Risk Management

Risks are an inherent part of our business operations and managing them is crucial for our long-term growth and sustainability. Our primary objective is to manage our businesses and their associated risks in a way that provides enduring value for our customers, shareholders, employees and communities.

The Group has a comprehensive and integrated risk management approach that covers all types of risks, underpinned by a strong corporate culture. This approach is embodied in our risk management framework, which incorporates our risk appetite and governance and covers the key principles, policies, and practices we use to manage both financial and non-financial risks.

Principal risk types are managed with the requisite competencies and resources, detailed guidelines and procedures, infrastructure and systems that commensurate with our defined risk-taking parameters. We pay close attention to identifying, measuring, setting tolerances and monitoring, reporting and dynamically reviewing the risks we accept. Established escalation processes are in place to ensure that risks are discussed and sanctioned at the appropriate levels. Our risk management frameworks and approaches are periodically reviewed and enhanced to incorporate best-in-class practices.

Our policies and procedures comply with the prevailing regulatory standards applicable in the jurisdictions where we operate. Banking subsidiaries adopt the Group risk management framework and policies to comply with the Group's risk standards and/or local regulatory requirements, whichever is stricter. Approving authority and limit structures, designed to ensure proper ownership and accountability, are also consistent with that of the Group.

Great Eastern Holdings (GEH) and OCBC Indonesia are listed companies. Their annual reports contain information on their risk management frameworks and practices. Their risk management frameworks, policies and practices are appropriately aligned with the Group's risk standards.

Risks are increasingly inter-connected and have to be assessed holistically. To this end, we have also established cross functional assessments of risk via emerging risk discussions, and a suite of stress-testing and scenario analyses that inform what the impact of plausible risk factors could be to our earnings, capital, liquidity, customer segments, and obligations. Such impacts are taken into account in shaping our risk strategies and contingency plans.

Additionally, we continue to invest in risk infrastructure, digital technologies and data analytics to enhance our risk management capabilities. This includes the selected adoption of artificial intelligence (AI) techniques in early warning and risk assessments which enable us to make more informed decisions and develop proactive strategies to mitigate potential risks.

Principal Risk Types

We generally categorise the risks we face into five principal risk types, as follows:

Table 1: Principal Risk Types

Principal Risks	Definition
Credit Risk	Credit risk is the risk of losing principal and/or income from the failure of an obligor or counterparty to meet its financial or contractual obligations due to an adverse change in the credit profile of an obligor or counterparty.
Market Risk	Market risk is the risk of income and/or market value loss due to fluctuations in factors such as interest rates, foreign exchange rates, credit spreads and, equity and commodity prices or their volatilities and correlations arising from both trading and/or banking activities.
Liquidity Risk	Liquidity risk is the risk arising from an inability to meet financial and cash outflow obligations as they fall due.
Operational Risk	Operational risk is the risk of loss caused by failures in internal processes, and systems or due to poor management, human error or external events. It covers various non-financial risks including fraud; money laundering, terrorism financing and sanctions risk; new product risk; third-party risk; physical and people security risk; conduct risk; business continuity risk; unauthorised trading risk and regulatory, legal and reputational risk.
Information Security and Digital Risk	Information security risk is the risk of compromising confidentiality, integrity and/or availability of information (in physical or digital form). Digital risk includes cyber and technology risks. Cyber risk is the risk arising from malicious acts perpetrated by threat actors. Technology risk is the risk of disruption, failure or irregularity in essential financial services due to the use of information and communication technologies.

Please refer to the respective sections for details of our risk management approach for each of the principal risk types.

Environmental, Social and Governance (ESG) and Climate Risks

We take an integrated and risk-based approach to addressing the financial and reputational implications with respect to ESG and climate risks. This entails ensuring that risk drivers that impact the Group across credit, market, liquidity, operational and reputational risks are adequately identified, assessed and managed in accordance with our existing risk management approaches and planning horizons. In addition to embedding ESG and climate risk management in the responsibilities of the relevant principal risk management committees, our risk appetite framework takes into account the management of the reputational and financial impact of sustainability issues.

Currently, ESG and climate considerations impinge more significantly on credit and reputational risks primarily relating to our wholesale lending activities. Hence, we have incorporated such considerations in our Responsible Financing framework and policies and our credit approval processes for such activities. We continue to enhance our assessment and management of our portfolio through ESG and climate risk metrics, policies and reports, along with climate scenario analysis and stress testing. We also engage clients in certain sectors to evaluate their ability to manage ESG, transition and physical risks. High-risk clients undergo enhanced due diligence as well as further reviews and approvals. These include escalation of transactions with significant reputational risks to the Reputational Risk Review Group, while time-bound action plans or legal covenants may be required. We will continue to progressively adopt quantitative ESG and climate risk metrics and enhance our climate risk scenario analysis methodologies taking into account industry developments, availability of data and regular dialogue with regulators.

Please refer to our Sustainability Report 2023 on Climate Action and Responsible Financing for more information on our ESG and climate risk management efforts.

