers' purchases, net of returns. Also known as purchase sales.

Credit cycle: A period of time over which credit quality improves, deteriorates and then improves again (or vice versa). The duration of a credit cycle can vary from a couple of years to several years.

Credit derivatives: Financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity), which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller).

Critical Audit Matters: Audit matters communicated by KPMG to Citi's Audit Committee of the Board of Directors, relating to accounts or disclosures that are material to the Consolidated Financial Statements and involved especially challenging, subjective or complex judgments. See "Report of Independent Registered Public Accounting Firm" above.

Criticized: Criticized loans, lending-related commitments and derivative receivables that are classified as special mention, substandard and doubtful categories for regulatory purposes.

CRO: Chief Risk Officer

CTA: Cumulative translation adjustment (also known as currency translation adjustment). A separate component of equity within *AOCI* reported net of tax. For Citi, represents the impact of translating non-USD balance sheet items into USD each period. The CTA amount in EOP *AOCI* is a cumulative balance, net of tax.

CVA: Credit valuation adjustment

Delinquency managed: Loans primarily evaluated for credit risk based on delinquencies, FICO scores and the value of underlying collateral.

Dividend payout ratio*: Represents dividends declared per common share as a percentage of net income per diluted share.

Dodd-Frank Act: Wall Street Reform and Consumer Protection Act

DPD: Days past due

DSA: Deferred stock awards

DTA: Deferred tax asset

DVA: Debt valuation adjustment

EC: European Commission

Efficiency ratio*: A ratio signifying how much of a dollar in expenses (as a percentage) it takes to generate one dollar in revenue. Represents total operating expenses divided by total revenues, net.

EMEA: Europe, Middle East and Africa

EOP: End-of-period

EPS*: Earnings per share

ERISA: Employee Retirement Income Security Act of 1974

ESG: Environmental, Social and Governance

ETR: Effective tax rate

EU: European Union

Fannie Mae: Federal National Mortgage Association

FASB: Financial Accounting Standards Board

FCA: Financial Conduct Authority

FDIC: Federal Deposit Insurance Corporation

Federal Reserve: The Board of the Governors of the Federal Reserve System

FFIEC: Federal Financial Institutions Examination Council

FHA: Federal Housing Administration

FHLB: Federal Home Loan Bank

FICO: Fair Issac Corporation

FICO score: A measure of consumer credit risk provided by credit bureaus, typically produced from statistical models by Fair Isaac Corporation utilizing data collected by the credit bureaus.

FINRA: Financial Industry Regulatory Authority

Firm: Citigroup Inc.

FRB: Federal Reserve Board

FRBNY: Federal Reserve Bank of New York

Freddie Mac: Federal Home Loan Mortgage Corporation

Free standing derivatives: A derivative contract entered into either separate and apart from any of the Company's other financial instruments or equity transactions, or in conjunction with some other transaction and legally detachable and separately exercisable.

FTCs: Foreign tax credit carry-forwards

FTE: Full time employee

FVA: Funding valuation adjustment

FX: Foreign exchange

FX translation: The impact of converting non-U.S.-dollar currencies into U.S. dollars.

G7: Group of Seven nations. Countries in the G7 are Canada, France, Germany, Italy, Japan, the U.K. and the U.S.

GAAP or U.S. GAAP: Generally accepted accounting principles in the United States of America.

Ginnie Mae: Government National Mortgage Association

Global Wealth: Global Wealth Management

GSIB: Global systemically important banks

HELOC: Home equity line of credit

HFI loans: Loans that are held-for-investment (i.e., excludes loans held-for-sale).

HFS: Held-for-sale

HQLA: High-quality liquid assets. Consist of cash and certain high-quality liquid securities as defined in the LCR rule.

HTM: Held-to-maturity

Hyperinflation: Extreme economic inflation with prices rising at a very high rate in a very short time. Under U.S. GAAP, entities operating in a hyperinflationary economy need to change their functional currency to the U.S. dollar. Once an entity switches its functional currency to the U.S. dollar, the CTA balance is frozen.

IBOR: Interbank Offered Rate

ICG: Institutional Clients Group

ICRM: Independent Compliance Risk Management

IPO: Initial public offering

ISDA: International Swaps and Derivatives Association

KM: Key financial and non-financial metric used by management when evaluating consolidated and/or individual business results.

