

Risk

(Figures expressed in millions of Hong Kong dollars unless otherwise indicated)

Our approach to risk

Our risk appetite

We recognise the importance of a strong risk culture, which refers to our shared attitudes, values and standards that shape behaviours related to risk awareness, risk taking and risk management. All our people are responsible for the management of risk, with the ultimate accountability residing with the Board.

We seek to build our business for the long term by balancing social, environmental and economic considerations in the decisions we make. Our strategic priorities are underpinned by our endeavour to operate in a sustainable way. This helps us to carry out our social responsibility and manage the risk profile of the business. We are committed to managing and mitigating climate-related risks, both physical and transition, and continue to incorporate consideration of these into how we manage and oversee risks internally and with our customers.

The following principles guide the Group's overarching appetite for risk and determine how our businesses and risks are managed.

Financial position

- We aim to maintain a strong capital position, defined by regulatory and internal capital ratios.
- We carry out liquidity and funding management for each operating entity, on a stand-alone basis.

Operating model

- We seek to generate returns in line with a conservative risk appetite and strong risk management capability.
- We aim to deliver sustainable earnings and consistent returns for shareholders.

Business practice

- We have zero tolerance for any of our people knowingly engaging in any business, activity or association where foreseeable reputational risk or damage has not been considered and/or mitigated.
- We have no appetite for deliberately or knowingly causing detriment to consumers, or incurring a breach of the letter or spirit of regulatory requirements.
- We have no appetite for inappropriate market conduct by any member of staff or by any business.

Enterprise-wide application

Our risk appetite encapsulates the consideration of financial and non-financial risks. We define financial risk as the risk of a financial loss as a result of business activities. We actively take these types of risks to maximise shareholder value and profits. Non-financial risk is defined as the risk to achieving our strategy or objectives as a result of failed internal processes, people and systems or from external events.

Our risk appetite is expressed in both quantitative and qualitative terms. It continues to evolve and expand its scope as part of our regular review process.

The Board reviews and approves the Group's risk appetite twice a year to make sure it remains fit for purpose. The risk appetite is considered, developed and enhanced through:

- an alignment with our strategy, purpose, values and customer needs;
- trends highlighted in other Group risk reports;
- communication with risk stewards on the developing risk landscape;
- strength of our capital, liquidity and balance sheet;
- compliance with applicable laws and regulations;
- effectiveness of the applicable control environment to mitigate risk, informed by risk ratings from risk control assessments;
- functionality, capacity and resilience of available systems to manage risk; and
- the level of available staff with the required competencies to manage risks.

We formally articulate our risk appetite through our risk appetite statement ('RAS'), which is approved by the Board on the recommendation of the Risk Committee ('RC'). Setting out our risk appetite ensures that we agree a suitable level of risk for our strategy. In this way, risk appetite informs our financial planning process and helps senior management to allocate capital to business activities, services and products.

The RAS consists of qualitative statements and quantitative metrics, covering financial and non-financial risks. It is applied to the development of business line strategies, strategic and business planning, and remuneration.

Performance against the RAS is reported to the Risk Management Meeting ('RMM') regularly to support targeted insight and discussion on breaches of risk appetite and associated mitigating actions. This reporting allows risks to be promptly identified and mitigated, and informs risk-adjusted remuneration to drive a strong risk culture.

Risk Management

We recognise that the primary role of risk management is to protect our customers, business, colleagues, shareholders and the communities that we serve, while ensuring we are able to support our strategy and provide sustainable growth. This is supported through our three lines of defence model.

The implementation of our business strategy remains a key focus. As we implement change initiatives, we actively manage the execution risks. We also perform periodic risk assessments, including against strategies to help ensure retention of key personnel for our continued safe operation.

We aim to use a comprehensive risk management approach across the organisation and across all risk types, underpinned by our culture and values. This is outlined in our risk management framework, including the key principles, policies and practices that we employ in managing material risks, both financial and non-financial.

The framework fosters continual monitoring, promotes risk awareness and encourages a sound operational and strategic decision making and escalation process. It also supports a consistent approach to identify, assess, manage and report the risks we accept and incur in our activities. We continue to enhance our approach to managing risk, through our activities with regard to people and capabilities; governance; reporting and management information; credit risk management models; and data.

Our risk management framework

The following diagram and descriptions summarise key aspects of the risk management framework, including governance and structure, our risk management tools and our risk culture, which together help align employee behaviour with our risk appetite.

Key components of our risk management framework

Our Values and Risk Culture		
Risk governance	Non-executive risk governance	The Board approves the risk appetite, plans and performance targets. It sets the 'tone from the top' and is advised by the RC.
	Executive risk governance	Our executive risk governance structure is responsible for the enterprise-wide management of all risks, including key policies and frameworks for the management of risk within the Group.
Roles and responsibilities	Three lines of defence model	Our 'Three lines of defence' model defines roles and responsibilities for risk management. An independent Risk function helps ensure the necessary balance in risk/return decisions.
Processes and tools	Risk appetite	The Group has processes in place to identify/assess, monitor, manage and report risks to help ensure we remain within our risk appetite.
	Enterprise-wide risk management tools	
	Active risk management: identification/assessment, monitoring, management and reporting	
Internal controls	Policies and procedures	Policies and procedures define the minimum requirements for the controls required to manage our risks.
	Control activities	Non-financial risk stewards define the minimum control standards for managing non-financial risks.
	Systems and infrastructure	The Group has systems and/or processes that support the identification, capture and exchange of information to support risk management activities.

Risk governance

The Board has ultimate responsibility for the effective management of risk and approves our risk appetite. It is advised on risk-related matters by the RC.

The Chief Risk Officer, supported by the RMM, holds executive accountability for the ongoing monitoring, assessment and management of the risk environment and the effectiveness of the risk management framework.

The management of regulatory compliance risk and financial crime risk reside with Chief Compliance Officer. Oversight is maintained by the Chief Risk Officer in line with his enterprise risk oversight responsibilities, through the RMM.

Day-to-day responsibility for risk management is delegated to senior managers with individual accountability for decision making. All our people have a role to play in risk management. These roles are defined using the three lines of defence model, which takes into account the Group's business and functional structures.

We use a defined executive risk governance structure to help ensure there is appropriate oversight and accountability of risk, which facilitates reporting and escalation to the RMM.

A Product Oversight Committee reporting to the RMM and comprising senior executives from Risk, Legal, Compliance, Finance, and Operations/IT, is responsible for reviewing and approving the launch of such new products and services. Each new service and product launch is also subject to an operational risk self-assessment process, which includes identification, evaluation and mitigation of risk arising from the new initiative. Internal Audit is consulted on the internal control aspect of new products and services in development prior to implementation.

Our roles and responsibilities

All our people are responsible for identifying and managing risk within the scope of their roles. Roles are defined using the three lines of defence model, which takes into account our business and functional structure.

Three lines of defence

To create a robust control environment to manage risks, we use an activity-based three lines of defence model. This model delineates management accountabilities and responsibilities for risk management and the control environment.

This model underpins our approach to risk management by clarifying responsibility and encouraging collaboration, as well as enabling efficient coordination of risk and control activities.

The three lines of defence are summarised below:

- The first line of defence owns the risks and is responsible for identifying, recording, reporting and managing them in line with risk appetite, and ensuring that the right controls and assessments are in place to mitigate them.
- The second line of defence sets the policy and guidelines for managing specific risk areas, provides advice and guidance in relation to the risk, and challenges the first line of defence on effective risk management.
- The third line of defence is our Internal Audit function, which provides independent assurance that our risk management, governance and internal control processes are designed and operating effectively.

Independent risk function

The Group's Risk function, headed by the Chief Risk Officer, is responsible for the Group's risk management framework. This responsibility includes establishing and monitoring of risk profiles, and identifying and managing forward-looking risk. The Group's Risk function is made up of sub-functions covering all risks to our operations and forms part of the second line of defence. It is independent from the businesses, including sales and trading functions, to provide challenge, appropriate oversight and balance in risk/return decisions.

Responsibility for minimising both financial and non-financial risk lies with our people. They are required to manage the risks of the business and operational activities for which they are responsible.

We maintain adequate oversight of our risks through various specialist Risk Stewards, along with our aggregate overview through Chief Risk Officer.

Risk management tools

The Group uses a range of tools to identify, monitor and manage risk. The key tools are summarised below.

Risk appetite

The RAS is a written articulation of the level and types of risk that the Group is willing to take in order to achieve its strategic objectives. Our risk appetite encapsulates consideration of both financial and non-financial risks and is expressed in both quantitative and qualitative terms.

The RMM reviews the Group's actual risk appetite profile against the limits set out in the RAS regularly to enable senior management to monitor the risk profile and guide business activities in order to balance risk and return. The actual risk appetite profile is also reported to the RC and Board by Chief Risk Officer including material deviation and related management mitigating actions.

Risk map

The Group uses a risk map to provide a point-in-time view of its residual risk profile across both financial and non-financial risks. This highlights the potential for these risks to materially affect our financial results, reputation or business sustainability. Risk stewards assign risk ratings, supported by commentary. Risks that have an 'Amber' or 'Red' risk rating require monitoring and mitigating action plans being either in place or initiated to manage the risk down to acceptable levels.

Top and emerging risks

(unaudited)

We use a top and emerging risks process to provide a forward-looking view of issues with the potential to threaten the execution of our strategy or operations over the medium to long term.

We proactively assess the internal and external risk environment, as well as review the themes identified across our organisation and global businesses, for any risks that may require escalation, updating our top and emerging risks as necessary.

We define a 'top risk' as a thematic issue that may form and crystallise within one year, and has the potential to materially affect the Group's financial results, reputation or long-term business model. It may arise across any combination of risk types, markets or global businesses. The impact may be well understood by senior management and some mitigating actions may already be in place.

An 'emerging risk' is defined as a thematic issue that has large unknown components, which may form and crystallise beyond a one-year time horizon. If it were to materialise, it could have a significant material impact on a combination of the Group's long-term strategy, profitability and/or reputation. Existing mitigating action plans are likely to be minimal, reflecting the uncertain nature of these risks at this stage. Some high-level analysis and/or stress testing may have been carried out to assess the potential impact.

Stress testing and recovery planning

The Group operates a wide-ranging stress testing programme that is a key part of our risk management and capital planning. Stress testing provides management with key insights into the impact of severely adverse events on the Group, and provides confidence to regulators on the Group's financial stability.

Our stress testing programme assesses our capital strength through a rigorous examination of our resilience to external shocks. As well as undertaking regulatory-driven stress tests, we conduct our own internal stress tests, in order to understand the nature and level of all material risks, quantify the impact of such risks and develop plausible business as usual mitigating actions.

Many of our regulators – including the Hong Kong Monetary Authority ('HKMA') – use stress testing as a prudential regulatory tool, and the Group has focused significant governance and resources to meet their requirements.

Internal stress tests

Our internal capital assessment uses a range of stress scenarios that explore risks identified by management. They include potential adverse macroeconomic, geopolitical and operational risk events, as well as other potential events that are specific to the Group.

The selection of scenarios is based upon the output of our top and emerging risks identified and our risk appetite. Stress testing analysis helps management understand the nature and extent of vulnerabilities to which the Group is exposed. Using this information, management decides whether risks can or should be mitigated through management actions or, if they were to crystallise, should be absorbed through capital. This in turn informs decisions about preferred capital levels and allocations.

In addition to the Group-wide stress testing scenarios, the Group also participate, as required, in the regulatory stress testing programmes of the jurisdictions in which they operate, and the stress tests of the HKMA. Functions and businesses also perform bespoke stress testing to inform their assessment of risks in potential scenarios.

The Group stress testing programme is overseen by the RC and results are reported, where appropriate, to the RMM and RC.

We also conduct reverse stress tests each year at a group level and, where required, at subsidiary entity level to understand potential extreme conditions that would make our business model non-viable. Reverse stress testing identifies potential stresses and vulnerabilities we might face, and helps inform early warning triggers, management actions and contingency plans designed to mitigate risks.

Recovery and resolution plans

Recovery and resolution plans form an integral framework in the safeguarding of the Group's financial stability. Together with stress testing, it helps us understand the outcomes of adverse business or economic conditions and the identification of mitigating actions.

Key developments in 2021

There were no material changes to the policies and practices for the management of risk in 2021. However, where required, appropriate exceptional handling approaches were exercised in response to Coronavirus Disease ('COVID-19') developments.

We continued to actively manage the risks resulting from the COVID-19 pandemic and its impacts on our customers and operations during 2021 as well as other key risks described in this section.

In 2021, we enhanced our risk management in the following areas:

- We streamlined the articulation of our risk appetite framework, providing further clarity on how risk appetite interacts with strategic planning and recovery planning processes.
- We continued to simplify our approach to non-financial risk management, with the implementation of more effective oversight tools and techniques to improve end-to-end identification and management of these risks.
- We continued to improve the effectiveness of our financial crime controls with a targeted update of our fraud controls. We refreshed our financial crime policies, ensuring they remained up-to-date and addressed changing and emerging risks, and we continued to meet our regulatory obligations. Since 2021, we have combined our RMM and Financial Crime Risk Management Committee Meetings to ensure a holistic view of all risks.
- We implemented enhanced governance and oversight around model adjustments and related processes for HKFRS 9 models and Sarbanes-Oxley controls.

- We have implemented second line of defence risk management for liquidity risk and interest rate risk in the banking book during 2021. Second line of defence for capital risk management is in progress.

Areas of special interest

(unaudited)

During 2021, a number of areas were identified and considered as part of our top and emerging risks because of the effect they may have on the Group. We place particular focus in this section on geopolitical and macroeconomic risks, IBOR transition, financial crime risk environment, risks related to COVID-19 and climate-related risks.

Geopolitical and macroeconomic risks

Our operations and portfolios are exposed to risks associated with US-China tensions, social unrest and COVID-19, which could lead to disruption of our operations, physical risk to our staff and/or physical damage to our assets.

The COVID-19 pandemic has heightened US-China tensions, which could have implications for the Group and its customers.

The US-China relationship in particular remains complex, with divisions over a number of critical issues. The US has imposed various sanctions and trade restrictions on Chinese persons and companies.

Certain measures are particularly relevant. The Hong Kong Autonomy Act passed by the US authorises secondary sanctions against non-US financial institutions found to be knowingly conduct significant transactions with individuals and entities that are determined by the US to have undermined Hong Kong's autonomy. In addition, the US has imposed restrictions on US persons' ability to buy or sell certain publicly traded securities of certain Chinese companies linked to China's defence and related material or surveillance sectors.

China in turn has announced a number of its own sanctions and trade restrictions that target foreign individuals and companies. These have been imposed mainly against certain public officials associated with the implementation of foreign sanctions against China. China has promulgated new laws that provide a legal framework for imposing further sanctions and export restrictions, including a law prohibiting the implementation of, or compliance with, foreign sanctions against China and which also creates a private rights of action in the Chinese courts for damages

caused by third parties implementing foreign sanctions or other discriminatory measures. These and any future measures and countermeasures that may be taken by the US and China may affect the Group, its customers, and the markets in which we operate.

China's expanding data privacy and cybersecurity laws could pose potential challenges to intra-Group data sharing. These developments could increase financial institutions' compliance burdens in respect of cross-border transfers of personal information. In Hong Kong, there is also an increasing focus by regulators on the use of big data and artificial intelligence.

Market concerns remain about repercussions for the Chinese domestic economy from the recent instability in the commercial real estate sector. We continue to monitor the situation closely, including potential indirect impacts, and seek to take mitigating actions as required.

We closely monitor the economic developments in key markets and sectors and actively manage our credit portfolio through enhanced monitoring, thematic reviews, internal stress tests, etc. We will continue to support our customers and manage risk and exposures as appropriate.