Risk Governance and Organisation

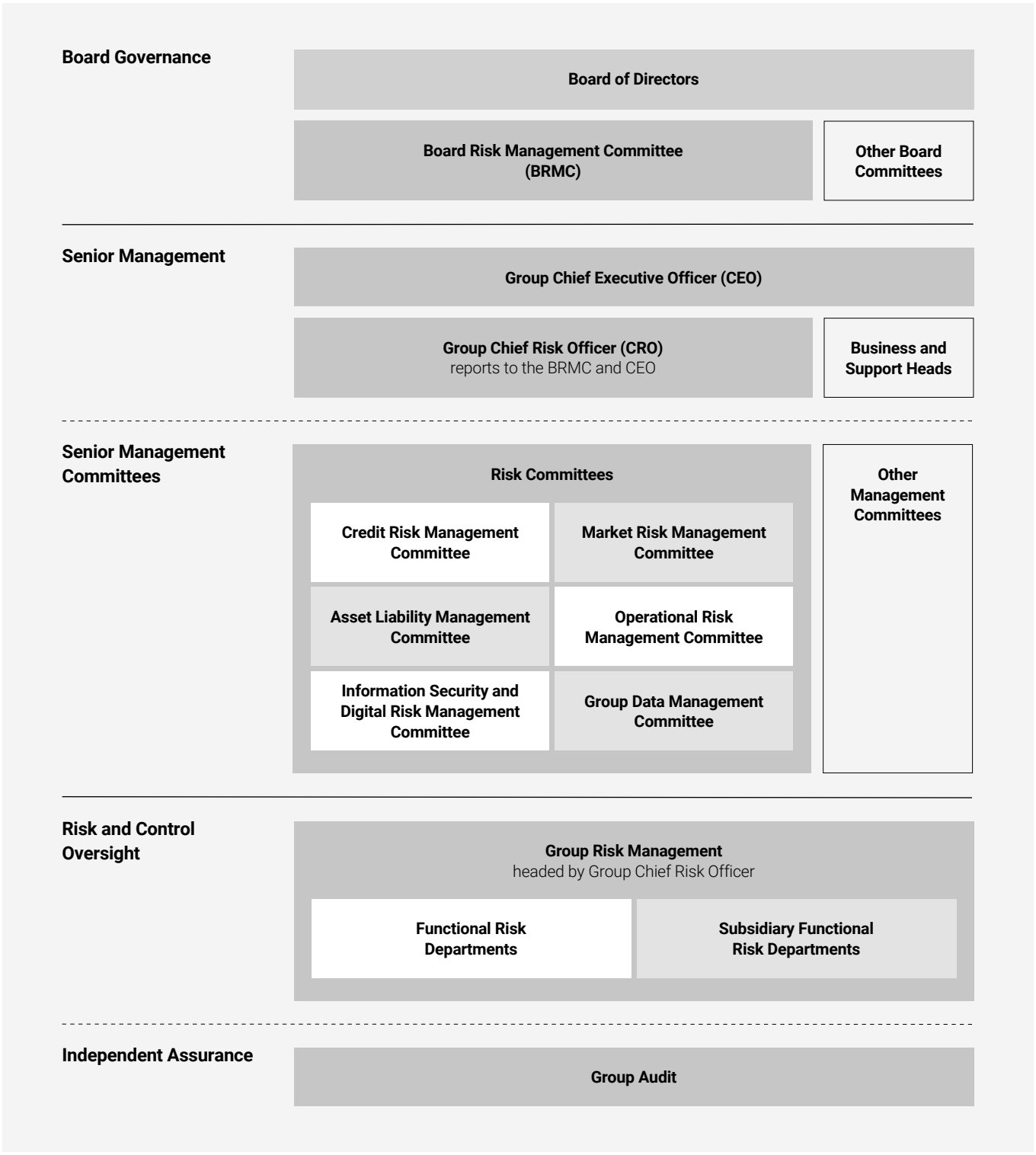
A robust risk governance structure ensures effective oversight and accountability of risk. This enables smooth reporting and escalation of risks to the Board of Directors who have ultimate responsibility for the effective management of risk. The Board establishes the corporate strategy and approves the risk appetite within which senior management executes the strategy. The Group's risk governance and oversight structure, which banking subsidiaries and GEH are aligned with, is shown on page 77.

The Board Risk Management Committee (BRMC) is the designated board committee overseeing risk management matters. It ensures that the Group's overall risk management philosophy and principles and risk appetite are aligned with the corporate strategy. The BRMC has oversight of credit, market, liquidity, information security and digital, operational, conduct, money laundering and terrorism financing, legal, regulatory, strategic, ESG and fiduciary risks, as well as any other category of risk that may be delegated by the Board or deemed necessary by the Committee. The BRMC ensures that the overall risk management organisation is in place and effective.

The BRMC provides quantitative and qualitative guidance to major business units and risk functions to guide risk-taking. Senior management, functional risk committees and the BRMC regularly review our risk drivers, risk profiles, risk management frameworks and policies, and compliance matters. Please refer to the Corporate Governance Chapter for more information on the BRMC.

Dedicated functional risk committees to manage the principal risk types have been established to facilitate the BRMC's risk oversight. These committees are supported by the functional risk management units under the Group Risk Management Division (GRM).

GRM is headed by the Group Chief Risk Officer (CRO). The Group CRO is a member of the Group Management Executive Committee and functional risk committees. GRM's day-to-day responsibilities involve providing independent risk control and managing credit, market, liquidity, information security and digital, operational and ESG risks. It provides regular risk reports and updates on developments in material risk drivers and potential vulnerabilities. It recommends mitigating actions to senior management, risk committees, the BRMC and Board. At the Group level, GRM also provides functional oversight to the banking subsidiaries and GEH.


Board Governance
Board of Directors
Board Risk Management Committee (BRMC)
Other Board Committees
Senior Management
Group Chief Executive Officer (CEO)
Group Chief Risk Officer (CRO)
reports to the BRMC and CEO
Business and Support Heads
Senior Management Committees
Risk Committees
Credit Risk Management Committee
Market Risk Management Committee
Asset Liability Management Committee
Operational Risk Management Committee
Information Security and Digital Risk Management Committee
Group Data Management Committee
Other Management Committees
Risk and Control Oversight
Group Risk Management
headed by Group Chief Risk Officer
Functional Risk Departments
Subsidiary Functional Risk Departments
Independent Assurance
Group Audit

Three Lines of Defence

All employees are responsible for identifying and managing risk, a responsibility embedded in our corporate culture and robust internal control environment. This is operationalised via a three-line defence structure that distinctly outlines the roles, responsibilities and accountability of risk.