KPMG LLP: Citi's Independent Registered Public Accounting Firm.

LATAM: Latin America, which for Citi, includes Mexico.

LCR: Liquidity coverage ratio. Represents HQLA divided by net outflows in the period.

LDA: Loss Distribution Approach

LF: Legacy Franchises

LGD: Loss given default

LIBOR: London Interbank Offered Rate

LLC: Limited Liability Company

LTD: Long-term debt

LTV: Loan-to-value. For residential real estate loans, the relationship, expressed as a percentage, between the principal amount of a loan and the appraised value of the collateral (i.e., residential real estate) securing the loan.

Master netting agreement: A single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due).

MBS: Mortgage-backed securities

MCA: Manager's control assessment

MD&A: Management's discussion and analysis

Measurement alternative: Measures equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer.

Mexico Consumer: Mexico Consumer Banking

Mexico Consumer/SBMM: Mexico Consumer Banking and Small Business and Middle-Market Banking

Mexico SBMM: Mexico Small Business and Middle-Market Banking

Moody's: Moody's Investor Services

MSRs: Mortgage servicing rights

N/A: Data is not applicable or available for the period presented.

NAA: Non-accrual assets. Consists of non-accrual loans and OREO.

NAL: Non-accrual loans. Loans for which interest income is not recognized on an accrual basis. Loans (other than credit card loans and certain consumer loans insured by U.S. government-sponsored agencies) are placed on non-accrual status when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest have been in default for a period of 90 days or more unless the loan is both well secured and in the process of collection. Collateral-dependent loans are typically maintained on non-accrual status.

NAV: Net asset value

NCL(s): Net credit losses. Represents gross credit losses, less gross credit recoveries.

NCL ratio*: Represents net credit losses (recoveries) (annualized), divided by average loans for the reporting period.

Net capital rule: Rule 15c3-1 under the Securities Exchange Act of 1934.

Net interchange income: Includes the following components:

- Interchange revenue: Fees earned from merchants based on Citi's credit and debit card customers' sales transactions.
- Reward costs: The cost to Citi for points earned by cardholders enrolled in credit card rewards programs generally tied to sales transactions.
- Partner payments: Payments to co-brand credit card partners based on the cost of loyalty program rewards earned by cardholders on credit card transactions.

NII: Net interest income. Represents total interest revenue less total interest expenses.

NIM*: Net interest margin expressed as a yield percentage, calculated as annualized net interest income divided by average interest-earning assets for the period.

NIR: Non-interest revenues

NM: Not meaningful

Noncontrolling interests: The portion of an investment that has been consolidated by Citi that is not 100% owned by Citi.

Non-GAAP financial measure: Management uses these financial measures because it believes they provide information to enable investors to understand the underlying operational performance and trends of Citi and its businesses.

NSFR: Net stable funding ratio

O/S: Outstanding

OCC: Office of the Comptroller of the Currency

OCI: Other comprehensive income (loss)

OREO: Other real estate owned

OTTI: Other-than-temporary impairment

Over-the-counter cleared (OTC-cleared) derivatives: Derivative contracts that are negotiated and executed bilaterally, but subsequently settled via a central clearing house, such that each derivative counterparty is only exposed to the default of that clearing house.

Over-the-counter (OTC) derivatives: Derivative contracts that are negotiated, executed and settled bilaterally between two derivative counterparties, where one or both counterparties is a derivatives dealer.

Parent company: Citigroup Inc.

Participating securities: Represents unvested share-based compensation awards containing nonforfeitable rights to dividends or dividend equivalents (collectively, "dividends"), which are included in the earnings per share calculation using the two-class method. Citi grants RSUs to certain employees under its share-based compensation programs, which entitle the recipients to receive non-forfeitable dividends during the vesting period on a basis equivalent to the dividends paid to holders of common stock. These unvested awards meet the definition of participating securities. Under the two-class method for calculating EPS, all earnings (distributed and undistributed) are allocated to each class of common stock and participating securities, based on their respective rights to receive dividends.

PBWM: Personal Banking and Wealth Management

PCD: Purchased credit-deteriorated assets are financial assets that as of the date of acquisition have experienced a more-than-insignificant deterioration in credit quality since origination, as determined by the Company.