IBOR transition

Interbank Offered Rates ('IBORs') have historically been used extensively to set interest rates on different types of financial transactions and for valuation purposes, risk measurement and performance benchmarking.

Following the UK's Financial Conduct Authority ('FCA') announcement in July 2017 that it would no longer continue to persuade or require panel banks to submit rates for the London Interbank Offered Rate ('LIBOR') after 2021, we have been actively working to transition legacy contracts from IBORs and meet client needs for products linked to new near risk-free replacement rates ('RFRs') or alternative reference rates. In March 2021, in accordance with the 2017 FCA announcement, ICE Benchmark Administration Limited ('IBA') announced that it would cease publication of 26 of the 35 main LIBOR currency interest rate benchmark settings from the end of 2021, but that the most widely used US dollar LIBOR settings would cease from 30 June 2023. As a result, our focus during 2021 was on the transition of legacy contracts referencing the LIBOR settings that demised from the end of 2021.

During 2021, we continued the development of IT and RFR product capabilities, implemented supporting operational processes, and engaged with our clients to discuss options for the transition of their legacy contracts. The successful implementation of new processes and controls, as well as the transition of contracts away from IBORs, reduced the heightened financial and non-financial risks to which we were exposed. However, while all but exceptional new LIBOR contract issuance ceased in 2021, and from the end of 2021 for US dollar, we remain exposed to risks, including legacy contracts that reference US dollar LIBOR, which are expected to demise from June 2023.

Financial risks have been largely mitigated as a result of the implementation of model and pricing changes. However, differences in US dollar LIBOR and its replacement rate RFR, Secured Overnight Funding Rate ('SOFR') create a basis risk in the trading book and banking book due to the asymmetric adoption of SOFR across assets, liabilities and products that we need to actively manage through appropriate financial hedging. Additionally, the relatively limited use of SOFR in financial markets to date could result in insufficient liquidity risk to transition legacy US dollar contracts during 2022. This could potentially delay transition of some US dollar contracts into 2023, compressing the amount of time for transition, which could lead to heightened operational and conduct related risks as a result.

Additional non-financial risks including financial reporting risks relating to potential mis-statements due to the complexity in applying accounting reliefs relating to amendment of legacy contracts and legal risk continue to exist.

These risks are present in different degrees across our product offering.

Transition legacy contracts

During 2021, we either successfully transitioned or confirmed appropriate fallback for all legacy IBOR contracts in sterling, Swiss franc, Euro and Japanese yen LIBOR interest rates, with no 'tough legacy' contracts remaining. Our approach to transition US dollar LIBOR legacy contracts will differ by product and business area, but will be based on the lessons learnt from the successful transition of contracts during 2021. We will continue to communicate with our clients and investors in a structured manner and be client led in the timing and nature of the transition.

For derivatives, all our sterling, Swiss franc, Euro and Japanese yen LIBOR interest rate exposures at year-end had no further such rate fixings post year end. We anticipate our US dollar exposures will continue to reduce through 2022 as a result of contract maturities, active transition and the cessation of new US dollar LIBOR issuance. We will continue to look to actively reduce our US dollar LIBOR exposures by transitioning trades ahead of the demise date of 30 June 2023, by working with our clients to determine their needs and alternative approaches. Additionally, we are working with market participants, including clearing houses, to ensure we are able to transition contracts as the US dollar LIBOR cessation date approaches.

For our loan book, most of our reported exposure at the end of 2021 relates to sterling, Swiss franc, Euro and Japanese yen LIBOR interest rate contracts that required no further client negotiation. The remaining exposure relates to one syndicated transaction which has continued in early 2022, and this has led to further transition being completed. If the contract is unable to transition prior to the first interest payment date in 2022, it is expected to use an alternative rate determined by the contractual language and governing law. For the remaining demising IBORs, notably US dollar LIBOR, we have implemented new products and processes and updated our systems in readiness for transition. Global Banking, and Commercial Banking have begun to engage with clients who have upcoming contract maturities with a view to refinancing using an appropriate replacement rate. Further communication and outreach to customers with US dollar LIBOR contracts with later maturities will occur in due course.

Where we hold bonds issued by other institutions, we have remained dependent on the issuer's agents to engage in the transition process, although analysis will be undertaken of the issuers in US dollar LIBOR bonds to reduce our exposure, as occurred through 2021.

The completion of an orderly transition from the remaining IBORs, notably US dollar LIBOR, continues to be our programme's key objective through 2022 and 2023, with the aim of putting systems and processes in place to help achieve this.

Mitigating actions

- Our IBOR transition programme, which is overseen by the Chief Risk Officer and Compliance Officer, will continue to deliver IT and operational processes to meet the objectives.
- We carry out extensive training, communication and client engagement to facilitate appropriate selection of new rates and products and we have dedicated teams in place to support the transition.
- We actively transition legacy contracts and ceased new issuance of LIBOR based contracts, in line with regulatory expectations and with associated monitoring and controls.
- We access, monitor and dynamically manage risks arising from IBOR transition, and implement specific mitigating controls when required.
- We continue to actively engage with regulatory and industry bodies to mitigate risks relating to 'tough legacy' contracts.

Financial instruments impacted by IBOR reform

(audited)

Amendments to HKFRSs issued in October 2020 (Interest Rate Benchmark Reform Phase 2) represents the second phase of the project on the effects of interest rate benchmark reform addressing issues affecting financial statements when changes are made to contractual cash flows and hedging relationships as a result of reform.

Under these amendments, changes made to a financial instrument measured at other than fair value through profit or loss that are economically equivalent and required by interest rate benchmark reform, do not result in the derecognition or a change in the carrying amount of the financial instrument. Instead, they require the effective interest rate to be updated to reflect the change in the interest rate benchmark. In addition, hedge accounting will not be discontinued solely because of the replacement of the interest rate benchmark if the hedge meets other hedge accounting criteria.

The Group has adopted the amendments from 1 January 2020.

(audited)	Financial instruments yet to transition to alternative benchmarks, by main benchmark			
	USD LIBOR (HK\$m)	GBP LIBOR (HK\$m)	JPY LIBOR (HK\$m)	SIBOR (HK\$m)
At 31 December 2021				
Non-derivative financial assets¹	33,372	6,422	380	–
Non-derivative financial liabilities	3,119	–	–	–
Derivative notional contract amount	81,944	–	–	–
At 31 December 2020				
Non-derivative financial assets ¹	44,268	11,008	55	205
Non-derivative financial liabilities	3,101	–	–	–
Derivative notional contract amount	113,010	761	–	–

¹ Gross carrying amount excluding allowances for expected credit losses.

The amounts in the above table relate to the Group's main operating entities and provide an indication of the extent of the Group's exposure to the IBOR benchmarks which are due to be replaced. Amounts are in respect of financial instruments that:

- contractually reference an interest rate benchmark that is planned to transition to an alternative benchmark;
- have a contractual maturity date beyond the date by which the reference interest rate benchmark is expected to cease; and
- are recognised on the Group's consolidated balance sheet.

In March 2021, the administrator of LIBOR, IBA, announced that the publication date of most US dollar LIBOR tenors is extended from 31 December 2021 to 30 June 2023. Publication of one-week and two-month tenors will cease after 31 December 2021. This change reduce the amounts presented at 31 December 2021 in the above table as some financial instruments included at 31 December 2020 will reach their contractual maturity date prior to the extended publication dates. Comparative data have not been re-presented.

Financial crime risk environment

(unaudited)

Financial institutions remain under considerable regulatory scrutiny regarding their ability to prevent and detect financial crime. The financial crime threats we faced have continued to evolve, often in tandem with broader geopolitical socioeconomic and technological shifts across our markets, leading to challenges such as managing conflicting laws and approaches to legal and regulatory regimes.

Financial crime risk evolved during the COVID-19 pandemic, notably with the manifestation of fraud risks linked to the economic slowdown and the resulting deployment of government relief measures. The accelerated digitisation of financial services has fostered significant changes to the payments ecosystem, including a multiplicity of providers and new payment mechanisms, not all of which are subject to the same level of regulatory scrutiny or regulations as financial institutions. This is presenting increasing challenges to the industry in terms of maintaining required levels of transparency, notably where institutions serve as intermediaries. Developments around digital assets and currencies, notably the role of stablecoins and central bank digital currencies, have continued at pace, with an increasing regulatory and enforcement focus on financial crimes linked to these types of assets.

Expectations with respect to intersection of ESG issues and financial crime as our organisation, customers and suppliers transition to net zero, are increasing, not least with respect to potential 'greenwashing'. Companies also face as a heightened regulatory focus on both human rights issues and environmental crimes, from a financial crime perspective. We also continue to face increasing challenges presented by national data privacy requirements, which may affect our ability to manage financial crime risks holistically and effectively.

Mitigating actions

- We are strengthening our fraud and surveillance controls, and investing in next generation capabilities to fight financial crime through the application of advanced analytics and artificial intelligence.
- We are looking at the impact of a rapidly changing payments ecosystem to ensure our financial crime controls remain appropriate for changes in customer behaviour and gaps in regulatory coverage, including the development of procedures and controls to manage the risks associated with direct and indirect exposure to digital assets and currencies.
- We are assessing our existing policies and control framework to ensure that developments in the ESG space are considered and the risks mitigated.
- We work with the relevant jurisdictions to address data privacy challenges to help enable effective management of financial crime risk.
- We work closely with our regulators and engage in public-private partnerships, playing an active role in shaping the industry's financial crime controls for the future, notably with respect to the enhanced, and transparent, use of technology.

Risks related to COVID-19

Despite the successful roll-out of vaccines around the world, the COVID-19 pandemic and its effect on the global economy have continued to impact our customers and organisation. The pandemic necessitated governments to respond at unprecedented levels to protect public health, and to support local economies and livelihoods. The resulting government support measures and restrictions created additional challenges, given the rapid pace of change and significant operational demands. Renewed outbreaks,

particularly those resulting from the emergence of variants of the virus, emphasise the ongoing threat of COVID-19 and could result in significant further tightening of government restrictions.

Hong Kong Government has deployed extensive measures to support local populations.

We continue to support our personal and business customers through market-specific measures initiated during the COVID-19 pandemic, and by supporting Hong Kong government schemes that focus on the parts of the economy most impacted by the pandemic. These measures have been well received and we remain responsive to our customers' changing needs.

The rapid introduction and varying nature of the Government support schemes introduced throughout the COVID-19 pandemic has led to increased operational risks, including complex conduct considerations, increased reputational risk and increased risk of fraud. These risks are likely to be heightened further as and when those Government support schemes are unwound.

The impact of the pandemic on the long-term prospects of businesses in the most vulnerable sectors of the economy – such as retail, hospitality, travel and commercial real estate – remains uncertain and may lead to significant Expected Credit Loss ('ECL') charges on specific exposures, which may not be fully captured in ECL estimates. In addition, in times of stress, fraudulent activity is often more prevalent, leading to potentially significant ECL charges or operational losses.

As economic conditions improve, and government support measures come to an end, there is a risk that the outputs of HKFRS 9 models may have a tendency to underestimate loan losses. To help mitigate this risk, model outputs and management adjustments are closely monitored and independently reviewed for reliability and appropriateness.

As a result of COVID-19, business continuity plans have been successfully implemented and the majority of service level agreements have been maintained. We have not experienced any major impacts to the supply chains from our third-party service providers due to COVID-19. The risk of damage or theft to our physical assets or criminal injury to our employees remains unchanged, with no significant incidents impacting our buildings or staff. Exceptional handling to ensure the continuity of critical customer services are being documented through governance.

Despite the ongoing economic recovery, significant uncertainties remain in assessing the duration and impact of the COVID-19 pandemic, including whether any subsequent outbreaks result in a reimposition of government restrictions. There is a risk that economic activity remains below pre-pandemic levels for a prolonged period increasing inequality across markets, and it will likely be some time before societies return to pre-pandemic levels of social interactions.

We continue to monitor the situation closely, and given the novel and prolonged nature of the pandemic, additional mitigating actions may be required.

Climate related risks

Overview

One of the most significant risks that global economy face today relates to climate change. It is widely recognised that continued emission of greenhouse gases will cause further global warming and this warming could lead to damaging economic and social consequences. Internationally, central banks as well as regulatory bodies demonstrate growing awareness and commitment to tackle the challenge collectively. There are expectations on the financial sector to mobilise climate finance to support the transition to low-carbon economy.

We support the goals of the Paris Agreement. We are strengthening our risk management capabilities to address Climate Risks. In accordance with HSBC Group's guidelines for climate sensitive sectors, we will manage our credit exposure to these industries and support our customers in their transition to a low-carbon economy.

Impacts of climate-related risks

Climate-related risks may be divided into two major categories: (1) risk related to the transition into a lower-carbon economy and (2) risk related to the physical impact of climate change. Transitioning to a lower-carbon economy may lead to extensive policy, legal, regulatory, market and technological change. Physical risk relates to the physical impacts of severe climate events such as flooding and drought; and the long term shift in climate pattern.

These have the potential to cause both financial and non-financial impacts to banks as well as their customers. Financial impacts could materialise if transition and physical risks impact the ability of borrowers to repay their loans. Non-financial impacts could materialise if bank's own assets or operations are impacted by extreme weather or chronic changes in weather patterns or as a result of business decisions to achieve climate ambition.

Key risk management processes

Our approach to climate risk management aligns to HSBC's group-wide risk management framework and three lines of defence model to ensure robust oversight of climate risk. The financial and non-financial impacts imposed by climate risk are addressed by integrating climate risk measures into the existing supporting risk policies, processes and controls.

We continue to evolve our risk appetite to reflect the latest risks from climate change and international standards, setting out the measures we intend to take to support our climate ambition and our commitments to regulators, investors and stakeholders.

Our Environmental, Social and Governance ('ESG') and risk management teams regularly meet, and engage various stakeholders when needed, to review our climate risk management strategy and roadmap. Progress/issues for escalation relating to climate risk will be regularly updated at ESG Steering Committee to ensure senior management oversight.

Key development in 2021

To ensure we meet the growing climate risk related expectations from our regulators, investors and customers; and align with industry peers, we engaged external consultant to conduct thorough review and benchmarking exercise; and developed a roadmap specific to climate risk management to guide our actions towards international standard and market best practice.

A dedicated Climate Risk Working Group, led by Chief Risk Officer, is newly established in our Risk function to support the implementation of our climate change strategy. The workgroup will not only establish climate-related risk governance framework, but also provide management oversight on the resolution of climate risk related agendas.

To establish foundation for climate change-related governance, in September 2021, Climate Risk Programme Training was organised for our EXCO and Board members to assume additional responsibility and exercise board level oversight.

Risk

Our material banking and insurance risks

The material risk types associated with our banking and insurance manufacturing operations are described in the following tables.