Table 2: Three Lines of Defence

First Line	Second Line	Third Line
Day-to-day Risk Management	**Risk and Control Oversight**	**Independent Assurance**
Business and Support Units: • Owns and manages risks arising from their business activities on a day-to-day basis. • Carries out business activities that are consistent with the Group's strategy and risk appetite. • Operates within the approved boundaries of our policies and limits and comply with applicable laws and regulations.	**Risk and Control Function:** • Independently and objectively identifies and assesses the risk-taking activities of the first line. • Establishes relevant risk management frameworks, policies, processes and systems. • Provides independent identification, assessment, monitoring and reporting of the Group's risk profiles, portfolio concentrations and material risk issues.	**Group Audit:** • Independently provides assurance to the Group CEO, Audit Committee and Board on the adequacy and effectiveness of our risk management and internal control systems. • Evaluates the overall risk awareness and control consciousness of management in discharging its supervisory and oversight responsibilities.

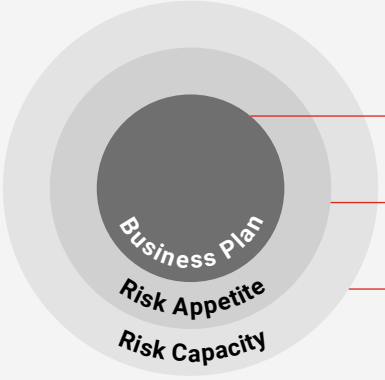
Risk Appetite

Our aim is to manage risks in a prudent and sustainable manner for the long-term viability of the Group. The Board determines the Group's risk appetite, defining the level and nature of risks that we can undertake on behalf of our shareholders while maintaining our commitments to customers, regulators, employees and other stakeholders. Business plans take into account the corporate strategy, the forward-looking operating environment and potential risks assessed against our risk appetite.

Our risk appetite is operationalised across the Group through our policies, processes and limits to manage both financial and non-financial risks.

Senior business and risk managers participate in regular forums to review macroeconomic and financial developments and discuss operating conditions, event risks and potential 'dark clouds' that may significantly impact on our earnings or solvency. These risks are measured via stress tests as well as segment-specific and ad hoc event-specific portfolio reviews. The results are used to assess the potential impact of various scenarios on our earnings and capital, and to identify vulnerabilities of material portfolios and trigger appropriate risk management actions.

We conduct an annual Internal Capital Adequacy Assessment Process (ICAAP) that incorporates the results of stress tests for various risk types. The aim is to assess if we can maintain sufficient capital levels under a forward-looking operating environment and in severe stress scenarios. Appropriate risk-mitigating actions are taken to manage potential risks.



Business Plan	Demand for Risk and Financial Resources to meet our business objectives
Risk Appetite	Level and nature of risk deemed acceptable while ensuring a sufficient buffer in the Risk and Financial Resources
Risk Capacity	Supply of Risk and Financial Resources such as Funding and Capital

Credit Risk Management

Credit risk arises from our lending activities to retail, corporate and institutional customers. It also includes counterparty and issuer credit risks arising from our underwriting, trading and investment banking activities.

Credit Risk Management Approach

Our credit risk management framework provides a comprehensive and proactive approach towards managing credit risk in the Group. The framework documents the credit risk objectives and minimum standards for the full credit risk management cycles of the Group's lending businesses. Effective risk management is enhanced by the experience and sound judgment of our credit specialists.

Our credit risk management approach is tailored based on the unique characteristics and nature of the various portfolios or customer segments. Specific policies and procedures are in place for major customer segments. Please refer to Table 3 for more information.

Counterparty Credit Risk Management

Counterparty credit risk emerges from the potential default of a counterparty during our trading and/or banking activities in derivatives and debt securities. The credit exposure to a counterparty is measured as the sum of current mark-to-market value of the transactions plus an appropriate add-on for potential future exposures due to market price fluctuations. This risk also covers settlement risk, which is the potential loss incurred if a counterparty fails to fulfil its obligation after the Bank has performed its obligation under a contract or agreement at the settlement date.

We actively manage counterparty credit risk through a dedicated risk management team. The team assesses risk at the individual counterparty level, country and sector portfolio level, and product level following a set of policies and procedures. Each counterparty undergoes robust credit assessment, including the suitability of the product offered. Credit risk mitigation tools are used as needed to manage counterparty credit risk. Please refer to the Credit Risk Mitigation section on page 81 for details.

We independently manage our credit exposures through daily limit monitoring, escalation of excesses, pre-deal excess approvals, regular risk reporting and stress testing. In addition, we have an established policy and process to identify, manage and report wrong-way risk, which arises when the quantum of exposure to a counterparty increases as the counterparty's credit quality deteriorates.

Table 3: Credit Risk Management Approach for Major Customer Segments

Consumers and Small Businesses	• Assess credits through credit programmes with predefined acquisition strategies, product structures and portfolio and transaction limits, as well as customer selection, lending and collateral criteria. • Use advanced application models and systems for efficient, objective and consistent credit decision making and customer due diligence checks. • Apply bankruptcy and credit bureau checks, together with systems and processes such as identity checks and independent verification of documentation for credit screening and fraud detection purposes. • Use comprehensive risk management information systems (MIS), behavioural models and stress testing for monitoring and early identification of potentially weak credits. • Monitor credit risk on a portfolio basis.
Corporate and Institutional Customers	• Assess credits individually with robust independent evaluation carried out by experienced credit officers. • Use predefined target market and risk acceptance criteria to guide credit extensions. • Make credit decisions after comprehensive qualitative and quantitative risk assessment, including a thorough understanding of the customer and customer group's interdependencies. • Business and credit risk units jointly approve credits to ensure objectivity and shared risk ownership. • Conduct regular reviews and forward-looking stress tests at borrower and portfolio levels to monitor credit quality and identify potential weak credits early.
Private Banking Customers	• Assess credits individually with robust independent evaluation carried out by experienced credit officers. • Use predefined risk acceptance criteria, availability of acceptable collateral and stipulated loan advance ratio and margin requirements to guide credit extensions. • Business and credit risk units jointly approve credits to ensure objectivity and shared risk ownership. • Take prompt remedial actions through timely and disciplined resolution of margin calls, top-up provisions, and execution of stop-loss and force-selling of collateral.