PCI: Purchased credit-impaired loans represented certain loans that were acquired and deemed to be credit impaired on the acquisition date. The now superseded FASB guidance that allowed purchasers to aggregate credit-impaired loans acquired in the same fiscal quarter into one or more pools, provided that the loans had common risk characteristics (e.g., product type, LTV ratios).

PD: Probability of default

Principal transactions revenue: Primarily trading-related revenues predominantly generated by the *ICG* businesses. See Note 6.

Provision for credit losses: Composed of the provision for credit losses on loans, provision for credit losses on HTM investments, provision for credit losses on other assets and provision for credit losses on unfunded lending commitments.

Provisions: Provisions for credit losses and for benefits and claims.

PSUs: Performance share units

R&S forecast period: Reasonable and supportable period over which Citi forecasts future macroeconomic conditions for CECL purposes.

Real GDP: Real gross domestic product is the inflation-adjusted value of the goods and services produced by labor and property located in a country.

Regulatory VAR: Daily aggregated VAR calculated in accordance with regulatory rules.

REITs: Real estate investment trusts

Release: A net decrease in ACL through the provision for credit losses.

Reported basis: Financial statements prepared under U.S. GAAP.

Results of operations that exclude certain impacts from gains or losses on sale, or one-time charges*: Represents GAAP items, excluding the impact of gains or losses on sales, or one-time charges (e.g., the loss on sale related to the sale of Citi's consumer banking business in Australia).

Results of operations that exclude the impact of FX translation*: Represents GAAP items, excluding the impact of FX translation, whereby the prior periods' foreign currency balances are translated into U.S. dollars at the current periods' conversion rates (also known as constant dollar).

Retail services: Citi's U.S. retail services cards business with a portfolio of co-brand and private label relationships (including, among others, The Home Depot, Sears, Best Buy and Macy's).

RMI: A non-partisan, non-profit organization that works to transform global energy systems across the real economy. Citi joined the RMI Center for Climate-Aligned Finance in 2021.

ROA*: Return on assets. Represents net income (annualized), divided by average assets for the period.

ROCE*: Return on Common Equity. Represents net income less preferred dividends (both annualized), divided by average common equity for the period.

ROE: Return on equity. Represents net income less preferred dividends (both annualized), divided by average Citigroup equity for the period.

RoTCE*: Return on tangible common equity. Represents net income less preferred dividends (both annualized), divided by average tangible common equity for the period.

RSU(s): Restricted stock units

RWA: Risk-weighted assets. Basel III establishes two comprehensive approaches for calculating RWA (the Standardized Approach and the Advanced Approaches), which include capital requirements for credit risk, market risk, and operational risk for Advanced Approaches. Key differences in the calculation of credit risk RWA between the Standardized and Advanced Approaches are that for Advanced, credit risk RWA is based on risk-sensitive approaches that largely rely on the use of internal credit models and parameters, whereas for Standardized, credit risk RWA is generally based on supervisory risk-weightings, which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized Approach and Basel III Advanced Approaches.

S&P: Standard and Poor's Global Ratings

SCB: Stress Capital Buffer

SCF: Subscription credit facility. SCFs are revolving credit facilities provided to private equity funds that are secured against the fund's investors' capital commitments.

SEC: The U.S. Securities and Exchange Commission

Securities financing agreements: Include resale, repurchase, securities borrowed and securities loaned agreements.

SLR: Supplementary Leverage ratio. Represents Tier 1 Capital divided by total leverage exposure.

SOFR: Secured Overnight Financing Rate

SPEs: Special purpose entities

Standardized Approach: Established through Basel III, the Standardized Approach aligns regulatory capital requirements more closely with the key elements of banking risk by introducing a wider differentiation of risk weights and a wider recognition of credit risk mitigation techniques, while avoiding excessive complexity. Accordingly, the Standardized Approach produces capital ratios more in line with the actual economic risks that banks are facing.

Structured notes: Financial instruments whose cash flows are linked to the movement in one or more indexes, interest rates, foreign exchange rates, commodities prices, prepayment rates or other market variables. The notes typically contain embedded (but not separable or detachable) derivatives. Contractual cash flows for principal, interest or both can vary in amount and timing throughout the life of the note based on non-traditional indexes or non-traditional uses of traditional interest rates or indexes.

Tangible book value per share (TBVPS)*: Represents tangible common equity divided by EOP common shares outstanding.