Description of risks – banking operations

(audited)

Risks	Arising from	Measurement, monitoring and management of risk
<i>Credit risk</i>		
Credit risk is the risk of financial loss if a customer or counterparty fails to meet an obligation under a contract.	Credit risk arises principally from direct lending, trade finance and leasing business, but also from certain other products such as guarantees and derivatives.	Credit risk is: <ul style="list-style-type: none"> – measured as the amount which could be lost if a customer or counterparty fails to make repayments; – monitored within limits, approved by individuals within a framework of delegated authorities; and – managed through a robust risk control framework which outlines clear and consistent policies, principles and guidance for risk managers.
<i>Treasury risk</i>		
Treasury risk is the risk of having insufficient capital, liquidity or funding resources to meet financial obligations and satisfy regulatory requirements, including the risk of adverse impact on earnings or capital due to structural foreign exchange exposures and changes in market interest rates, and including the financial risks arising from historic and current provision of pensions and other post-employment benefits to staff and their dependants.	Treasury risk arises from changes to the respective resources and risk profiles driven by customer behaviour, management decisions, or pension plan fiduciary decisions. It also arises from the external environment, including changes to market parameters such as interest rates or foreign exchange rates, together with updates to the regulatory requirements.	Treasury risk is: <ul style="list-style-type: none"> – measured through risk appetite and more granular limits, set to provide an early warning of increasing risk, minimum ratios of relevant regulatory metrics, and metrics to monitor the key risk drivers impacting treasury resources; – monitored and projected against appetites and by using operating plans based on strategic objectives together with stress and scenario testing; and – managed through control of resources in conjunction with risk profiles, strategic objectives and cash flows.
<i>Market risk</i>		
Market risk is the risk that movements in market factors, such as foreign exchange rates, interest rates, credit spreads, equity prices and commodity prices, will reduce our income or the value of our portfolios.	Exposure to market risk is separated into two portfolios: trading and non-trading. Market risk exposures arising from our insurance operations are discussed in 'Insurance manufacturing operation risk' section.	Market risk is: <ul style="list-style-type: none"> – measured using sensitivities, value at risk ('VaR') and stress testing, giving a detailed picture of potential gains and losses for a range of market movements and scenarios, as well as tail risks over specified time horizons; – monitored using VaR, stress testing and other measures; and – managed using risk limits approved by Chief Risk Officer. These limits are allocated across the Group's legal entities and business lines.
<i>Resilience risk</i>		
Resilience risk is the risk that we are unable to provide critical services to our customers, affiliates and counterparties as a result of sustained and significant operational disruption.	Resilience risk arises from failures or inadequacies in processes, people, systems or external events.	Resilience risk is: <ul style="list-style-type: none"> – measured through a range of metrics with defined maximum acceptable impact tolerances, and against our agreed risk appetite; – monitored through oversight of enterprise processes, risks, controls and strategic change programmes; and – managed by continual monitoring and thematic reviews.

Risks	Arising from	Measurement, monitoring and management of risk
<i>Regulatory compliance risk</i>		
Regulatory compliance risk is the risk that we fail to observe the letter and spirit of all relevant laws, codes, rules, regulations and standards of good market practice, and incur fines and penalties and suffer damage to our business as a consequence.	Regulatory compliance risk arises from the risks associated with breaching our duty to our customers and other counterparties, inappropriate market conduct and breaching other regulatory requirements.	Regulatory compliance risk is: <ul style="list-style-type: none"> – measured by reference to identified metrics, incident assessments, regulatory feedback and the judgement and assessment of our Regulatory Compliance teams; – monitored against the first line of defence risk and control assessments, the results of the monitoring and control assurance activities of the second line of defence functions, and the results of internal and external audits and regulatory inspections; and – managed by establishing and communicating appropriate policies and procedures, training employees in them, and monitoring activity to assure their observance. Proactive risk control and/or remediation work is undertaken where required.
<i>Financial crime risk</i>		
Financial crime risk is the risk of knowingly or unknowingly help parties to commit or to further illegal activity through the Group, including money laundering, fraud, bribery and corruption, tax evasion, sanctions breaches, and terrorist and proliferation financing.	Financial crime risk arises from day-to-day banking operations involving customers, third parties and employees. Exceptional circumstances which impact day-to-day operations may additionally increase financial crime risk.	Financial crime risk is: <ul style="list-style-type: none"> – measured by reference to risk appetite, identified metrics, incident assessments, regulatory feedback and the judgement and assessment of our financial crime risk teams; – monitored against the first line of defence risk and control assessments, the results of the monitoring and control assurance activities of the second line of defence functions, and the results of internal and external audits and regulatory inspections; and – managed by establishing and communicating appropriate policies and procedures, training employees in them, and monitoring activity to help ensure their observance. Proactive risk control and/or remediation work is undertaken where required.
<i>Model risk</i>		
Model risk is the potential for adverse consequences from business decisions informed by models, which can be exacerbated by errors in methodology, design or the way they are used.	Model risk arises in both financial and non-financial contexts whenever business decision making includes reliance on models.	Model risk is: <ul style="list-style-type: none"> – measured by reference to model performance tracking and the output of detailed technical reviews, with key metrics including model review statuses and findings; – monitored against model risk appetite statements, insight from the independent review function, feedback from internal and external audits, and regulatory reviews; and – managed by creating and communicating appropriate policies, procedures and guidance, training colleagues in their application, and supervising their adoption to ensure operational effectiveness.

Risk

Description of risks – insurance manufacturing operations

(audited)

Our insurance manufacturing subsidiary is separately regulated from our banking operations. Risks in the insurance entities are managed using methodologies and processes appropriate to insurance manufacturing operations, but remain subject to oversight at Group level. Our insurance operations are also subject to some of the same risks as our banking operations, which are covered by the Group's respective risk management processes.

Risks	Arising from	Measurement, monitoring and management of risk
Insurance risk		
Insurance risk is the risk that, over time, the cost of acquiring and administering an insurance contract, and paying claims and benefits may exceed the total amount of premiums received and investment income.	The cost of claims and benefits can be influenced by many factors, including mortality and morbidity experience, as well as lapse and surrender rates.	Insurance risk is: <ul style="list-style-type: none">– measured in terms of life insurance liabilities and economic capital allocated to insurance underwriting risk;– monitored through a framework of approved limits and delegated authorities; and– managed through a robust risk control framework which outlines clear and consistent policies, principles and guidance. This includes using product design, underwriting, reinsurance and claims-handling procedures.
Financial risk		
Our ability to effectively match the liabilities arising under insurance contracts with the asset portfolios that back them is contingent on the management of financial risks and the extent to which these risks are borne by the policyholders.	Exposure to financial risks arises from: <ul style="list-style-type: none">– market risk of changes in the fair values of financial assets or their future cash flows;– credit risk; and– liquidity risk of entities being unable to make payments to policyholders as they fall due.	Financial risk is: <ul style="list-style-type: none">– measured separately for each type of risk:<ul style="list-style-type: none">– market risk is measured in terms of economic capital, internal metrics and fluctuations in key financial variables;– credit risk is measured in terms of economic capital and the amount that could be lost if a counterparty fails to make repayments; and– liquidity risk is measured in terms of internal metrics including stressed operational cash flow projections;– monitored through a framework of approved limits and delegated authorities; and– managed through a robust risk control framework, which outlines clear and consistent policies, principles and guidance. This includes using product design, asset liability matching and bonus rates.

The following information describes the Group's management and control of risks, in particular, those associated with its use of financial instruments ('financial risks'). Major types of risks to which the Group is exposed include credit risk, liquidity risk, market risk and insurance risk.

(a) Credit Risk

Overview

Credit risk is the risk of financial loss if a customer or counterparty fails to meet an obligation under a contract. Credit risk arises principally from direct lending, trade finance and leasing business, but also from other products such as guarantees and credit derivatives.

Credit risk management

(audited)

Key developments in 2021

There were no material changes to the policies and practices for the management of credit risk in 2021. We continued to apply the requirements of HKFRS 9 'Financial Instruments' within Credit Risk.

Due to the unique market conditions in the COVID-19 outbreak, we expanded operational practices to provide short-term support to customers under the current policy framework. For further details of market-specific measures to support our personal and business customers, see below sections.

(a) Credit Risk

Credit risk management continued

(audited)

Governance and structure

We have established credit risk management and related HKFRS 9 processes throughout the Group. We continue to actively assess the impact of economic developments on specific customers, customer segments or portfolios. As credit conditions change, we take mitigating action, including the revision of risk appetites or limits and tenors, as appropriate. In addition, we continue to evaluate the terms under which we provide credit facilities within the context of individual customer requirements, the quality of the relationship, local regulatory requirements, market practices and our local market position.

Credit risk sub-function

(audited)

With the delegation from the Board, credit approval authorities are delegated by the Executive Committee to the Chief Executive together with the authority to sub-delegate them. The Credit Risk sub-function is responsible for the key policies and processes for managing credit risk, which include formulating the Group's credit policies and risk rating frameworks, guiding the Group's appetite for credit risk exposures, undertaking independent reviews and objective assessment of credit risk, and monitoring performance and management of portfolios.

The principal objectives of our credit risk management are:

- to maintain across the Group a strong culture of responsible lending, and robust risk policies and control frameworks;
- to both partner and challenge our businesses in defining, implementing and continually re-evaluating our risk appetite under actual and scenario conditions; and
- to ensure there is independent, expert scrutiny of credit risks, their costs and their mitigation.

Key risk management processes

HKFRS 9 'Financial Instruments' process

The HKFRS 9 process comprises three main areas: modelling and data; implementation; and governance.

Modelling and data

We have established modelling and data processes in various geographies, which are subject to internal model risk governance including independent review of significant model developments.

Implementation

A centralised impairment engine performs the expected credit loss ('ECL') calculation using data, which is subject to a number of validation checks and enhancements, from a variety of client, finance and risk systems. Where possible, these checks and processes are performed in a globally consistent and centralised manner.

Governance

Management review forums are established in order to review and approve the impairment results. Management review forums have representatives from Credit Risk and Finance. The approvals are reported up to the Impairment Committee for final approval of the Group's ECL for the period. Required members of the Impairment Committee are the heads of Wholesale Credit, Market Risk, and Wealth and Personal Banking Risk, as well as the Chief Risk Officer, the Chief Financial Officer and the Chief Accounting Officer.

Concentration of exposure

(audited)

Concentrations of credit risk arise when a number of counterparties or exposures have comparable economic characteristics, or such counterparties are engaged in similar activities or operate in the same geographical areas or industry sectors so that their collective ability to meet contractual obligations is uniformly affected by changes in economic, political or other conditions. We use a number of controls and measures to minimise undue concentration of exposure in our portfolios across industries, countries and businesses. These include portfolio and counterparty limits, approval and review controls, and stress testing.

Credit quality of financial instruments

(audited)

Our risk rating system facilitates the internal ratings-based approach under the Basel framework adopted by the Group to support the calculation of our minimum credit regulatory capital requirement.

The five credit quality classifications each encompass a range of granular internal credit rating grades assigned to wholesale and retail lending businesses, and the external ratings attributed by external agencies to debt securities.

(a) Credit Risk

Credit risk management continued

(audited)

Key risk management processes continued

Credit quality of financial instruments continued

(audited)

For debt securities and certain other financial instruments, external ratings have been aligned to the five quality classifications based upon the mapping of related customer risk rating ('CRR') to external credit rating.

Retail lending

Retail lending credit quality is based on a 12-month probability-weighted PD.

Wholesale lending

The CRR 10-grade scale summarises a more granular underlying 23-grade scale of obligor probability of default ('PD'). All corporate customers are rated using the 10- or 23-grade scale, depending on the degree of sophistication of the Basel approach adopted for the exposure.

Each CRR band is associated with an external rating grade by reference to long-run default rates for that grade, represented by the average of issuer-weighted historical default rates. This mapping between internal and external ratings is indicative and may vary over time.

	Sovereign debt securities and bills	Other debt securities and bills	Wholesale lending		Retail lending	
Credit quality classification ^{1,2}	External credit rating	External credit rating	Internal credit rating	12-month Basel probability of default %	Internal credit rating	12-month probability-weighted PD %
Strong	BBB and above	A- and above	CRR 1 to CRR 2	0 – 0.169	Band 1 and 2	0 – 0.500
Good	BBB- to BB	BBB+ to BBB-	CRR3	0.170 – 0.740	Band 3	0.501 – 1.500
Satisfactory	BB- to B and unrated	BB+ to B and unrated	CRR 4 to CRR 5	0.741 – 4.914	Band 4 and 5	1.501 – 20.000
Sub-standard	B- to C	B- to C	CRR 6 to CRR 8	4.915 – 99.999	Band 6	20.001 – 99.999
Credit-impaired	Default	Default	CRR 9 to CRR 10	100	Band 7	100

¹ Customer risk rating ('CRR').

² 12-month point-in-time ('PIT') probability-weighted probability of default ('PD').

Quality classification definitions:

- Strong exposures demonstrate a strong capacity to meet financial commitments, with negligible or low probability of default and/or low levels of expected loss.
- Good exposures require closer monitoring and demonstrate a good capacity to meet financial commitments, with low default risk.
- Satisfactory exposures require closer monitoring and demonstrate an average-to-fair capacity to meet financial commitments, with moderate default risk.
- Sub-standard exposures require varying degrees of special attention and default risk is of greater concern.
- Credit-impaired exposures have been assessed as described on note 2(j) on the Consolidated Financial Statements.

Renegotiated loans and forbearance

(audited)

Forbearance refers to modified contractual terms and conditions or 'concessions' granted to a customer experiencing or about to experience credit related financial difficulty so that the customer is better positioned to service its debt. Once a concession has been classified as Forbearance, it must be reported as 'Renegotiated Loans'.

For details of our policy on derecognised renegotiated loans, see note 2(j) on the Consolidated Financial Statements.

(a) Credit Risk

Credit risk management continued (audited)

Key risk management processes continued

Credit quality of renegotiated loans

On execution of a renegotiation, the loan will also be classified as credit-impaired if it is not already so classified. In wholesale lending, all facilities with a customer, including loans that have not been modified, are considered credit-impaired following the identification of a renegotiated loan.

Wholesale renegotiated loans are classified as credit-impaired until there is sufficient evidence to demonstrate a significant reduction in the risk of non-payment of future cash flows, observed over a minimum one-year period, and there are no other indicators of impairment. Personal renegotiated loans are deemed to remain credit-impaired until repayment or derecognition.

Loans that have been identified as renegotiated retain this designation until (1) maturity; or (2) derecognition; or (3) two-year observation period has been fulfilled after the customers are no longer classified as credit-impaired with no past due over 30 days.

Renegotiated loans and recognition of expected credit losses (audited)

For retail lending, unsecured renegotiated loans are generally segmented from other parts of the loan portfolio. Renegotiated expected credit loss assessments reflect the higher rates of losses typically encountered with renegotiated loans. For wholesale lending, renegotiated loans are typically assessed individually. Credit risk ratings are intrinsic to the impairment assessments. The individual impairment assessment takes into account the higher risk of the future non-payment inherent in renegotiated loans.

Impairment assessment

(audited)

For details of our impairment policies on loans and advances and financial investments, see note 2(j) on the Consolidated Financial Statements.

Write-off of loans and advances

(audited)

For details of our policy on the write-off of loans and advances, see note 2(j) on the Consolidated Financial Statements.

Unsecured personal facilities, including credit cards, are generally written off at 180 days contractually delinquent. Write-off periods may be earlier, e.g. bankruptcy.

For secured personal facilities, write-off should occur upon repossession of collateral, receipt of proceeds via settlement, or determination that recovery of the collateral will not be pursued. In circumstances where the net realisable value of any collateral has been determined and there is no reasonable expectation of further recovery, write off may be earlier.

Any secured assets maintained on the balance sheet beyond 60 months of consecutive delinquency-driven default require additional monitoring and review to assess the prospect of recovery.

The write-off of wholesale facilities are conducted when all recovery actions (including legal proceedings) have been exhausted with remote chance of further recovery.

(a) Credit Risk

Summary of credit risk

(audited)

The following tables analyse the financial instruments to which the impairment requirements of HKFRS 9 are applied and the related allowance for ECL.