Credit Portfolio Management

Credit portfolio management focuses on managing the collective or aggregate risk of our credit portfolios, instead of the credit risk of individual borrowers. We have developed and implemented a range of capabilities to identify, measure and monitor credit risk at the portfolio level. These capabilities include:

- **Portfolio Segmentation**: This is the process of grouping credit exposures that are similar in nature. It involves using attributes that represent common business drivers, such as geography, industry and business segment, as well as common risk drivers such as exposure to material downside risks like a property price correction, a sharp hike in interest rates, or a country risk event.
- **Portfolio Modelling**: This includes using internal rating models to quantify the exposure risk, default risk and potential losses of our borrowers. Please refer to Table 4 for information on our internal rating models. We also use stress test models to simulate the potential increase in our credit losses and Credit Risk Weighted Assets (CRWA) under stressed scenarios.

Overview of Internal Rating Models

Internal credit rating models and their components such as probability of default (PD), loss given default (LGD) and exposure at default (EAD) are used in limit setting, credit approval, portfolio monitoring and reporting, remedial management, stress testing and assessment of capital adequacy and portfolio allowances.

Our model risk management framework governs the development, validation, application and maintenance of rating models. Models are developed with the active participation of credit experts from risk taking and risk control units. They are subject to independent validation before implementation and annually after that to ensure that performance standards, which take into consideration regulatory requirements and industry best practices, are continually met. In addition, Group Audit reviews the robustness of the rating process and the effectiveness of the independent validation process annually. Approval for the adoption and continued use of material models rests with the BRMC. In addition, models that are used in the regulatory capital assessment must be approved by the regulators.

While our internal risk grades are not explicitly mapped to external credit ratings, they may correlate with external credit ratings in terms of the PD ranges because the factors used to rate obligors are similar. As such, an obligor rated poorly by an external credit

Table 4: Key Components of Internal Ratings Based (IRB) Models

IRB Models and Portfolios	PD	LGD and EAD
A-IRB approach covers major retail portfolios such as residential mortgages, credit cards, auto loans, insurance financing, small businesses and margin lending	• PD is estimated based on the application and behaviour scores of obligors. • PD models are calibrated to reflect the expected long-run average one-year default rate over an economic cycle.	• Product, collateral and geographical characteristics are major factors. • LGD models are calibrated to reflect the economic loss under downturn conditions. • EAD models are calibrated to reflect the default-weighted average and economic downturn conditions.
F-IRB (Non-Supervisory Slotting) approach covers major wholesale portfolios such as sovereigns, banks, non-bank financial institutions, corporate real estate (including income producing real estate) and general corporates	• PD models are statistical based or expert judgement models that use both quantitative and qualitative factors to assess an obligor's repayment capacity and calibrated to reflect the expected long-run average one-year default rate over an economic cycle. • Expert judgement models based on inputs from internal credit experts are typically used for portfolios with low default rates.	• LGD and EAD are estimated based on rules prescribed in MAS Notice 637.
F-IRB (Supervisory Slotting) approach covers other specialised lending portfolios such as project finance, object finance and commodities finance	• Obligors are mapped to the five supervisory slotting categories prescribed in MAS Notice 637 based on regulatory loan classifications.	• LGD and EAD are estimated based on rules prescribed in MAS Notice 637.

rating agency is likely to have a weak internal risk rating as well.

Table 4 on page 80 describes the approaches used to estimate the key parameters for Advanced Internal Ratings-Based (A-IRB) and Foundation Internal Ratings-Based (F-IRB) credit risk models used to calculate the CRWA.

- **Portfolio Reporting:** This includes internal and external reporting of portfolio risk information to the respective stakeholders. These reports provide a better understanding of how the credit portfolio risk trends are evolving in response to the changing operating environment and downside risks. Regular risk reports covering detailed metrics for credit portfolio exposures, quality, concentrations and hotspots covering dimensions such as geography, industry and business segment are provided to Senior Management and Board for making timely and better-informed decisions.

Using insights from portfolio modelling and reporting, we allocate appropriate risk and financial resources such as funding and capital to support growth opportunities. We use these insights to set credit concentration limits managing potential risks from adverse changes in the operating environment. The design of these limits considers direct and indirect risk drivers, such as economic sector, industry and geographic location, collateral type or other credit risk mitigation.

We also utilise these insights to identify and quantify more vulnerable segments and take proactive risk management actions when appropriate. This is especially crucial during periods of slow economic growth, high inflation, elevated interest rates, and heightened geopolitical tensions. These actions include actively tracking potentially vulnerable exposures; setting limits on maximum exposure; closely monitoring and reviewing vulnerable exposures; stress testing to assess potential credit impact; implementing risk mitigation and remedial management measures; and ensuring prudent provisioning and adequate capital allocation if needed.

Credit Risk Mitigation

We use various credit risk mitigation measures such as holding collateral, buying credit protection and setting netting arrangements to reduce credit risk exposures. However, risk mitigation does not replace our proper assessment of the obligor's ability to repay, which remains the primary repayment source.

Our credit policies outline the key considerations for eligible credit risk mitigants including legal certainty and enforceability, correlation, liquidity, marketability, counterparty risk of the credit protection provider and collateral-specific minimum operational requirements. Eligible physical and financial collateral include cash, real estate, marketable securities, standby letters of credit and credit insurance.

Where collateral is taken, appropriate haircuts are made to the value to reflect its inherent nature, quality, liquidity and volatility. Regular independent valuations of the collateral are conducted. We also monitor our collateral holdings to maintain diversification across asset classes and markets. We accept guarantees from individuals, corporates and institutions as a form of support. Where guarantees are recognised as credit risk mitigants via the PD substitution approach, we have established eligibility criteria and guidelines.