Tangible common equity (TCE): Represents common stockholders' equity less goodwill and identifiable intangible assets, other than MSRs.

Taxable-equivalent basis: Represents the total revenue, net of interest expense for the business, adjusted for revenue from investments that receive tax credits and the impact of tax-exempt securities. This metric presents results on a level comparable to taxable investments and securities.

TDR: Troubled debt restructuring. TDR is deemed to occur when the Company modifies the original terms of a loan agreement by granting a concession to a borrower that is experiencing financial difficulty. Loans with short-term and other insignificant modifications that are not considered concessions are not TDRs.

TLAC: Total loss-absorbing capacity

Total ACL: Allowance for credit losses, which comprises the allowance for credit losses on loans (ACLL), allowance for credit losses on unfunded lending commitments (ACLUC), allowance for credit losses on HTM securities and allowance for credit losses on other assets.

Total payout ratio*: Represents total common dividends declared plus common share repurchases as a percentage of net income available to common shareholders.

Transformation: Citi has embarked on a multiyear transformation, with the target outcome to change Citi's business and operating models such that they simultaneously strengthen risk and controls and improve Citi's value to customers, clients and shareholders.

Unaudited: Financial statements and information that have not been subjected to auditing procedures sufficient to permit an independent certified public accountant to express an opinion.

U.S. government agencies: U.S. government agencies include, but are not limited to, agencies such as Ginnie Mae and FHA, and do not include Fannie Mae and Freddie Mac, which are U.S. government-sponsored enterprises (U.S. GSEs). In general, obligations of U.S. government agencies are fully and explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government in the event of a default.

U.S. Treasury: U.S. Department of the Treasury

VAR: Value at risk. A measure of the dollar amount of potential loss from adverse market moves in an ordinary market environment.

VIEs: Variable interest entities

Wallet: Proportion of fee revenue based on estimates of investment banking fees generated across the industry (i.e., the revenue wallet) from investment banking transactions in M&A, equity and debt underwriting, and loan syndications.

Stockholder information

Citigroup common stock is listed on the NYSE under the ticker symbol "C." Citigroup preferred stock Series J and K are also listed on the NYSE.

Because Citigroup's common stock is listed on the NYSE, the Chief Executive Officer is required to make an annual certification to the NYSE stating that she was not aware of any violation by Citigroup of the corporate governance listing standards of the NYSE. The annual certification to that effect was made to the NYSE on May 5, 2022.

As of January 31, 2023, Citigroup had approximately 60,813 common stockholders of record. This figure does not represent the actual number of beneficial owners of common stock because shares are frequently held in "street name" by securities dealers and others for the benefit of individual owners who may vote the shares.

Transfer agent

Stockholder address changes and inquiries regarding stock transfers, dividend replacement, 1099-DIV reporting and lost securities for common and preferred stock should be directed to:

Computershare
P.O. Box 43078
Providence, RI 02940-3078
Telephone No. 781 575 4555
Toll-free No. 888 250 3985
E-mail address: shareholder@computershare.com
Web address: www.computershare.com/investor

Exchange agent

Holders of Golden State Bancorp, Associates First Capital Corporation or Citicorp common stock should arrange to exchange their certificates by contacting:

Computershare
P.O. Box 43014
Providence, RI 02940-3014
Telephone No. 781 575 4555
Toll-free No. 888 250 3985
E-mail address: shareholder@computershare.com
Web address: www.computershare.com/investor

On May 9, 2011, Citi effected a 1-for-10 reverse stock split. All Citi common stock certificates issued prior to that date must be exchanged for new certificates by contacting Computershare at the address noted above.

Citi's 2022 Form 10-K filed with the SEC, as well as other annual and quarterly reports, are available from Citi Document Services toll free at 877 936 2737 (outside the United States at 716 730 8055), by e-mailing a request to docserve@citi.com or by writing to:

Citi Document Services
540 Crosspoint Parkway
Getzville, NY 14068

Stockholder inquiries

Information about Citi, including quarterly earnings releases and filings with the U.S. Securities and Exchange Commission, can be accessed via Citi's website at www.citigroup.com. Stockholder inquiries can also be directed by e-mail to shareholderrelations@citi.com.

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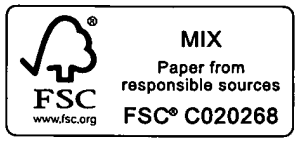

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