Summary of financial instruments to which the impairment requirements in HKFRS 9 are applied

	At 31 December 2021		At 31 December 2020	
	Gross carrying/ nominal amount	Allowance for ECL ¹	Gross carrying/ nominal amount	Allowance for ECL ¹
Loans and advances to customers at amortised cost	1,004,325	(6,928)	949,954	(5,180)
Placings with and advances to banks at amortised cost	72,494	(1)	44,357	–
Other financial assets measured at amortised costs:	214,623	(167)	188,872	(187)
– cash and balances at central banks	16,896	–	11,226	–
– reverse repurchase agreements – non-trading	18,821	–	13,360	–
– financial investments	141,380	(153)	134,997	(173)
– other assets ²	37,526	(14)	29,289	(14)
Total gross carrying amount on balance sheet	1,291,442	(7,096)	1,183,183	(5,367)
Loans and other credit related commitments	365,054	(162)	356,776	(163)
Financial guarantee and similar contracts	2,431	(3)	3,024	(18)
Total nominal amount off balance sheet ³	367,485	(165)	359,800	(181)
Total	1,658,927	(7,261)	1,542,983	(5,548)
	Fair value	Memorandum Allowance for ECL	Fair value	Memorandum Allowance for ECL
Debt instruments measured at Fair Value through Other Comprehensive Income ('FVOCI') ⁴	353,892	(9)	412,845	(9)

¹ For retail unsecured revolving facilities, e.g. overdrafts and credit cards, the total ECL is recognised against the financial asset unless the total ECL exceeds the gross carrying amount of the financial asset, in which case the ECL is recognised against the loan commitments.

² Includes only those financial instruments which are subject to the impairment requirements of HKFRS 9. 'Other assets' as presented within the Consolidated Balance Sheet includes both financial and non-financial assets.

³ The figure does not include some loan commitments and financial guarantee contracts not subject to impairment requirements under HKFRS 9. As such, the amount does not agree with the figure shown in note 45 of the Consolidated Financial Statements, which represents the maximum amount at risk should the contracts be fully drawn upon and clients default.

⁴ Debt instruments measured at FVOCI continue to be measured at fair value with the allowance for ECL as a memorandum item. Change in ECL is recognised in 'Change in expected credit losses and other credit impairment charges' in Consolidated Income Statement.

(a) Credit Risk

The following table provides an overview of the Group's credit risk by stage and the associated ECL coverage. The financial assets recorded in each stage have the following characteristics:

Stage 1: These financial assets are unimpaired and without significant increase in credit risk on which a 12-month allowance for ECL is recognised.

Stage 2: A significant increase in credit risk has been experienced on these financial assets since initial recognition for which a lifetime ECL is recognised.

Stage 3: There is objective evidence of impairment and the financial assets are therefore considered to be in default or otherwise credit-impaired on which a lifetime ECL is recognised.

POCI: Financial assets that are purchased or originated at a deep discount are seen to reflect the incurred credit losses on which a lifetime ECL is recognised.

Summary of credit risk (excluding debt instruments measured at FVOCI) by stage distribution and ECL coverage

(audited)

	Gross carrying/nominal amount ¹					Allowance for ECL					ECL coverage %				
	Stage 1	Stage 2	Stage 3	POCI ²	Total	Stage 1	Stage 2	Stage 3	POCI	Total	Stage 1	Stage 2	Stage 3	POCI	Total
Loans and advances to customers at amortised cost:	852,149	141,747	9,457	972	1,004,325	(762)	(3,466)	(2,700)	–	(6,928)	0.09%	2.45%	28.55%	0.00%	0.69%
– personal	358,508	15,358	858	–	374,724	(291)	(833)	(157)	–	(1,281)	0.08%	5.42%	18.30%	N/A	0.34%
– corporate and commercial	469,431	124,606	8,495	972	603,504	(350)	(2,621)	(2,515)	–	(5,486)	0.07%	2.10%	29.61%	0.00%	0.91%
– non-bank financial institutions	24,210	1,783	104	–	26,097	(121)	(12)	(28)	–	(161)	0.50%	0.67%	26.92%	N/A	0.62%
Placements with and advances to banks at amortised cost	72,311	183	–	–	72,494	(1)	–	–	–	(1)	0.00%	0.00%	N/A	N/A	0.00%
Other financial assets measured at amortised cost	210,364	4,259	–	–	214,623	(99)	(68)	–	–	(167)	0.05%	1.60%	N/A	N/A	0.08%
Loans and other credit-related commitments:	357,016	8,038	–	–	365,054	(57)	(105)	–	–	(162)	0.02%	1.31%	N/A	N/A	0.04%
– personal	243,639	–	–	–	243,639	–	–	–	–	–	0.00%	N/A	N/A	N/A	0.00%
– corporate and commercial	98,530	7,035	–	–	105,565	(53)	(105)	–	–	(158)	0.05%	1.49%	N/A	N/A	0.15%
– non-bank financial institutions	14,847	1,003	–	–	15,850	(4)	–	–	–	(4)	0.03%	0.00%	N/A	N/A	0.03%
Financial guarantee and similar contracts:	2,283	148	–	–	2,431	(2)	(1)	–	–	(3)	0.09%	0.68%	N/A	N/A	0.12%
– personal	8	–	–	–	8	–	–	–	–	–	0.00%	N/A	N/A	N/A	0.00%
– corporate and commercial	1,885	148	–	–	2,033	(2)	(1)	–	–	(3)	0.11%	0.68%	N/A	N/A	0.15%
– non-bank financial institutions	390	–	–	–	390	–	–	–	–	–	0.00%	N/A	N/A	N/A	0.00%
At 31 December 2021	1,494,123	154,375	9,457	972	1,658,927	(921)	(3,640)	(2,700)	–	(7,261)	0.06%	2.36%	28.55%	0.00%	0.44%

¹ Represents the maximum amount at risk should the contracts be fully drawn upon and clients default.

² Purchased or originated credit-impaired ('POCI').

Unless identified at an earlier stage, all financial assets are deemed to have suffered a significant increase in credit risk when they are 30 days past due ('DPD') and are transferred from stage 1 to stage 2. The disclosure below presents the aging of stage 2 loans and advances to customers by those less than 30 and greater than 30 days past due and therefore presents those amounts classified as stage 2 due to aging (30 days past due) and those identified at an earlier stage (less than 30 days past due).

(a) Credit Risk

Summary of credit risk (excluding debt instruments measured at FVOCI) by stage distribution and ECL coverage continued

(audited)

Stage 2 days past due analysis for loans and advances to customers

Loans and advances to customers at amortised cost	At 31 December 2021											
	Gross carrying amount				Allowance for ECL				ECL coverage %			
	Stage 2	Of which: Up-to-date	Of which: 1 to 29 DPD ¹	Of which: 30 and > DPD	Stage 2	Of which: Up-to-date	Of which: 1 to 29 DPD	Of which: 30 and > DPD	Stage 2	Of which: Up-to-date	Of which: 1 to 29 DPD	Of which: 30 and > DPD
– personal	15,358	13,430	1,391	537	(833)	(711)	(54)	(68)	5.42%	5.29%	3.88%	12.66%
– corporate and commercial	124,606	124,358	243	5	(2,621)	(2,618)	(3)	–	2.10%	2.11%	1.23%	0.00%
– non-bank financial institutions	1,783	1,783	–	–	(12)	(12)	–	–	0.67%	0.67%	N/A	N/A
	141,747	139,571	1,634	542	(3,466)	(3,341)	(57)	(68)	2.45%	2.39%	3.49%	12.55%

¹ Days past due ('DPD').

	Gross carrying/nominal amount ¹					Allowance for ECL					ECL coverage %				
	Stage 1	Stage 2	Stage 3	POCI ²	Total	Stage 1	Stage 2	Stage 3	POCI	Total	Stage 1	Stage 2	Stage 3	POCI	Total
Loans and advances to customers at amortised cost:	814,146	130,084	5,723	1	949,954	(1,315)	(1,821)	(2,044)	–	(5,180)	0.16%	1.40%	35.72%	0.00%	0.55%
– personal	339,299	12,282	984	–	352,565	(557)	(748)	(220)	–	(1,525)	0.16%	6.09%	22.36%	N/A	0.43%
– corporate and commercial	455,414	115,640	4,579	1	575,634	(695)	(1,065)	(1,782)	–	(3,542)	0.15%	0.92%	38.92%	0.00%	0.62%
– non-bank financial institutions	19,433	2,162	160	–	21,755	(63)	(8)	(42)	–	(113)	0.32%	0.37%	26.25%	N/A	0.52%
Placings with and advances to banks at amortised cost	43,919	438	–	–	44,357	–	–	–	–	–	0.00%	0.00%	N/A	N/A	0.00%
Other financial assets measured at amortised cost	184,344	4,528	–	–	188,872	(133)	(54)	–	–	(187)	0.07%	1.19%	N/A	N/A	0.10%
Loans and other credit-related commitments:	352,241	4,535	–	–	356,776	(90)	(73)	–	–	(163)	0.03%	1.61%	N/A	N/A	0.05%
– personal	241,420	–	–	–	241,420	–	–	–	–	–	0.00%	N/A	N/A	N/A	0.00%
– corporate and commercial	98,795	4,535	–	–	103,330	(87)	(73)	–	–	(160)	0.09%	1.61%	N/A	N/A	0.15%
– non-bank financial institutions	12,026	–	–	–	12,026	(3)	–	–	–	(3)	0.02%	N/A	N/A	N/A	0.02%
Financial guarantee and similar contracts:	2,702	322	–	–	3,024	(16)	(2)	–	–	(18)	0.59%	0.62%	N/A	N/A	0.60%
– personal	7	–	–	–	7	–	–	–	–	–	0.00%	N/A	N/A	N/A	0.00%
– corporate and commercial	2,695	322	–	–	3,017	(16)	(2)	–	–	(18)	0.59%	0.62%	N/A	N/A	0.60%
– non-bank financial institutions	–	–	–	–	–	–	–	–	–	–	N/A	N/A	N/A	N/A	N/A
At 31 December 2020	1,397,352	139,907	5,723	1	1,542,983	(1,554)	(1,950)	(2,044)	–	(5,548)	0.11%	1.39%	35.72%	0.00%	0.36%

¹ Represents the maximum amount at risk should the contracts be fully drawn upon and clients default.

² Purchased or originated credit-impaired ('POCI').

Unless identified at an earlier stage, all financial assets are deemed to have suffered a significant increase in credit risk when they are 30 days past due ('DPD') and are transferred from stage 1 to stage 2. The disclosure below presents the aging of stage 2 loans and advances to customers by those less than 30 and greater than 30 days past due and therefore presents those amounts classified as stage 2 due to aging (30 days past due) and those identified at an earlier stage (less than 30 days past due).

(a) Credit Risk

Summary of credit risk (excluding debt instruments measured at FVOCI) by stage distribution and ECL coverage continued

(audited)

Stage 2 days past due analysis for loans and advances to customers

Loans and advances to customers at amortised cost	At 31 December 2020											
	Gross carrying amount				Allowance for ECL				ECL coverage %			
	Stage 2	Of which: Up-to-date	Of which: 1 to 29 DPD ¹	Of which: 30 and > DPD	Stage 2	Of which: Up-to-date	Of which: 1 to 29 DPD	Of which: 30 and > DPD	Stage 2	Of which: Up-to-date	Of which: 1 to 29 DPD	Of which: 30 and > DPD
– personal	12,282	10,418	1,240	624	(748)	(645)	(48)	(55)	6.09%	6.19%	3.87%	8.81%
– corporate and commercial	115,640	115,170	374	96	(1,065)	(1,005)	(20)	(40)	0.92%	0.87%	5.35%	41.67%
– non-bank financial institutions	2,162	2,161	1	–	(8)	(8)	–	–	0.37%	0.37%	0.00%	N/A
	130,084	127,749	1,615	720	(1,821)	(1,658)	(68)	(95)	1.40%	1.30%	4.21%	13.19%

¹ Days past due ('DPD').

(i) Maximum exposure to credit risk before collateral held or other credit enhancements

(audited)

Our credit exposure is spread across a broad range of asset classes, including derivatives, trading assets, loans and advances to customers, loans and advances to banks and financial investments.

The following table presents the maximum exposure to credit risk from balance sheet and off-balance sheet financial instruments, before taking account of any collateral held or other credit enhancements (unless such credit enhancements meet accounting offsetting requirements). For financial assets recognised on the balance sheet, the maximum exposure to credit risk equals their carrying amount; for financial guarantees and similar contracts granted, it is the maximum amount that we would have to pay if the guarantees were called upon. For loan commitments and other credit-related commitments, it is generally the full amount of the committed facilities.

	2021	2020
Cash and balances at central banks	16,896	11,226
Trading assets	47,392	37,072
Derivative financial instruments	13,224	17,181
Financial assets designated and otherwise mandatorily measured at fair value through profit or loss	1,041	1,284
Reverse repurchase agreements – non-trading	18,821	13,360
Placings with and advances to banks	72,493	44,357
Loans and advances to customers	997,397	944,774
Financial investments	495,119	547,669
Other assets	37,533	29,449
Financial guarantees and other credit related contingent liabilities ¹	28,864	19,773
Loan commitments and other credit related commitments	649,961	556,503
	2,378,741	2,222,648

¹ Performance and other guarantees were included.

(a) Credit Risk

(ii) Measurement uncertainty and sensitivity analysis of ECL estimates

(audited)

Despite a broad recovery in economic conditions during 2021, ECL estimates continue to be subject to a high degree of uncertainty, and management judgements and estimates continue to reflect a degree of caution, both in the selection of economic scenarios and their weightings, and through judgmental adjustments.

The recognition and measurement of ECL involves the use of significant judgement and estimation. We form multiple economic scenarios based on economic forecasts, apply these assumptions to credit risk models to estimate future credit losses, and probability-weight the results to determine an unbiased ECL estimate. Management judgmental adjustments are used to address late-breaking events, data and model limitations, and expert credit judgements.

Methodology

Four economic scenarios have been used to capture the current economic environment and to articulate management's view of the range of potential outcomes. Scenarios produced to calculate ECL are aligned to the Group's Top and Emerging Risks.

In Q2 2020, to ensure that the severe risks associated with the pandemic were appropriately captured, management added a fourth, more severe, scenario to use in the measurement of ECL. Starting Q4 2021, the methodology has been adjusted so that the use of four scenarios, of which two are downside scenarios, is the standard approach to ECL calculation.

Three of these scenarios are drawn from consensus forecasts and distributional estimates. The central scenarios deemed the 'most likely' outcome, and usually being assigned the largest probability weighting, while the outer scenarios represent the tails of the distribution which are less likely to occur. The central scenario is created using the average of a panel of external forecasters ('the consensus') while consensus upside and downside scenarios are created with reference to distributions for selected markets that capture forecasters' views of the entire range of outcomes.

In the later years of the scenarios, projections revert to long-term consensus trend expectations. In the consensus outer scenarios, reversion to trend expectations is done mechanically with reference to historically observed quarterly changes in the values of macroeconomic variables.

The fourth scenario, Downside 2, is designed to represent Management's view of severe downside risks. It is a globally consistent, narrative driven, scenario that explores more extreme economic outcomes than those captured by the consensus scenarios. In this scenario, variables do not, by design, revert to long-term trend expectations. They may instead explore alternative states of equilibrium, where economic activity moves permanently away from past trend.

Description of Consensus Economic Scenarios

The economic assumptions presented in this section have been formed internally with reference to external forecasts specifically for the purpose of calculating ECL.

Global economic growth experienced a recovery in 2021, following an unprecedented contraction in 2020. Restrictions to mobility and travel have eased across global markets, aided by the successful roll-out of vaccination programmes. Vaccinations have shown their effectiveness in lowering hospitalisations and deaths enabling economies to re-open. The emergence of new variants that potentially reduce the efficacy of vaccines remains a risk. Economic forecasts are subject to a high degree of uncertainty in the current environment. Risks to the economic outlook are dominated by the progression of the pandemic, vaccine roll-out and the public response. Geopolitical risks also remain significant and include continued differences between the US and China over a range of strategic issues.

The scenarios used to calculate ECL in the Annual Report 2021 are described below.

The consensus Central scenario

The Central scenario features a continued recovery in economic growth in 2022 as activity and employment gradually return to the levels reached prior to the outbreak of COVID-19.