Netting, collateral arrangements, early termination options and central clearing mechanisms are common risk mitigation tools to manage counterparty credit risk. In approved netting jurisdictions, netting agreements allow us to offset our obligations against what is due from the counterparty in the event of a default, thereby reducing credit risk exposure. Collateral arrangements are typically governed by market standard documentation such as the International Swaps and Derivatives Association (ISDA) and Credit Support Annexes (CSA) or Global Master Repurchase Agreements (GMRA). Such arrangements require the posting of additional collateral if the mark-to-market exposures exceed the agreed threshold amount. We apply a haircut to the value of the eligible collateral to cover potential adverse market volatility. Regulatory margin requirements may apply to the agreed threshold amount. ISDA agreements may also include rating triggers to allow for transaction termination or require additional collateral if a rating downgrade occurs. Given our current investment grade rating, a one-notch rating downgrade would result in a minimal increase in collateral to be posted. Where possible, we also clear Over-the-Counter (OTC) derivatives transactions through approved central clearing counterparties, thereby replacing the counterparty's credit risk with that of a highly regulated and better credit rated central clearing counterparty.

Remedial Management

Processes are in place to foster early identification of vulnerable borrowers. The quality of our credit portfolios is proactively monitored and discussed at various risk forums. Action plans to remediate deteriorating trends are worked out and reviewed at such forums.

We classify our credit exposures as restructured assets when we grant non-commercial concessions to borrowers who are unable to meet their original repayment obligations. We further classify a restructured credit exposure into the appropriate non-performing grade based on our assessment of the borrower's financial condition and ability to repay under the restructured terms. Such credit exposure must comply fully with the restructured terms for a reasonable period before it can be restored to performing status in accordance with MAS Notice 612.

Dedicated remedial management units manage the restructuring, work-out and recovery of non-performing assets (NPAs) for wholesale portfolios. The goal is to rehabilitate NPAs where possible or maximise recoveries for NPAs that are on an exit strategy. For retail portfolios, we develop appropriate risk-based and

time-based collections strategies to maximise recoveries while trying to minimise impact to our customers. We use data such as delinquency buckets and adverse status tags for delinquent consumer loans to constantly analyse, refine and prioritise our collection efforts.

Credit Loss Allowances

We maintain sufficient allowances to absorb credit losses inherent in our loan portfolios. Allowance for Expected Credit Losses (ECL) is recognised for credit-impaired and non-credit-impaired exposures in accordance with Singapore Financial Reporting Standard (International) 9: *Financial Instruments* (SFRS(I) 9) and MAS Notice 612 through a forward-looking ECL model.

We assess our ECL allowances on a forward-looking basis, taking into account the three stages of credit risk below.

Stages of Credit Risk and Expected Credit Losses

Please refer to Note 2.11 in the Group's Financial Statements for more information on impairment allowances.

Market Risk Management

Market risks arise primarily from our trading, client servicing and balance sheet management activities. Given the high interest rates and volatile geopolitical environment, it is paramount that the management of market risk is robust and timely. This is achieved through market risk management approach, identification, measurement, monitoring, reporting and control.

Market Risk Management Approach

Group level market risk policies and procedures are established to provide common guidelines and standards for managing market risks. We regularly review our market risk management strategy and limits established within our risk appetite and in line with our business strategies taking into account prevailing macroeconomic and market conditions.

Market Risk Identification

Our internal approval processes ensure that market risk is properly identified and quantified, allowing us to manage and mitigate such risks.

Market Risk Measurements

Value-At-Risk

Value-at-risk (VaR) is a key metric used to quantify market risk exposures arising from our trading portfolio activities. VaR is measured and monitored by individual market risk components, namely interest rate risk, foreign exchange risk, equity risk and credit spread risk, as well as at the aggregate level. Our VaR model is based on the historical simulation approach, calibrated at the 99% confidence level and a one-day holding period. A 99% confidence level means that, statistically, losses on a single trading day may

Table 5: VaR by Risk Type – Trading Portfolio

	2023				2022			
SGD Million	End of the period	Average	Minimum	Maximum	End of the period	Average	Minimum	Maximum
Interest Rate VaR	**4.2**	**7.6**	**4.2**	**12.6**	4.9	5.3	1.4	8.0
Foreign Exchange VaR	**2.5**	**3.1**	**1.1**	**9.3**	3.6	1.7	0.4	6.8
Equity VaR	**1.0**	**1.9**	**0.8**	**3.0**	1.0	2.0	0.6	4.9
Credit Spread VaR	**2.2**	**5.7**	**1.9**	**12.0**	5.8	3.6	1.9	6.8
Diversification Effect[1]	**(4.4)**	**(9.1)**	**NM[2]**	**NM[2]**	(6.9)	(5.8)	NM[2]	NM[2]
Aggregate VaR[3]	**5.5**	**9.2**	**5.0**	**16.0**	8.3	6.8	2.8	11.1

(1) Diversification effect is computed as the difference between Aggregate VaR and the sum of asset class VaRs.
(2) Not meaningful as the minimum and maximum VaRs may have occurred on different days for different asset classes.
(3) Aggregate VaR includes Carbon trading exposure that is not material.

exceed VaR on average, once every 100 days. Table 5 on page 82 provides a summary of the Group's trading VaR profile by risk type as of 31 December 2023 and 31 December 2022.

Other Risk Measures

As our main market risk arises from interest rate movements, Present Value of a Basis Point (PV01) which measures the change in value of interest rate-sensitive exposures resulting from a one basis point increase across the entire yield curve is an important measure that is monitored on a daily basis. Other than VaR and PV01, we use risk metrics such as notional positions, Profit & Loss (P&L) for One Basis Point Move in Credit Spreads (CS01) and other risk variables for specific exposure types.

Stress Testing and Scenario Analysis

We perform stress testing and scenario analyses to assess and quantify potential losses from unlikely but plausible extreme market conditions. We regularly review and adjust the stress scenarios to ensure their relevance to our trading portfolio activities and risk profile, as well as current and forecasted economic conditions. These analyses determine if potential losses from such extreme market conditions are within our risk tolerance. In addition to regular stress scenarios, we also use ad hoc event specific stress scenarios to assess the potential impact of specific market conditions on our market risk exposures.