Our Central scenario assumes that the stringent restrictions on activity, imposed across several countries and territories in 2020 and early 2021 are not repeated. The new viral strain, that emerged late in 2021 – Omicron has only a limited impact on the recovery, according to this scenario. Consumer spending and business investment, supported by elevated levels of private sector savings, are expected to drive the economic recovery as fiscal and monetary policy support recedes. Differences across markets in the speed and scale of economic recovery in the Central scenario reflect differences in the progression of the pandemic, different speeds of roll-out of vaccination programmes, national level differences in restrictions imposed and scale of support measures.

(a) Credit Risk

(ii) Measurement uncertainty and sensitivity analysis of ECL estimates continued

(audited)

The consensus Central scenario continued

The key features of our Central scenario are:

- Economic activity across global markets continues to recover. GDP grows at a moderate rate and exceeds pre-pandemic levels across all global markets in 2022.
- Unemployment declines to levels only slightly higher than existed pre-pandemic.
- COVID related fiscal spending recedes in 2022 as fewer restrictions on activity allow fiscal support to be withdrawn. Deficits remain high in several countries as they embark on multi-year investment programmes to support recovery, productivity growth and climate transition.
- Inflation across many of global markets remains elevated through 2022. Supply driven price pressures persist through the first half of 2022 before gradually easing. In subsequent years, inflation quickly converges back towards central bank target rates.
- Policy interest rates in key markets rise gradually over our projection period, in line with economic recovery.

The following table describes key macroeconomic variables and the probabilities assigned in the consensus Central scenario.

Central scenario

	Hong Kong %	Mainland China %
GDP growth rate		
2022: Annual average growth rate	3.1	5.3
2023: Annual average growth rate	2.9	5.4
2024: Annual average growth rate	2.6	5.1
5 years average (2022 – 2026)	2.7	5.1
Unemployment rate		
2022: Annual average growth rate	4.1	3.8
2023: Annual average growth rate	3.6	3.7
2024: Annual average growth rate	3.5	3.8
5 years average (2022 – 2026)	3.6	3.8
House price growth		
2022: Annual average growth rate	3.4	0.3
2023: Annual average growth rate	2.4	4.7
2024: Annual average growth rate	2.0	4.9
5 years average (2022 – 2026)	2.6	3.5
Probability	70	80

The consensus Upside scenario

Compared to the consensus Central scenario, the consensus Upside scenario features a faster recovery in economic activity during the first two years, before converging to long-run trend expectation.

The scenario is consistent with a number of key upside risk themes. These include the orderly and rapid global abatement of COVID-19 via successful containment and ongoing vaccine efficacy; de-escalation of tensions between the US and China and continued support from fiscal and monetary policy.

The following table describes key macroeconomic variables and the probabilities assigned in the consensus Upside scenario.

Consensus Upside scenario best outcome

	Hong Kong %	Mainland China %
GDP growth rate	10.3 (4Q22)	11.8 (4Q22)
Unemployment rate	2.7 (4Q23)	3.5 (1Q23)
House price growth	11.9 (4Q22)	8.2 (4Q22)
Probability	5	5

Note: Extreme point in the consensus Upside is 'best outcome' in the scenario, i.e. highest GDP growth, lowest unemployment rate etc. in first two years of the scenario.

Downside scenarios

The progress of the pandemic and the ongoing public policy response continues to be a key source of risk. Downside scenarios assume that new strains of the virus result in an acceleration in infection rates and increased pressure on public health services, necessitating restrictions on activity. The re-imposition of such restrictions could be assumed to have damaging effect on consumer and business confidence.

Government fiscal programmes in advanced economies in 2020 and 2021 were supported by accommodative actions taken by central banks. These measures have provided households and firms with significant support. An inability or unwillingness to continue with such support or the untimely withdrawal of support present a downside risk to growth.

(a) Credit Risk

(ii) Measurement uncertainty and sensitivity

analysis of ECL estimates continued

(audited)

Downside scenarios continued

While COVID-19 and related risks dominate the economic outlook, geopolitical risks also present a threat. These risks include:

- Continued long-term differences between the US and China, which could affect sentiment and restrict global economic activity.
- The re-emergence of social unrest in Hong Kong.

The consensus Downside scenario

In the consensus Downside scenario, economic recovery is considerably weaker compared to the Central scenario. GDP growth is expected to be lower, unemployment rates rise moderately and asset and commodity prices fall before gradually recovering towards their long-run trend expectation. The scenario is consistent with the key downside risks articulated above. Further outbreaks of COVID-19, coupled with delays in vaccination programmes lead to longer lasting restrictions on economic activity. Other global risks also increase and drive increased risk-aversion in asset markets.

The following table describes key macroeconomic variables and the probabilities assigned in the consensus Downside scenario.

Consensus Downside scenario worst outcome

	Hong Kong %	Mainland China %
GDP growth rate	(1.0) (4Q22)	2.3 (4Q22)
Unemployment rate	5.6 (2Q22)	4.0 (2Q22)
House price growth	(7.9) (4Q22)	(3.7) (2Q22)
Probability	20	10

Note: Extreme point in the consensus Downside is 'worst outcome' in the scenario, i.e. lowest GDP growth, highest unemployment rate etc. in first two years of the scenario.

Downside 2 scenario

The Downside 2 scenario features a deep global recession. In this scenario, new COVID-19 variants emerge that cause infections to rise sharply in 2022, resulting in setbacks to vaccine programmes and the rapid imposition of restrictions on mobility and travel across some countries. The scenario

also assumes governments and central banks are unable to significantly increase fiscal and monetary support, which results in abrupt corrections in labour and asset markets.

The following table describes key macroeconomic variables and the probabilities assigned in the Downside 2 scenario.

Downside 2 scenario worst outcome

	Hong Kong %	Mainland China %
GDP growth rate	(8.2) (4Q22)	(4.8) (4Q22)
Unemployment rate	6.1 (4Q22)	5.4 (4Q23)
House price growth	(17.7) (4Q22)	(24.8) (4Q22)
Probability	5	5

Note: Extreme point in the Downside 2 is 'worst outcome' in the scenario, i.e. lowest GDP growth, highest unemployment rate etc. in first two years of the scenario.

Scenario weighting

In considering economic uncertainty and assigning probabilities to scenarios, management has considered both global and local-specific factors. This has led management to assigning scenario probabilities that are tailored to its view of uncertainty in individual markets.

To inform its view, management has considered the progression and response to the virus in individual markets, the efficacy of vaccine roll-outs, the degree of current and expected future government support and connectivity with other countries. Management has also been guided by the policy response and economic performance through the pandemic, as well as the evidence that economies have adapted as the virus has progressed.

A key consideration in Q4 2021 has been the emergence of the new variant-Omicron-in December 2021. The virulence and severity of the new strain, in addition to the continued efficacy of vaccines against it was unknown when the variant first emerged. Management has therefore determined that uncertainty attached to forecasts has increased and sought to reflect this in scenario weightings.

China's significant capacity to extend policy support to the economy and manage through COVID-19 related disruptions, led management to conclude that the economic outlook for mainland China was the least uncertain of all our top markets. The Central scenario for mainland China has been assigned an 80% probability while a total of 15% has been assigned to the two Downside scenarios. In Hong Kong, the combination of recurrent outbreaks and the other risks outlined above, have led management to assign a 25% weight to the two Downside scenarios.

(a) Credit Risk

(ii) Measurement uncertainty and sensitivity analysis of ECL estimates continued

(audited)

Critical accounting estimates and judgements

The calculation of ECL under HKFRS 9 involves significant judgements, assumptions and estimates. Despite a general recovery in economic conditions during 2021, the level of estimation uncertainty and judgement has remained high during 2021 as a result of the ongoing economic effects of the COVID-19 pandemic and other sources of economic instability, including significant judgements relating to:

- the selection and weighting of economic scenarios, given rapidly changing economic conditions in an unprecedented manner, uncertainty as to the effect of government and central bank support measures designed to alleviate adverse economic impacts, and a wider distribution of economic forecasts than before the pandemic. The key judgements are the length of time over which the economic effects of the pandemic will occur and the speed and shape of recovery. The main factors include the effectiveness of pandemic containment measures, the pace of roll-out and effectiveness of vaccines, and the emergence of new variants of the virus, plus a range of geopolitical uncertainties, which together represent a high degree of estimation uncertainty, particularly in assessing Downside scenarios;
- estimating the economic effects of those scenarios on ECL, where there is no observable historical trend that can be reflected in the models that will accurately represent the effects of the economic changes of the severity and speed brought about by the COVID-19 pandemic and recovery from those conditions. Modelled assumptions and linkages between economic factors and credit losses may underestimate or overestimate ECL in these conditions, and there is significant uncertainty in the estimation of parameters such as collateral values and loss severity;
- the identification of customers experiencing significant increases in credit risk and credit impairment, particularly where those customers have accepted payment deferrals and other reliefs designed to address short-

term liquidity issues given muted default experience to date. The use of segmentation techniques for indicators of significant increases in credit risk involves significant estimation uncertainty; and

- determining the management judgmental adjustments for high-risk and vulnerable sectors, including the higher risk China commercial real estate exposures. The identification of higher risk customers and the estimation of the parameters such as default rate and loss severity involve significant uncertainty.

How economic scenarios are reflected in the calculation of ECL

Models are used to reflect economic scenarios on ECL estimates. As described above, modelled assumptions and linkages based on historical information could not alone produce relevant information under the conditions experienced in 2021, and judgemental adjustments were still required to support modelled outcomes.

We have developed a globally consistent methodology for the application of forward economic guidance into the calculation of ECL for wholesale and retail credit risk. These standard approaches are described below, followed by the management judgemental adjustments made, including those to reflect the circumstances experienced in 2021.

For wholesale portfolio, a global methodology is used for the estimation of the term structure of probability of default ('PD') and loss given default ('LGD'). For PDs, we consider the correlation of forward economic guidance to default rates for a particular industry in the market. For LGD calculations we consider the correlation of forward economic guidance to collateral values and realisation rates for a particular market and industry. PDs and LGDs are estimated for the entire term structure of each instrument.

For impaired loans, LGD estimates take into account independent recovery valuations provided by external consultants where available, or internal forecasts corresponding to anticipated economic conditions and individual company conditions. In estimating the ECL on impaired loans that are individually considered not to be significant, we incorporate forward economic guidance proportionate to the probability-weighted outcome and the Central scenario outcome for non-stage 3 populations.

(a) Credit Risk

(ii) Measurement uncertainty and sensitivity analysis of ECL estimates continued

(audited)

How economic scenarios are reflected in the calculation of ECL continued

For retail, the impact of economic scenarios on PD is modelled at a portfolio level. Historical relationships between observed default rates and macroeconomic variables are integrated into HKFRS 9 ECL estimates by using economic response models. The impact of these scenarios on PD is modelled over a period equal to the remaining maturity of the underlying asset or assets. The impact on LGD is modelled for mortgage portfolios by forecasting future loan-to-value ('LTV') profiles for the remaining maturity of the asset by using market level forecasts of the house price index and applying the corresponding LGD expectation.

These models are based largely on historical observations and correlations with default rates. Management judgemental adjustments are described below.

Management judgemental adjustments

In the context of HKFRS 9, management judgemental adjustments are short-term increases or decreases to the ECL at either a customer, segment or portfolio level to account for late breaking events, model and data limitations and deficiencies, and expert credit judgement applied following management review and challenge.

At 31 December 2021, management judgements were applied to reflect credit risk dynamics not captured by our models. The drivers of the management judgemental adjustments reflect the changing economic outlook and evolving risks across our geographies.

Where the macroeconomic and portfolio risk outlook continues to improve, supported by low levels of observed defaults, adjustments initially taken to reflect increased risk expectations have been retired or reduced.

However, other adjustments have increased where modelled outcomes are overly sensitive and not aligned to observed changes in the risk of the underlying portfolios during the pandemic, or where sector-specific risks are not adequately captured.

The effect of management judgmental adjustments are considered for balances and ECL when determining whether or not a significant increase in credit risk has occurred and are attributed or allocated to a stage as appropriate. This is in accordance with the internal adjustments framework.

Management judgmental adjustments are reviewed under the governance process for HKFRS 9 (as detailed in the section Credit risk management). Review and challenge focuses on the rationale and quantum of the adjustments with further review by the second line of defence where significant. For some management judgemental adjustments, internal frameworks establish the conditions under which these adjustments should no longer be required and as such are considered as part of the governance process. This internal governance process allows management judgemental adjustments to be reviewed regularly and, where possible, to reduce the reliance on these through model recalibration or redevelopment, as appropriate.

Management judgemental adjustments made in estimating the scenario-weighted reported ECL at 31 December 2021 are set out in the following table. The table includes adjustments in relation to data and model limitations, including those driven by late-breaking events and sector specific risks resulting from the pandemic, and as a result of the regular process of model development and implementation.

Management judgemental adjustments to ECL¹:

	Retail	Wholesale	Total
(HK\$m)	31 December 2021		
Low risk counterparties and economies ²	–	85	85
Corporate lending adjustments	–	2,082	2,082
Macroeconomic-related adjustments	(259)	–	(259)
Pandemic economic recovery adjustments	193	–	193
Other lending adjustments	3	29	32
Total	(63)	2,196	2,133

(a) Credit Risk

(ii) Measurement uncertainty and sensitivity analysis of ECL estimates continued

(audited)

Management judgemental adjustments continued

Management judgemental adjustments to ECL¹: continued

	Retail	Wholesale	Total
(HK\$m)	31 December 2020		
Low risk counterparties and economies ²	–	44	44
Corporate lending adjustments	–	686	686
Retail lending adjustments	219	–	219
Retail model default suppression adjustment	503	–	503
Total	722	730	1,452

¹ Management judgemental adjustments presented in the table reflect Increases or (Decreases) to ECL, respectively.

² Low-risk counterparties and economies is comprised of adjustments relating to WPB Insurance only and re-presented to conform with current year's presentation.

At 31 December 2021, wholesale management judgemental adjustments were an ECL increase of HK\$1.4bn mainly from increase in Corporate lending adjustments. These principally reflected the outcome of management judgements for high-risk and vulnerable sectors in some of our key markets, supported by credit experts' input, portfolio risk metrics, quantitative analyses and benchmarks. Considerations include risk of individual exposures under different macroeconomic scenarios and comparison of key risk metrics to pre-pandemic levels, resulting in either releases or increases to ECL in each geography.

The increase in adjustment impact relative to 31 December 2020 was mostly driven by management judgements as a result of the effect of further improvement of macroeconomic scenarios on modelled outcomes and increased dislocation of modelled outcomes to management expectations for high-risk sectors, mainly for China real estate sector. The highest increase was observed in the real estate sector, including a material adjustment to reflect the uncertainty of the higher risk China commercial real estate exposures on account of tightening liquidity and increased refinancing risks. The increase in management judgemental adjustment for China real estate sector was partly offset by adjustment releases in other sectors resulted from improvement in industry outlook and portfolio quality.

For the retail portfolio, management judgemental adjustments mainly relate to macroeconomic conditions and customer support programmes with an ECL underlay of HK\$63m as of 31 December 2021.

- Macroeconomic related adjustments decreased ECL by HK\$259m and other retail lending adjustments increased ECL by HK\$3m. These were primarily to address areas such as economic response model enhancement, customer relief and data limitations.
- Pandemic-related economic recovery adjustments increased ECL by HK\$193m to adjust for the effects of the volatile pace of recovery from the pandemic. This is where in management's judgement, supported by quantitative analyses of portfolio and economic metrics, modelled outcomes which are overly sensitive given the limited observed deterioration in the underlying portfolio during the pandemic.

Economic scenarios sensitivity analysis of ECL estimates

Management considered the sensitivity of the ECL outcome against the economic forecasts as part of the ECL governance process by recalculating the ECL under each scenario described above for selected portfolios, applying a 100% weighting to each scenario in turn. The weighting is reflected in both the determination of a significant increase in credit risk and the measurement of the resulting ECL.

(a) Credit Risk

(ii) Measurement uncertainty and sensitivity analysis of ECL estimates continued

(audited)

Economic scenarios sensitivity analysis of ECL estimates continued

The ECL calculated for the Upside and Downside scenarios should not be taken to represent the upper and lower limits of possible ECL outcomes. The impact of defaults that might occur in the future under different economic scenarios is captured by recalculating ECL for loans in stages 1 and 2 at the balance sheet date. The population of stage 3 loans (in default) at the balance sheet date is unchanged in these sensitivity calculations. Stage 3 ECL would only be sensitive to changes in forecasts of future economic conditions if the loss-given default ('LGD') of a particular portfolio was sensitive to these changes.

There is a particularly high degree of estimation uncertainty in numbers representing more severe scenario when assigned a 100% weighting.

For wholesale credit risk exposures, the sensitivity analysis excludes ECL and financial instruments related to defaulted obligors because the measurement of ECL is relatively more sensitive to credit factors specific to the obligor than future economic scenarios. Therefore, it is impracticable to separate the effect of macroeconomic factors in individual assessments.

For retail credit risk exposures, the sensitivity analysis includes ECL for loans and advances to customers related to defaulted obligors. This is because the retail ECL for secured mortgage portfolios including loans in all stages is sensitive to macroeconomic variables.

Wholesale and retail sensitivity

The wholesale and retail sensitivity analysis is stated inclusive of management judgemental adjustments, as appropriate to each scenario. The results tables exclude portfolios held by insurance business and small portfolios and as such cannot be directly compared with personal and wholesale lending presented in other credit risk tables. Additionally in both the wholesale and retail analysis, the comparative period results for Downside 2 scenario are not directly comparable to the current period, because they reflect different risk profiles relative with the Consensus scenarios for the period end.

Wholesale analysis

HKFRS 9 ECL sensitivity to future economic conditions^{1,3}

	Hong Kong	Mainland China
ECL of financial instruments subject to significant measurement uncertainty ²	31 December 2021	
Reported ECL	2,921	370
Consensus scenarios		
Central scenario	2,550	288
Upside scenario	1,769	96
Downside scenario	4,048	508
Downside 2 scenario	7,947	2,234

HKFRS 9 ECL sensitivity to future economic conditions^{1,3}

	Hong Kong	Mainland China
ECL of financial instruments subject to significant measurement uncertainty ²	31 December 2020	
Reported ECL	1,606	424
Consensus scenarios		
Central scenario	1,248	364
Upside scenario	626	98
Downside scenario	2,370	932
Alternative scenario	5,315	3,503

¹ Excludes ECL and financial instruments on defaulted obligors because the measure of ECL is relatively more sensitive to credit factors specific to the obligor than future economic scenarios.

² Includes off-balance sheet financial instruments that are subject to significant measurement uncertainty.

³ ECL sensitivity is calculated by applying a 100% weighting to each scenario described above, and then applying judgemental overlays where determined appropriate.

(a) Credit Risk

(ii) Measurement uncertainty and sensitivity analysis of ECL estimates continued

(audited)

Wholesale and retail sensitivity continued

Retail analysis

HKFRS 9 ECL sensitivity to future economic conditions¹

	Hong Kong	Mainland China
ECL of loans and advances to customers ²	31 December 2021	
Reported ECL	1,219	24
Consensus scenarios		
Central scenario	1,138	23
Upside scenario	918	22
Downside scenario	1,352	24
Downside 2 scenario	2,047	49

HKFRS 9 ECL sensitivity to future economic conditions¹

	Hong Kong	Mainland China
ECL of loans and advances to customers ²	31 December 2020	
Reported ECL	1,440	49
Consensus scenarios		
Central scenario	1,396	49
Upside scenario	1,339	48
Downside scenario	1,517	50
Alternative scenario	2,030	65

¹ ECL sensitivities exclude portfolios using less complex modelling approaches.

² ECL sensitivity includes only on-balance sheet financial instruments to which HKFRS 9 impairment requirements are applied.

(a) Credit Risk

(iii) Reconciliation of changes in gross carrying/nominal amount and allowances for placings with and advances to banks and loans and advances to customers

The following disclosure provides a reconciliation by stage of the Group's gross carrying/nominal amount and allowances for placings with and advances to banks and loans and advances to customers, including loan commitments and financial guarantees. Movements are calculated on a year-to-date basis and therefore reflect the opening and closing position of the financial instruments.

The transfers of financial instruments represents the impact of stage transfers upon the gross carrying/nominal amount and associated allowance for ECL.

The net remeasurement of ECL arising from stage transfers represents the increase or decrease due to these transfers, for example, moving from a 12-month (stage 1) to a lifetime (stage 2) ECL measurement basis. Net remeasurement excludes the underlying CRR/PD movements of the financial instruments transferring stage. This is captured, along with other credit quality movements in the 'changes in risk parameters – credit quality' line item.

Changes in 'New financial assets originated and purchased', 'Assets derecognised (including final repayments)' and 'Changes to risk parameters – further lending/repayments' represent the impact from volume movements within the Group's lending portfolio.

Reconciliation of changes in gross carrying/nominal amount and allowances for placings with and advances to banks and loans and advances to customers, including loan commitments and financial guarantees²

(audited)

	Non credit – impaired				Credit – impaired				Total	
	Stage 1		Stage 2		Stage 3		POCI ¹			
	Gross carrying/nominal amount	Allowance for ECL	Gross carrying/nominal amount	Allowance for ECL	Gross carrying/nominal amount	Allowance for ECL	Gross carrying/nominal amount	Allowance for ECL	Gross carrying/nominal amount	Allowance for ECL
At 1 January 2021	1,213,008	(1,421)	135,379	(1,896)	5,723	(2,044)	1	–	1,354,111	(5,361)
Transfers of financial instruments:										
– transfers from Stage 1 to Stage 2	(70,798)	237	70,798	(237)	–	–	–	–	–	–
– transfers from Stage 2 to Stage 1	43,558	(302)	(43,558)	302	–	–	–	–	–	–
– transfers to Stage 3	(5,131)	14	(1,302)	54	6,433	(68)	–	–	–	–
– transfers from Stage 3	10	(1)	42	(1)	(52)	2	–	–	–	–
Net remeasurement of ECL arising from transfer of stage	–	144	–	(607)	–	(13)	–	–	–	(476)
New financial assets originated and purchased	256,859	(275)	16,987	(840)	507	(47)	973	–	275,326	(1,162)
Assets derecognised (including final repayments)	(163,501)	127	(32,169)	254	(699)	95	–	–	(196,369)	476
Changes to risk parameters – further lending/(repayment)	5,207	223	4,368	161	(1,070)	46	(2)	–	8,503	430
Changes in risk parameters – credit quality	–	479	–	(757)	–	(1,885)	–	–	–	(2,163)
Changes to model used for ECL calculation	–	(38)	–	(8)	–	–	–	–	–	(46)
Assets written off	–	–	–	–	(1,233)	1,233	–	–	(1,233)	1,233
Credit related modifications that resulted in derecognition	–	–	(768)	6	(208)	–	–	–	(976)	6
Foreign exchange and others	4,547	(9)	339	(3)	56	(19)	–	–	4,942	(31)
At 31 December 2021	1,283,759	(822)	150,116	(3,572)	9,457	(2,700)	972	–	1,444,304	(7,094)
										Total
Change in ECL in income statement (charge)/release for the year										(2,935)
Add: Recoveries										167
Add/(less): Others										(37)
Total ECL (charge)/release for the year										(2,805)

(a) Credit Risk

(iii) Reconciliation of changes in gross carrying/nominal amount and allowances for placings with and advances to banks and loans and advances to customers continued

Reconciliation of changes in gross carrying/nominal amount and allowances for placings with and advances to banks and loans and advances to customers, including loan commitments and financial guarantees² continued

(audited)

	At 31 December 2021		For the year ended 31 December 2021
	Gross carrying/ nominal amount	Allowance for ECL	ECL (charge)/ release
Placings with and advances to banks and loans and advances to customers, including loan commitments and financial guarantees	1,444,304	(7,094)	(2,805)
Other financial assets measured at amortised cost	214,623	(167)	(6)
Summary of financial instruments to which the impairment requirements in HKFRS 9 are applied	1,658,927	(7,261)	(2,811)
Debt instruments measured at FVOCI ²	354,050	(9)	–
Performance and other guarantees not considered for HKFRS 9	26,439	(3)	4
Total allowance for ECL/consolidated income statement ECL charge for the year	2,039,416	(7,273)	(2,807)

¹ Purchased or originated credit-impaired ('POCI') represented distressed restructuring.

² For the purposes of this disclosure, gross carrying value is defined as the amortised cost of a financial asset, before adjusting for any loss allowance. As such, the gross carrying value of debt instruments at FVOCI as presented above will not reconcile to the Consolidated Balance Sheet as it excludes fair value gains and losses.

	Non credit – impaired				Credit – impaired				Total	
	Stage 1		Stage 2		Stage 3		POCI ¹			
	Gross carrying/ nominal amount	Allowance for ECL	Gross carrying/ nominal amount	Allowance for ECL	Gross carrying/ nominal amount	Allowance for ECL	Gross carrying/ nominal amount	Allowance for ECL	Gross carrying/ nominal amount	Allowance for ECL
At 1 January 2020	1,243,623	(1,014)	118,301	(1,838)	2,073	(814)	–	–	1,363,997	(3,666)
Transfers of financial instruments:										
– transfers from Stage 1 to Stage 2	(71,117)	118	71,117	(118)	–	–	–	–	–	–
– transfers from Stage 2 to Stage 1	33,455	(480)	(33,455)	480	–	–	–	–	–	–
– transfers to Stage 3	(1,607)	2	(1,443)	52	3,050	(54)	–	–	–	–
– transfers from Stage 3	–	–	31	–	(31)	–	–	–	–	–
Net remeasurement of ECL arising from transfer of stage	–	219	–	(101)	–	(3)	–	–	–	115
New financial assets originated and purchased	186,164	(342)	7,988	(177)	563	(329)	2	–	194,717	(848)
Assets derecognised (including final repayments)	(111,033)	74	(21,136)	253	(357)	109	–	–	(132,526)	436
Changes to risk parameters – further lending/(repayment)	(73,811)	117	(6,336)	135	1,463	(399)	(1)	–	(78,685)	(147)
Changes in risk parameters – credit quality	–	(255)	–	(1,610)	–	(1,645)	–	–	–	(3,510)
Changes to model used for ECL calculation	–	140	–	1,028	–	–	–	–	–	1,168
Assets written off	–	–	–	–	(1,091)	1,091	–	–	(1,091)	1,091
Foreign exchange and others	7,334	–	312	–	53	–	–	–	7,699	–
At 31 December 2020	1,213,008	(1,421)	135,379	(1,896)	5,723	(2,044)	1	–	1,354,111	(5,361)
										Total
Change in ECL in income statement (charge)/release for the year										(2,786)
Add: Recoveries										104
Add/(less): Others										43
Total ECL (charge)/release for the year										(2,639)

(a) Credit Risk

(iii) Reconciliation of changes in gross carrying/nominal amount and allowances for placings with and advances to banks and loans and advances to customers continued

Reconciliation of changes in gross carrying/nominal amount and allowances for placings with and advances to banks and loans and advances to customers, including loan commitments and financial guarantees² continued

(audited)

	At 31 December 2020		For the year ended 31 December 2020
	Gross carrying/ nominal amount	Allowance for ECL	ECL (charge)/ release
Placings with and advances to banks and loans and advances to customers, including loan commitments and financial guarantees	1,354,111	(5,361)	(2,639)
Other financial assets measured at amortised cost	188,872	(187)	(99)
Summary of financial instruments to which the impairment requirements in HKFRS 9 are applied	1,542,983	(5,548)	(2,738)
Debt instruments measured at FVOCI ²	411,423	(9)	2
Performance and other guarantees not considered for HKFRS 9	16,774	(7)	(2)
Total allowance for ECL/consolidated income statement ECL charge for the year	1,971,180	(5,564)	(2,738)

¹ Purchased or originated credit-impaired ('POCI') represented distressed restructuring.

² For the purposes of this disclosure, gross carrying value is defined as the amortised cost of a financial asset, before adjusting for any loss allowance. As such, the gross carrying value of debt instruments at FVOCI as presented above will not reconcile to the Consolidated Balance Sheet as it excludes fair value gains and losses.

(iv) Credit quality of financial instruments

(audited)

We assess the credit quality of all financial instruments that are subject to credit risk. The credit quality of financial instruments is a point-in-time assessment of the probability of default of financial instruments, whereas HKFRS 9 stages 1 and 2 are determined based on relative deterioration of credit quality since initial recognition. Accordingly, for non-credit impaired financial instruments, there is no direct relationship between the credit quality assessments and HKFRS 9 stages 1 and 2, though typically the lowered credit quality bands exhibit a higher proportion in stage 2.

(a) Credit Risk

(iv) Credit quality of financial instruments continued

(audited)

Distribution of financial instruments by credit quality at 31 December 2021

	Gross carrying/notional amount						Allowance for ECL	Net
	Strong	Good	Satisfactory	Sub- standard	Credit- impaired	Total		
In-scope for HKFRS 9 impairment								
Loans and advances to customers at amortised cost	473,995	216,803	287,835	15,263	10,429	1,004,325	(6,928)	997,397
– personal	345,528	15,838	12,295	205	858	374,724	(1,281)	373,443
– corporate and commercial	127,835	193,188	257,956	15,058	9,467	603,504	(5,486)	598,018
– non-bank financial institutions	632	7,777	17,584	–	104	26,097	(161)	25,936
Placings with and advances to banks at amortised cost	72,243	238	13	–	–	72,494	(1)	72,493
Cash and balances at central banks	16,896	–	–	–	–	16,896	–	16,896
Reverse repurchase agreements – non-trading	14,728	3,100	993	–	–	18,821	–	18,821
Financial investments measured at amortised cost	109,359	28,965	3,056	–	–	141,380	(153)	141,227
Other assets	24,171	7,714	5,631	10	–	37,526	(14)	37,512
Debt instruments measured at fair value through other comprehensive income ¹	353,816	234	–	–	–	354,050	(9)	354,041
	1,065,208	257,054	297,528	15,273	10,429	1,645,492	(7,105)	1,638,387
Out-of-scope for HKFRS 9 impairment								
Trading assets	47,028	165	199	–	–	47,392	–	47,392
Other financial assets designated and otherwise mandatorily measured at fair value through profit or loss	267	771	3	–	–	1,041	–	1,041
Derivative financial instruments	10,267	2,923	27	7	–	13,224	–	13,224
	57,562	3,859	229	7	–	61,657	–	61,657
	1,122,770	260,913	297,757	15,280	10,429	1,707,149	(7,105)	1,700,044
Percentage of total credit quality	66%	15%	17%	1%	1%	100%		
Loan and other credit related commitments ²	279,705	47,077	38,053	219	–	365,054	(162)	364,892
Financial guarantee and similar contracts ²	424	893	1,108	6	–	2,431	(3)	2,428

¹ For the purposes of this disclosure, gross carrying value is defined as the amortised cost of a financial asset, before adjusting for any loss allowance. As such, the gross carrying value of debt instruments at FVOCI as presented above will not reconcile to the Consolidated Balance Sheet as it excludes fair value gains and losses.

² Figures do not include commitments and financial guarantee contracts not subject to impairment requirements under HKFRS 9. As such, the amounts do not agree with the figures shown in note 45 on the Consolidated Financial Statements.