Risk Monitoring, Reporting and Control

Limits

Trading units may only undertake authorised trading activities for approved products. All trading risk positions are monitored on a daily basis against approved and allocated limits. Trading activities are conducted within approved mandates and dynamically hedged to remain within limits. Hedge effectiveness is enforced through independent limit monitoring to ensure compliance with market risk limits. Limits are approved to reflect our risk appetite and manage the downside risks from trading opportunities, with clearly defined exception escalation procedures. We report exceptions, including temporary breaches, promptly to Senior Management and the Board. We also manage market risk exposure holistically by using multiple risk limits (VaR and risk sensitivities), P&L stop loss and other measures.

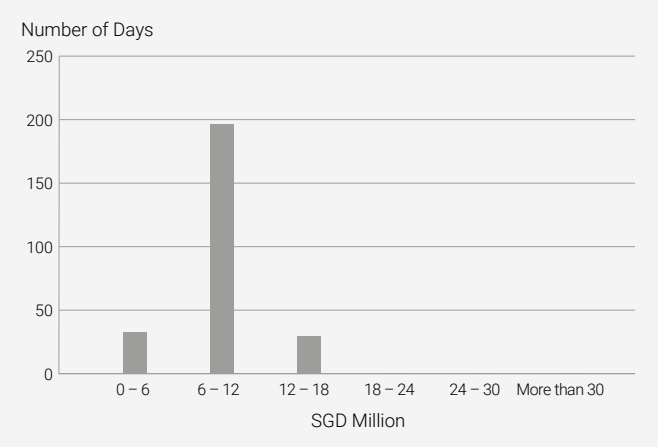
Model Validation

Model validation is an integral part of our risk control process. Financial models are used to price financial instruments and calculate VaR. We ensure that the models used are fit for their intended purposes through periodic independent validation and reviews. To enhance the integrity of the trading P&L and risk measures generated, we source market rates independently for risk measurement and valuation.

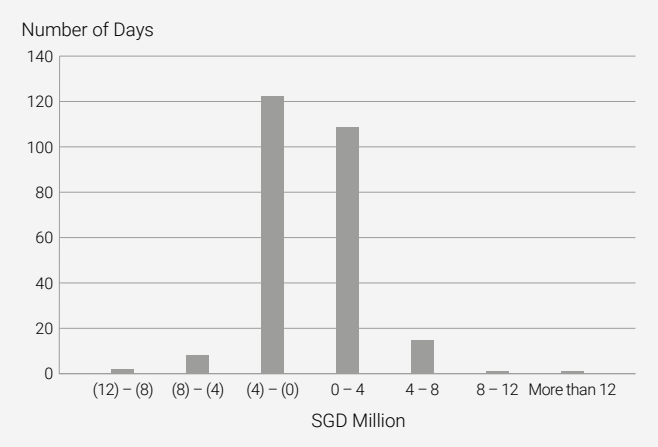
Back Testing

To ensure the continued integrity of our VaR models, we back-test the VaR against actual trading P&Ls and hypothetical P&Ls daily to confirm that the models do not underestimate our market risk exposures. The charts below illustrate the Frequency Distribution of Group Trading Book's Daily Total VaR and P&L.

Frequency Distribution of Group Trading Book's Daily Total VaR (One Day Holding Period) for FY 2023



Frequency Distribution of Group Trading Book's Daily Hypothetical P&L for FY 2023



Interbank Offered Rates (IBOR) Transition

The London Interbank Offered Rate (LIBOR), formerly a key benchmark in international financial markets, has been phased out and replaced by Risk Free Rates (RFRs). All British pound, Euro, Swiss franc and Japanese yen LIBORs, as well as the 1-week and 2-month US dollar LIBOR were discontinued on 31 December 2021. All remaining US dollar LIBORs were discontinued on 30 June 2023.

The discontinuation of LIBOR had a direct impact on the viability of the Singapore Dollar Swap Offer Rate (SOR), which relied on US dollar LIBOR in its computation. Additionally, like LIBOR, the Singapore Interbank Offered Rate (SIBOR), a key benchmark widely used in retail loans, is subject to expert judgement due to a lack of underlying transactions. The Singapore Overnight Rate Average (SORA) was identified as the alternative benchmark to SOR and SIBOR. MAS established an industry-led Steering Committee for SOR & SIBOR Transition to SORA (SC-STS) to oversee the coordination and implementation of the transition efforts.

To ensure a smooth transition from LIBOR to RFRs and SOR and SIBOR to SORA, we also established an internal Steering Committee to coordinate efforts across various business, control and support functions. We make the necessary system upgrades and modifications to ensure the readiness of our infrastructure and processes in a timely manner.

We have also assessed the adequacy of provisions relating to the discontinuation of benchmarks in our documentation for loans, derivatives, debt instruments and other relevant transactions, and remediated the necessary documentation. With the cessation of US dollar LIBOR and SOR on 30 June 2023, all retail and corporate loans and derivatives referencing SOR have successfully transitioned to SORA, fixed rates or other industry standard replacement rates. Appropriate adjustments were made as recommended by the industry to reflect the differences between SOR and SORA. As of 31 December 2023, loans and derivatives referencing US dollar LIBOR have also successfully transitioned to the Secured Overnight Financing Rate (SOFR), fixed rates or other industry standard replacement rates as agreed between contracting parties. There was no significant impact from the cessation of US dollar LIBOR and SOR.

For SIBOR, the transition will be completed in 2024 in line with the roadmap established by the industry. No significant impact is expected from the transition of SIBOR to SORA.

Asset Liability Management

Asset liability management is the strategic management of our balance sheet structure and liquidity requirements. It covers liquidity sourcing and diversification, as well as interest rate and structural foreign exchange management.

Asset Liability Management Approach

Our asset liability management framework focuses on managing the balance sheet exposures that give rise to liquidity risk, Interest Rate Risk in the Banking Book (IRRBB) and structural foreign exchange risk. The asset liability framework consists of key elements that facilitate the asset liability management risk process, including comprehensive risk measures and actively monitored risk limits, all supported by strong data capabilities and risk systems.

Liquidity Risk

Liquidity risk refers to the risk of being unable to meet our contractual and regulatory financial obligations. The objective of liquidity risk management is to ensure that we continue to fulfil our financial obligations and to undertake new transactions, through the management of liquidity and funding risks within our risk appetite.

Liquidity Risk Identification

Liquidity risks arise from cashflow mismatches in maturing assets, liabilities and off-balance sheet items. Liquidity risks are also identified through the monitoring of early warning indicators of potential liquidity risk, which take into account the market environment as well as any other financial risks that could potentially trigger a liquidity risk event. Early identification of liquidity risk is crucial for effective management of our funding requirements and liquidity risks.

Liquidity Risk Measurements

Liquidity risk metrics consist of a framework for projecting cash flows on both contractual and behavioural bases under business as usual and stressed market scenarios. We also established liquidity and funding concentration ratios to measure and manage the effective diversification of funding sources, and the adequacy of sources of liquidity under stressed conditions.

Liquidity Stress Testing

We perform stress testing and scenario analyses under a range of scenarios to assess the potential impact of extreme market events on our liquidity risk profile. We regularly review these stress scenarios in the context of the prevailing risk climate, financial conditions and liquidity strategies. Stress testing bolsters our resilience in the face of liquidity stresses, helping us to anticipate and set aside sufficient liquidity buffers while applying the relevant stress testing outcomes to develop effective funding strategies, policies and contingency funding plans.

Liquidity Risk Monitoring, Reporting and Control

Liquidity risk positions are monitored and reported against approved liquidity risk limits and triggers. Limits are established in alignment with our risk appetite, taking into account our funding capacity, business requirements and the liquidity environment we operate in. There is also an established review, oversight and escalation process to facilitate prompt

escalation and remediation of any limit exceptions. To facilitate the risk monitoring and reporting processes, we continually invest in the development of risk and management information systems and analyses to support the liquidity risk framework.

Interest Rate Risk in the Banking Book (IRRBB)

IRRBB refers to the current and prospective risk of interest rates to the Bank's capital and earnings. The primary goal of the management of IRRBB is to ensure that interest rate risk exposures are consistent with our risk appetite and maintained within the defined risk tolerance.

Interest Rate Risk Identification

Interest rate risks arise from interest rate sensitive instruments which are repriced at different times (gap risk), are repriced by referencing different interest rate benchmarks (basis risks), or possess optionality with respect to timing of cashflows or interest reset under different circumstances (optionality risk).

Interest Rate Risk Measurements

We measure IRRBB from the perspective of both earnings and capital. Net Interest Income (NII) sensitivity estimates the potential change in earnings over a one-year horizon: Economic Value of Equity (EVE) sensitivity estimates the potential impact on the Bank's capital under various interest rate shock scenarios. Interest rate sensitivity measures such as PV01 and repricing gap profile analysis are also part of the risk metrics employed. Behavioural models are adopted to assess interest rate risks in relation to loan prepayment, time deposit early redemption and the profile of non-maturity deposits. Appropriate systems and standards are used in the quantification and measurement of IRRBB.

Interest Rate Risk Stress Testing

We perform IRRBB stress testing under a range of scenarios encompassing historical and hypothetical scenarios, as well as regulatory prescribed interest rate shock scenarios. The stress tests assess the potential impact of adverse scenarios on our financial condition, where stress limits and management actions are integrated with the stress test results.

Interest Rate Risk Monitoring, Reporting and Control

Interest rate risk positions and metrices are comprehensively monitored against approved risk limits and triggers. Interest rate risk limits are aligned with the risk appetite and prevailing risk outlook. There is also an established review, oversight and escalation process to facilitate prompt escalation and remediation of any limit exceptions. We invest in the development of risk systems to support the monitoring and analysis of interest rate risks.

Structural Foreign Exchange Risk Identification

Structural Foreign Exchange (SFX) exposures arise from non-Singapore Dollar exposures in overseas branches, subsidiaries, other strategic investments and property assets. They affect the Bank's Capital Adequacy Ratio (CAR) and total equity through the impact on Foreign Currency Translation Reserves (FCTR). The objective of structural FX risk management is to protect the capital and financial soundness of the Bank by managing the potential impact arising from adverse FX movements, through monitoring, stress testing and hedging where appropriate.

SFX Stress Testing, Monitoring and Reporting

We implement a comprehensive risk management methodology to ensure appropriate and effective risk capturing and controls around SFX exposures. We monitor the SFX impact on our capital and CAR stability and perform regular assessments to ensure the potential losses under severe market stress scenarios are within our risk tolerance.

Other Risks

Non-structural foreign exchange exposures in our banking book are largely transferred to our trading book for foreign exchange risk management. In addition, we are exposed to credit spread risk through the holding of High-Quality Liquid Assets (HQLA) in our banking book to comply with the Liquidity Coverage Ratio (LCR) requirements. While the default risk for HQLA is low, their value could be sensitive to changes in credit spreads. This risk is monitored against approved CS01 limits on a daily basis and subject to historical and anticipatory stress testing. The other risk residing in our banking book is equity price risk arising from our equity investments in listed and non-listed companies. Equity investments (excluding those held by GEH) form an insignificant portion of our overall securities portfolio.

Operational Risk Management

Operational risk is the risk of loss caused by failures in internal processes, systems, poor management, human error or external events. This risk is inherent in all banking products, activities, processes and systems. It covers various non-financial risks including fraud; money laundering, terrorism financing and sanctions risk; third-party risk; physical and people security risk; conduct risk; business continuity risk; unauthorised trading risk and regulatory, legal and reputational risk.