(a) Credit Risk

(iv) Credit quality of financial instruments continued

(audited)

Distribution of financial instruments by credit quality at 31 December 2020

	Gross carrying/notional amount						Allowance for ECL	Net
	Strong	Good	Satisfactory	Sub- standard	Credit- impaired	Total		
In-scope for HKFRS 9 impairment								
Loans and advances to customers at amortised cost	434,281	215,848	281,689	12,412	5,724	949,954	(5,180)	944,774
– personal	322,117	17,634	11,488	342	984	352,565	(1,525)	351,040
– corporate and commercial	112,107	188,178	258,765	12,004	4,580	575,634	(3,542)	572,092
– non-bank financial institutions	57	10,036	11,436	66	160	21,755	(113)	21,642
Placements with and advances to banks at amortised cost	44,044	311	2	–	–	44,357	–	44,357
Cash and balances at central banks	11,226	–	–	–	–	11,226	–	11,226
Reverse repurchase agreements – non-trading	11,280	2,080	–	–	–	13,360	–	13,360
Financial investments measured at amortised cost	105,830	22,385	6,782	–	–	134,997	(173)	134,824
Other assets	17,225	7,554	4,498	12	–	29,289	(14)	29,275
Debt instruments measured at fair value through other comprehensive income ¹	411,036	387	–	–	–	411,423	(9)	411,414
	1,034,922	248,565	292,971	12,424	5,724	1,594,606	(5,376)	1,589,230
Out-of-scope for HKFRS 9 impairment								
Trading assets	36,198	874	–	–	–	37,072	–	37,072
Other financial assets designated and otherwise mandatorily measured at fair value through profit or loss	243	1,041	–	–	–	1,284	–	1,284
Derivative financial instruments	13,864	3,117	199	1	–	17,181	–	17,181
	50,305	5,032	199	1	–	55,537	–	55,537
	1,085,227	253,597	293,170	12,425	5,724	1,650,143	(5,376)	1,644,767
Percentage of total credit quality	66%	15%	18%	1%	0%	100%		
Loan and other credit related commitments ²	269,830	54,036	32,823	87	–	356,776	(163)	356,613
Financial guarantee and similar contracts ²	99	1,325	1,590	10	–	3,024	(18)	3,006

¹ For the purposes of this disclosure, gross carrying value is defined as the amortised cost of a financial asset, before adjusting for any loss allowance. As such, the gross carrying value of debt instruments at FVOCI as presented above will not reconcile to the Consolidated Balance Sheet as it excludes fair value gains and losses.

² Figures do not include commitments and financial guarantee contracts not subject to impairment requirements under HKFRS 9. As such, the amounts do not agree with the figures shown in note 45 on the Consolidated Financial Statements.

(a) Credit Risk

(iv) Credit quality of financial instruments continued

(audited)

Distribution of financial instruments to which the impairment requirements in HKFRS 9 are applied, by credit quality and stage distribution at 31 December 2021

	Gross carrying/notional amount					Total	Allowance for ECL	Net
	Strong	Good	Satisfactory	Sub- standard	Credit- impaired			
Loans and advances to customers at amortised cost	473,995	216,803	287,835	15,263	10,429	1,004,325	(6,928)	997,397
– stage 1	460,810	186,463	204,354	522	–	852,149	(762)	851,387
– stage 2	13,185	30,340	83,481	14,741	–	141,747	(3,466)	138,281
– stage 3	–	–	–	–	9,457	9,457	(2,700)	6,757
– POCI	–	–	–	–	972	972	–	972
Placings with and advances to banks at amortised cost	72,243	238	13	–	–	72,494	(1)	72,493
– stage 1	72,204	94	13	–	–	72,311	(1)	72,310
– stage 2	39	144	–	–	–	183	–	183
– stage 3	–	–	–	–	–	–	–	–
– POCI	–	–	–	–	–	–	–	–
Other financial assets measured at amortised cost	165,154	39,779	9,680	10	–	214,623	(167)	214,456
– stage 1	164,041	38,481	7,842	–	–	210,364	(99)	210,265
– stage 2	1,113	1,298	1,838	10	–	4,259	(68)	4,191
– stage 3	–	–	–	–	–	–	–	–
– POCI	–	–	–	–	–	–	–	–
Loan and other credit-related commitments²	279,705	47,077	38,053	219	–	365,054	(162)	364,892
– stage 1	279,684	44,406	32,742	184	–	357,016	(57)	356,959
– stage 2	21	2,671	5,311	35	–	8,038	(105)	7,933
– stage 3	–	–	–	–	–	–	–	–
– POCI	–	–	–	–	–	–	–	–
Financial guarantees and similar contracts²	424	893	1,108	6	–	2,431	(3)	2,428
– stage 1	422	860	999	2	–	2,283	(2)	2,281
– stage 2	2	33	109	4	–	148	(1)	147
– stage 3	–	–	–	–	–	–	–	–
– POCI	–	–	–	–	–	–	–	–
	991,521	304,790	336,689	15,498	10,429	1,658,927	(7,261)	1,651,666
Debt instruments at FVOCI¹								
– stage 1	353,816	234	–	–	–	354,050	(9)	354,041
– stage 2	–	–	–	–	–	–	–	–
– stage 3	–	–	–	–	–	–	–	–
– POCI	–	–	–	–	–	–	–	–
	353,816	234	–	–	–	354,050	(9)	354,041

¹ For the purposes of this disclosure, gross carrying value is defined as the amortised cost of a financial asset, before adjusting for any loss allowance. As such, the gross carrying value of debt instruments at FVOCI as presented above will not reconcile to the Consolidated Balance Sheet as it excludes fair value gains and losses.

² Figures do not include commitments and financial guarantee contracts not subject to impairment requirements under HKFRS 9. As such, the amounts do not agree with the figures shown in note 45 on the Consolidated Financial Statements.

(a) Credit Risk

(iv) Credit quality of financial instruments continued

(audited)

Distribution of financial instruments to which the impairment requirements in HKFRS 9 are applied, by credit quality and stage distribution at 31 December 2020

	Gross carrying/notional amount						Allowance for ECL	Net
	Strong	Good	Satisfactory	Sub- standard	Credit- impaired	Total		
Loans and advances to customers at amortised cost	434,281	215,848	281,689	12,412	5,724	949,954	(5,180)	944,774
– stage 1	430,162	189,437	193,739	808	–	814,146	(1,315)	812,831
– stage 2	4,119	26,411	87,950	11,604	–	130,084	(1,821)	128,263
– stage 3	–	–	–	–	5,723	5,723	(2,044)	3,679
– POCI	–	–	–	–	1	1	–	1
Placings with and advances to banks at amortised cost	44,044	311	2	–	–	44,357	–	44,357
– stage 1	43,854	65	–	–	–	43,919	–	43,919
– stage 2	190	246	2	–	–	438	–	438
– stage 3	–	–	–	–	–	–	–	–
– POCI	–	–	–	–	–	–	–	–
Other financial assets measured at amortised cost	145,561	32,019	11,280	12	–	188,872	(187)	188,685
– stage 1	143,610	31,506	9,227	1	–	184,344	(133)	184,211
– stage 2	1,951	513	2,053	11	–	4,528	(54)	4,474
– stage 3	–	–	–	–	–	–	–	–
– POCI	–	–	–	–	–	–	–	–
Loan and other credit-related commitments²	269,830	54,036	32,823	87	–	356,776	(163)	356,613
– stage 1	269,810	51,989	30,372	70	–	352,241	(90)	352,151
– stage 2	20	2,047	2,451	17	–	4,535	(73)	4,462
– stage 3	–	–	–	–	–	–	–	–
– POCI	–	–	–	–	–	–	–	–
Financial guarantees and similar contracts²	99	1,325	1,590	10	–	3,024	(18)	3,006
– stage 1	97	1,264	1,337	4	–	2,702	(16)	2,686
– stage 2	2	61	253	6	–	322	(2)	320
– stage 3	–	–	–	–	–	–	–	–
– POCI	–	–	–	–	–	–	–	–
	893,815	303,539	327,384	12,521	5,724	1,542,983	(5,548)	1,537,435
Debt instruments at FVOCI¹								
– stage 1	411,036	387	–	–	–	411,423	(9)	411,414
– stage 2	–	–	–	–	–	–	–	–
– stage 3	–	–	–	–	–	–	–	–
– POCI	–	–	–	–	–	–	–	–
	411,036	387	–	–	–	411,423	(9)	411,414

¹ For the purposes of this disclosure, gross carrying value is defined as the amortised cost of a financial asset, before adjusting for any loss allowance. As such, the gross carrying value of debt instruments at FVOCI as presented above will not reconcile to the Consolidated Balance Sheet as it excludes fair value gains and losses.

² Figures do not include commitments and financial guarantee contracts not subject to impairment requirements under HKFRS 9. As such, the amounts do not agree with the figures shown in note 45 on the Consolidated Financial Statements.

(a) Credit Risk

(iv) Credit quality of financial instruments continued

Mainland China Commercial Real Estate

(unaudited)

The following table presents the Group's total exposures to mainland China commercial real estate ('CRE') at 31 December 2021, by market and credit quality.

	Hong Kong	Mainland China	Total
Loans and advances to customers ¹	37,828	18,009	55,837
Guarantees issued and others ²	9,123	9,839	18,962
Total mainland China CRE exposure at 31 December 2021	46,951	27,848	74,799
Distribution of mainland China CRE exposure by credit quality			
– Strong	11,461	6,184	17,645
– Good	11,762	8,822	20,584
– Satisfactory	12,069	11,954	24,023
– Sub-standard	8,607	94	8,701
– Credit-impaired	3,052	794	3,846
At 31 December 2021	46,951	27,848	74,799
Allowance for ECL	2,646	174	2,820

¹ Amounts represent gross carrying amount.

² Amounts represent nominal amount.

At 31 December 2021, the Group had no direct credit exposures to developers in the 'red' category of the Chinese government's 'three red lines' framework. The Group's exposures related to companies whose primary activities are focused on residential, commercial and mixed-use real estate activities. Lending is generally focused on tier 1 and 2 cities.

Mainland China CRE exposure booked in Hong Kong had a higher degree of uncertainty due to tightening liquidity and increased refinancing risks, despite 75% of the portfolio booked with a credit quality of 'satisfactory' or above. At 31 December 2021, the Group had allowances for ECL of HK\$2,646m held against mainland China CRE exposure booked in Hong Kong. We will continue to monitor the prevailing situation closely.

(v) Credit-impaired loans

(audited)

We determine that a financial instrument is credit-impaired and in stage 3 by considering relevant objective evidence, primarily whether:

- contractual payments of either principal or interest are past due for more than 90 days;
- there are other indications that the borrower is unlikely to pay, such as when a concession has been granted to the borrower for economic or legal reasons relating to the borrower's financial condition; or
- the loan is otherwise considered to be in default. If such unlikelihood to pay is not identified at an earlier stage, it is deemed to occur when an exposure is 90 days past due, even where regulatory rules permit default to be defined based on 180 days past due. Therefore, the definitions of credit-impaired and default are aligned as far as possible so that stage 3 represents all loans that are considered defaulted or otherwise credit-impaired.

(a) Credit Risk

(vi) Customer relief programmes

(unaudited)

In response to the COVID-19 pandemic, governments and regulators around the world have introduced a number of support measures for both personal and wholesale customers. The following table presents the number of personal accounts/wholesale customers and the associated drawn loan values of customers under these schemes and Hang Seng-specific measures at 31 December 2021.

		At 31 December 2021	At 31 December 2020
Personal lending			
Number of customers granted mortgages payment holidays	Thousands	0.08	0.57
Drawn loan value of customers granted mortgage payment holidays	HK\$m	210	1,739
Total mortgages	HK\$m	304,830	284,111
Payment holidays as a proportion of total mortgages	%	0.1	0.6
Number of customers granted other personal lending payment holidays	Thousands	0.13	0.24
Drawn loan value of customers granted other personal lending payment holidays	HK\$m	267	537
Total other personal lending	HK\$m	69,894	68,454
Payment holidays as a proportion of total other personal lending	%	0.4	0.8
Wholesale lending			
Number of customers under customer relief schemes	Thousands	0.11	0.22
Drawn loan value of customers under customer relief schemes	HK\$m	9,130	13,658
Total wholesale loans and advances to customers	HK\$m	629,601	597,389
Customer relief as a proportion of total wholesale loans and advances to customers	%	1.5	2.3
Total customer relief as a proportion of total loans and advances to customers	%	1.0	1.7

(a) Credit Risk

(vi) Customer relief programmes continued (unaudited)

The initial granting of customer relief does not automatically trigger a migration to stage 2 or 3. However, information provided by payment deferrals is considered in the context of other reasonable and supportable information, as part of the overall assessment for significant increase in credit risk and for credit impairment, to identify loans for which lifetime ECL is appropriate. An extension in payment deferral does not automatically result in stage 2 or stage 3. The key accounting and credit risk judgement to ascertain whether a significant increase in credit risk has occurred is whether the economic effects of COVID-19 on the customer are likely to be temporary over the lifetime of the loan, and do not indicate that a concession is being made in respect of financial difficulty that would be consistent with stage 3.

Customer relief schemes in Hong Kong

Wholesale

Given the continued challenges encountered by the Hong Kong business community on the back of the COVID-19 outbreak, the Bank has rolled out certain temporary relief measures in 2020 to support our corporate clients during this period. The overarching premise of these initiatives was to support the immediate cash flow and liquidity of our customers, without increasing the overall quantum of exposure/risk appetite to these clients. Eligible customers were required to meet a set of credit criteria.

The prescribed eligibility criteria (which include parameters for CRR, favourable past due history and no Worry-Watch-Monitor classification etc.) are to ensure that these measures are extended only to the 'good book', clients are not already showing any signs of stress and that these arrangements are more proactive and flexible approaches to commercial restructuring as opposed to forbearance/renewed loans/distressed restructuring.

The relief measures are as follows:

- Programmes implemented by the Bank in Hong Kong in February 2020 for 'eligible client' include:
 - Tenor extension for up to 60 days for trade finance
 - Principal moratorium and/or tenor extension for up to 6 months for non-trade finance
- Several rounds of industry-wide relief programmes initiated by the Hong Kong Monetary Authority ('HKMA') for eligible corporates with turnover not exceeding HK\$800m and other prescribed criteria was launched since May 2020. The Pre-approved Principal Payment Holiday Scheme for Corporate Customers ('PPPHS') entailed essentially a up to 90-day tenor extension for trade finance and/or up to 6-month principal moratorium for non-trade finance in each programme.
- A Special 100% Loan Guarantee under the SME Financing Guarantee Scheme ('SFGS100') was launched in April 20. The guarantee covers a maximum tenor of 3 years and maximum loan size of HK\$4m, and involved transfer of title of the loan to the Hong Kong Mortgage Corporation ('HKMC'), a quasi-government agency. The HKMC has further enhanced the maximum loan amount to HK\$6m and loan tenor to 8 years subsequently.

Retail

The HKMA in early February 2020 encouraged Authorised Institutions to adopt a sympathetic stance in dealing with customers facing financial stress due to the COVID-19 and, to the extent prudent risk management principles permit, consider requests from these borrowers for temporary relief arrangements favourably. The Bank introduced a suite of comprehensive relief measures to ease the financial burden and short term cash flow pressures on personal customers created by the spread of COVID-19. This exemplifies the Bank's commitment to support the local community during these tough times.

(a) Credit Risk

(vi) Customer relief programmes continued (unaudited)

Customer relief schemes in Hong Kong continued

Retail continued

The relief measures are as follows:

- Deferred Mortgage Principal Repayment Plan is generally in 6 months and further extension of 6 months is allowed upon request (total up to 12 months). Eligible customers only need to repay interest during the period and the plan is offered to existing mortgage loan customers who have a good repayment record in the past 6 months and also covers Government Home Ownership Scheme ('GHOS')/ Tenants Purchase Scheme ('TPS');
- Personal Loan Guarantee Scheme ('PLGS') launched on 28 April 2021 – a loan with maximum HK\$80,000 and optional 12 months' payment holidays to customers who are unemployed after January 2020 due to COVID-19 with interest rate 1% APR & interest will be rebated to customers after pay-off.