Operational Risk Management Approach

We recognise the heightened risk of business disruptions arising from operational failures and the importance of strengthening our operational resiliency. We continue to anticipate and prevent potential operational events through robust risk management practices.

Our operational risk management framework sets out our approach to managing and controlling the operational risks arising from the Group's business activities and operations. This includes regular review of our operational risk profile, comprising operational risk events, key risk indicators, material issues and trends. Senior Management and the Board receive regular updates on the operational risk profile and an annual assurance report assessing the adequacy and effectiveness of our internal controls and risk management systems.

In addition, the operational risk management framework is supported by various programmes that ensure preparedness and, minimise the impact of any adverse event through a timely response, recovery, and adaptability, thus ensuring the continued provision of essential services. The table below shows the key components of operational risk management.

Table 6: Key Components of Operational Risk Management

Risk Management Capabilities	**New Product Approval** • A stringent process to identify and mitigate risks inherent in new products or the distribution/ marketing of new products, ensure prudent allocation of resources and capital, and compliance with regulatory requirements. **Third-Party Risk Management** • Scrutiny of outsourced and third-party service providers through stringent onboarding and ongoing due diligence assessments. **Business Continuity Management** • Regular reviews to identify the Bank's Critical Business Services and Service Recovery Time Objective. • Establishment, review and regular testing of recovery strategies and business recovery plans. **Anti-Money Laundering / Countering the Financing of Terrorism** • Enhanced risk assessment methodologies that overlay on existing monitoring and screening platforms to assess customer, product and geographical risks. • Robust risk surveillance capabilities that leverage AI and data analytics for dynamic monitoring and detection of emerging financial crime trends and typologies. **Anti-Fraud** • Transaction monitoring capabilities to detect and alert customers of suspicious account activities, and to prevent the completion of such transactions. • Ongoing efforts to strengthen the fraud surveillance systems in response to changes in fraud/scam typologies and regulatory landscape.
Incident Response and Crisis Response	• Crisis Management procedures and playbooks to guide the Bank's responses to potential crisis events such as pandemic situations, surge in fraud and scams and, cyber-attacks. • A comprehensive governance and anti-fraud response model to expedite incident handling through the Dynamic Response Committee (DRC) and Anti-Fraud Standing Committee (AFSC).
Insurance	• Financial lines insurance programmes in place to cover key operational risks: – Bankers Blanket Bond and Professional Indemnity Programme – Cyber and Network Security Liability Insurance Programme
Awareness and Training	• An Operational Risk Working Group that fosters continuous engagement with stakeholders across the organisation, facilitating awareness and understanding of operational risk. • Availing of targeted and specialised training, including certified courses recognised by the Institute of Banking and Finance (IBF) and International Compliance Training Academy (ICA), to raise staff competency.
Industry Collaboration	• Active participation in industry committees and working groups (e.g. Association of Banks in Singapore (ABS) Outsourcing Advisory Committee, ABS Standing Committee on Business Resilience and Continuity) to share and stay abreast of developments in the operational risk landscape.

Information Security and Digital Risk Management

Information security and digital risk is a business risk that comprises the risk domains of information, cyber and technology risks. Effective management of information security and digital risk is critical to minimising any impact on our customers and any financial, operational, reputational, legal and/or regulatory impact on the Group.

Information Security and Digital Risk Management Approach

Robust management of information security and digital risks remain a key focus in view of the Bank's continued digitalisation efforts and the evolving cyber threat landscape, further exacerbated by factors such as adoption of new technology by threat actors (e.g. using generative AI to develop more realistic phishing emails) and geopolitical conflicts (e.g. possible associated cyber-attacks).

To achieve resilience for the Group, our information security and digital risk framework sets out a comprehensive approach towards governing and managing information security and digital risks. This includes regular review of key risk areas, considering other factors such as incidents, regulatory expectations and emerging risks, to facilitate the prioritisation of risk management activities including risk monitoring and risk reporting (e.g. group-wide risk profiles, related key trends and significant incidents) to Senior Management and the Board.

In addition, an organisation strategy comprising the following key components has been adopted:

Table 7: Key Components of Information Security and Digital Risk Management

Preventive, detective and response capabilities	• A 24-by-7 Cybersecurity Operations Centre and a Technology Command Centre that monitor our networks and systems for potential cyber threats or disruptions to our financial services. • Ongoing monitoring of cyber threat intelligence to identify any indication of potential cyber events that could target or impact the Bank. • Regular review and testing of existing controls, with new capabilities added where necessary to take into account evolving threats.
Awareness & Vigilance Uplift & Testing Programmes	• Mandatory cyber and information security awareness e-learning, regular risk awareness broadcasts and social engineering testing programmes covering all staff. • Group-wide internal Cyber Smart Programme to improve related knowledge, skills, and behaviours, through gamification and curated activities. • Refreshed Cyber Certification Pathway to further raise the proficiency level of selected staff. • Regular security advisories to raise awareness of customers, as well as initiatives to familiarise selected outsourced services providers with control expectations of the Group.
Incident Response and Crisis Management	• Robust incident response and crisis management processes to mitigate the impact from disruption of essential financial services during times of crisis. • Regular simulation exercises to improve the readiness of our cybersecurity incident response team, as well as crisis management exercises to enhance the preparedness of senior management. • Established processes to facilitate a prompt response to a cyber-attack on our third-party service providers.
Cyber and Network Security Insurance	• Relevant cyber and network security insurance to cover damages arising from specific cyber-attacks and technology disruption scenarios (including cyber extortion and business interruption losses due to a security breach or system failure).
Collaboration with regulators and industry partners	• Active engagement with regulatory agencies in Singapore, Malaysia, China and Hong Kong as well as the Financial Services Information Sharing and Analysis Centre to exchange cyber threat intelligence. • Participation in industry committees and working groups (e.g. the ABS Standing Committee on Cyber Security) to share information security and digital risk-related updates.