(vii) Collateral and other credit enhancements

(audited)

Although collateral can be an important mitigant of credit risk, it is the Group's practice to lend on the basis of the customer's ability to meet their obligations out of their cash

flow resources rather than rely on the value of security offered. Depending on the customer's standing and the type of product, facilities may be provided unsecured. However, for certain lending decisions a charge over collateral is usually obtained, and is important for the credit decision and pricing, and it is the Bank's practice to obtain that collateral and sell it in the event of default as a source of repayment.

Such collateral has a significant financial effect in mitigating our exposure to credit risk and the objective of the disclosure below is to quantify these forms. We may also manage our risk by employing other types of collateral and credit risk enhancements, such as second charges, other liens and unsupported guarantees, but the valuation of such mitigants is less certain and their financial effect has not been quantified in the loans shown below.

We have quantified below the value of fixed charges we hold over a specific asset (or assets) of a borrower for which we have a practical ability and history of enforcing in satisfying a debt in the event of a borrower failing to meet their contractual obligations and where the asset is cash or can be realised in the form of cash by sale in an established market.

Personal lending

(audited)

For personal lending, the collateral held has been analysed below separately for residential mortgages and other personal lending due to the different nature of collateral held on the portfolios.

(a) Credit Risk

(vii) Collateral and other credit enhancements continued

(unaudited)

Residential mortgages

(audited)

The following table shows residential mortgage lending including off-balance sheet loan commitments by level of collateralisation.

	At 31 December 2021			At 31 December 2020		
	Gross carrying/ nominal amount	ECL	ECL coverage %	Gross carrying/ nominal amount	ECL	ECL coverage %
Stage 1						
Fully collateralised	303,236	(9)	0.00	281,826	(1)	0.00
LTV ratio:						
– Less than 70%	245,906	(9)	0.00	238,721	(1)	0.00
– 71% to 90%	48,846	(0)	0.00	31,581	(0)	0.00
– 91% to 100%	8,484	(0)	0.00	11,524	(0)	0.00
Partially collateralised (A)	42	–	–	77	(0)	0.00
Total	303,278	(9)	0.00	281,903	(1)	0.00
– Collateral value on A	41			73		
Stage 2						
Fully collateralised	5,636	(0)	0.01	5,010	(0)	0.00
LTV ratio:						
– Less than 70%	5,248	(0)	0.01	4,698	(0)	0.00
– 71% to 90%	358	–	–	257	(0)	0.00
– 91% to 100%	30	(0)	0.00	55	(0)	0.00
Partially collateralised (B)	–	–	–	1	–	–
Total	5,636	(0)	0.01	5,011	(0)	0.00
– Collateral value on B	–			1		
Stage 3						
Fully collateralised	432	(12)	2.72	481	(45)	9.36
LTV ratio:						
– Less than 70%	414	(12)	2.82	467	(45)	9.64
– 71% to 90%	18	(0)	0.52	14	(0)	0.14
– 91% to 100%	–	–	–	–	–	–
Partially collateralised (C)	–	–	–	5	–	–
Total	432	(12)	2.72	486	(45)	9.27
– Collateral value on C	–			5		
POCI						
Fully collateralised	–	–	–	–	–	–
LTV ratio:						
– Less than 70%	–	–	–	–	–	–
– 71% to 90%	–	–	–	–	–	–
– 91% to 100%	–	–	–	–	–	–
Partially collateralised (D)	–	–	–	–	–	–
Total	–	–	–	–	–	–
– Collateral value on D	–			–		
	309,346	(21)	0.01	287,400	(46)	0.02

The ECL coverage represents the actual ECL divided by gross carrying/nominal amount.

The collateral included in the table above consists of fixed first charges on residential real estate.

(a) Credit Risk

(vii) Collateral and other credit enhancements

continued

(audited)

Residential mortgages continued

(audited)

The loan-to-value ('LTV') ratio in the table above is calculated as the gross on-balance sheet carrying amount of the loan and any off-balance sheet loan commitment at the balance sheet date as a percentage of the current value of collateral. The current value of collateral is determined through a combination of professional valuations, physical inspections or house price indices. Valuations are updated on a regular basis and more frequently when market conditions or portfolio performance are subject to significant change or where a loan is identified and assessed as impaired. The collateral valuation excludes any adjustments for obtaining and selling the collateral.

Other personal lending

(audited)

Other personal lending consists primarily of personal loans,

overdrafts and credit cards, all of which are generally unsecured, except lending to private banking customers which are generally secured.

Corporate and commercial and financial (non-bank) lending

(audited)

For corporate and commercial and financial (non-bank) lending, the collateral held has been analysed below separately for commercial real estate and other corporate and commercial and financial (non-bank) lending due to the different nature of collateral held on the portfolios.

Commercial real estate

(audited)

Commercial real estate lending includes the financing of corporate and institutional customers who are investing primarily in income-producing assets and, to a lesser extent, in their construction and development.

The following table shows commercial real estate lending including off-balance sheet loan commitments by level of collateralisation.

	At 31 December 2021			At 31 December 2020		
	Gross carrying/ nominal amount	ECL	ECL coverage %	Gross carrying/ nominal amount	ECL	ECL coverage %
Stage 1						
Not collateralised	75,656	(32)	0.04	98,686	(41)	0.04
Fully collateralised	134,639	(84)	0.06	151,276	(110)	0.07
Partially collateralised (A)	4,721	(3)	0.06	4,690	(5)	0.11
Total	215,016	(119)	0.06	254,652	(156)	0.06
– Collateral value on A	2,948			3,700		
Stage 2						
Not collateralised	32,398	(1,986)	6.13	3,864	(4)	0.10
Fully collateralised	25,433	(175)	0.69	24,248	(210)	0.87
Partially collateralised (B)	778	(10)	1.29	1,081	(14)	1.30
Total	58,609	(2,171)	3.70	29,193	(228)	0.78
– Collateral value on B	361			889		
Stage 3						
Not collateralised	1,298	(414)	31.90	–	–	–
Fully collateralised	2,637	(342)	12.97	129	(18)	13.95
Partially collateralised (C)	–	–	–	–	–	–
Total	3,935	(756)	19.21	129	(18)	13.95
– Collateral value on C	–			–		
POCI						
Not collateralised	–	–	–	–	–	–
Fully collateralised	765	–	–	–	–	–
Partially collateralised (D)	–	–	–	–	–	–
Total	765	–	–	–	–	–
– Collateral value on D	–			–		
	278,325	(3,046)	1.09	283,974	(402)	0.14

(a) Credit Risk

(vii) Collateral and other credit enhancements

continued

(audited)

Commercial real estate continued

(audited)

The collateral included in the table above consists of fixed first charges on real estate and charges over cash for the commercial real estate sector. The table includes lending to major property developers which is typically secured by guarantees or is unsecured.

The value of commercial real estate collateral is determined through a combination of professional and internal valuations and physical inspection. Due to the complexity of collateral valuations for commercial real estate, local valuation policies determine the frequency of review based on local market conditions. Revaluations are sought with greater frequency

where, as part of the regular credit assessment of the obligor, material concerns arise in relation to the transaction which may reflect on the underlying performance of the collateral, or in circumstances where an obligor's credit quality has declined sufficiently to cause concern that the principal payment source may not fully meet the obligation (i.e. the obligor's credit quality classification indicates it is at the lower end e.g. sub-standard, or approaching impaired).

Commercial real estate lending includes the financing of corporate, institutional and high net worth customers who are investing primarily in income-producing assets and, to a lesser extent, in their construction and development.

Other corporate and commercial and financial (non-bank) lending

(audited)

The following table shows corporate, commercial and financial (non-bank) lending including off-balance sheet loan commitments by level of collateralisation.

	At 31 December 2021			At 31 December 2020		
	Gross carrying/ nominal amount	ECL	ECL coverage %	Gross carrying/ nominal amount	ECL	ECL coverage %
Stage 1						
Not collateralised	321,650	(280)	0.09	266,101	(371)	0.14
Fully collateralised	148,902	(104)	0.07	139,653	(252)	0.18
Partially collateralised (A)	53,498	(25)	0.05	46,560	(69)	0.15
Total	524,050	(409)	0.08	452,314	(692)	0.15
– Collateral value on A	23,659			20,574		
Stage 2						
Not collateralised	23,596	(204)	0.86	36,635	(198)	0.54
Fully collateralised	53,111	(335)	0.63	55,445	(512)	0.92
Partially collateralised (B)	9,259	(30)	0.32	15,051	(207)	1.38
Total	85,966	(569)	0.66	107,131	(917)	0.86
– Collateral value on B	3,532			7,724		
Stage 3						
Not collateralised	1,881	(1,252)	66.56	1,903	(1,342)	70.52
Fully collateralised	952	(6)	0.63	945	(37)	3.92
Partially collateralised (C)	1,831	(529)	28.89	1,763	(428)	24.28
Total	4,664	(1,787)	38.31	4,611	(1,807)	39.19
– Collateral value on C	1,159			1,084		
POCI						
Not collateralised	–	–	–	1	–	–
Fully collateralised	207	–	–	–	–	–
Partially collateralised (D)	–	–	–	–	–	–
Total	207	–	–	1	–	–
– Collateral value on D	–			–		
	614,887	(2,765)	0.45	564,057	(3,416)	0.61

(a) Credit Risk

(vii) Collateral and other credit enhancements

continued

(unaudited)

Other corporate and commercial and financial (non-bank) lending continued

(audited)

The collateral used in the assessment of the above primarily includes first legal charges over real estate and charges over cash in the commercial and industrial sector and charges over cash and marketable financial instruments in the financial sector.

It should be noted that the table above excludes other types of collateral which are commonly taken for corporate and commercial lending such as unsupported guarantees and floating charges over the assets of a customer's business. While such mitigants have value, often providing rights in insolvency, their assignable value is insufficiently certain. They are assigned no value for disclosure purposes.

As with commercial real estate the value of real estate collateral included in the table above is generally determined through a combination of professional and internal valuations and physical inspection. The frequency of revaluation is undertaken on a similar basis to commercial real estate loans and advances; however, for financing activities in corporate and commercial lending that are not predominantly commercial real estate-oriented, collateral value is not as strongly correlated to principal repayment performance. Collateral values will generally be refreshed when an obligor's general credit performance deteriorates and it is necessary to assess the likely performance of secondary sources of repayment should reliance upon them prove necessary. For the purposes of the table above, cash is valued at its nominal value and marketable securities at their fair value.

Placings with and advances to banks

(audited)

Placings with and advances to banks are typically unsecured. At 31 December 2021, HK\$72,493m (2020: HK\$44,357m) of placings with and advances to banks rated CRR 1 to 5, including loan commitments, are uncollateralised.

Derivatives

(audited)

The ISDA Master Agreement is our preferred agreement for documenting derivatives activity. It provides the contractual

framework within which dealing activity across a full range of over-the-counter ('OTC') products is conducted, and contractually binds both parties to apply close-out netting across all outstanding transactions covered by an agreement if either party defaults or another pre-agreed termination event occurs. It is common, and the Group's preferred practice, for the parties to execute a Credit Support Annex ('CSA') in conjunction with the ISDA Master Agreement. Under a CSA, collateral is passed between the parties to mitigate the counterparty risk inherent in outstanding positions. The majority of our CSAs are with financial institutional clients. Please refer to note 47 'Offsetting of financial assets and financial liabilities' for further details.

Other credit risk exposures

(audited)

In addition to collateralised lending described above, other credit enhancements are employed and methods used to mitigate credit risk arising from financial assets. These are described in more detail below.

Government, bank and other financial institution-issued securities may benefit from additional credit enhancement, notably through government guarantees that reference these assets. Corporate-issued debt securities are primarily unsecured. Debt securities issued by banks and financial institutions include asset-backed securities ('ABS') and similar instruments, which are supported by underlying pools of financial assets. Credit risk associated with ABS is reduced through the purchase of credit default swap ('CDS') protection.

The Group's maximum exposure to credit risk includes financial guarantees and similar arrangements that it issues or enters into, and loan commitments to which it is irrevocably committed. Depending on the terms of the arrangement, the Group may have recourse to additional credit mitigation in the event that a guarantee is called upon or a loan commitment is drawn and subsequently defaults. The risks and exposures from these are captured and managed in accordance with the Group's overall credit risk management policies and procedures.

Collateral and other credit enhancements obtained

(audited)

The Group obtained assets by taking possession of collateral held as security, or calling other credit enhancement. The nature of these assets held as at 31 December 2021 are residential properties with carrying amount of HK\$35m (2020: residential properties of HK\$24m and commercial properties of HK\$4m).

(b) Treasury Risk

Overview

Treasury risk is the risk of having insufficient capital, liquidity or funding resources to meet financial obligations and satisfy regulatory requirements, including the risk of adverse impact on earnings or capital due to structural foreign exchange exposures and changes in market interest rates, together with pension and insurance risk.

Treasury risk arises from changes to the respective resources and risk profiles driven by customer behaviour, management decisions or the external environment.

Approach and policy

Main objective in the management of treasury risk is to maintain appropriate levels of capital, liquidity, funding, foreign exchange and market risk to support business strategy, and meet regulatory and stress testing-related requirements.

The approach to treasury management is driven by our strategic and organisational requirements, taking into account the regulatory, economic and commercial environment. We aim to maintain a strong capital and liquidity base to support the risks inherent in our business and invest in accordance with our strategy, meeting both consolidated and local regulatory requirements at all times.

Our policy is underpinned by our risk management framework, our internal capital adequacy assessment process ('ICAAP') and our internal liquidity adequacy assessment process ('ILAAP'). The risk framework incorporates a number of measures aligned to our assessment of risks for both internal and regulatory purposes.

Treasury risk management

Key developments in 2021

- We have rolled out second line of defence for liquidity risk and interest rate risk of banking book during 2021. Second line of defence for capital is in progress.

- An internal liquidity metric ('ILM') was introduced during 2021 to supplement the Liquidity Coverage Ratio ('LCR') and Net Stable Funding Ratio ('NSFR') metrics.
- We enhanced our risk management of structural foreign exchange ('SFX') risk. We hedge structural foreign exchange positions where it is capital efficient to do so, and subject to approved limits.

Governance and structure

The Board approves the policy and risk appetite for Liquidity and Capital. It is supported and advised by the RC.

The Asset, Liability and Capital Management ('ALCM') team actively manages capital and liquidity risk on an on-going basis and provides support to the Asset and Liability Management Committee ('ALCO') with risk appetites overseen by the Risk Management Meeting ('RMM'). Markets Treasury has the responsibility for cash and liquidity management. It also manages structural foreign exchange risk including implementing hedging strategies approved by Chief Financial Officer and supported by ALCO.

The ALCM team further manages interest rate risk in the non-trading banking book, maintaining the transfer pricing framework and informing the ALCO the overall banking book interest rate exposure. Banking book interest rate positions may be transferred to be managed by Markets Treasury, within the market risk limits approved by the RMM.

Treasury Risk Management function carries out independent review, challenge and assurance of the appropriateness of the liquidity and IRRBB risk management activities undertaken by ALCM and Markets Treasury.

Internal Audit provides independent assurance that risk is managed effectively.

(b) Treasury Risk

Capital

Capital Management

(audited)

The Group's objective for managing capital is to maintain a strong capital base to support the development of its business and to meet regulatory capital requirements at all times. The Group recognises the impact of different level of equity capital on shareholder returns and seeks to maintain a prudent balance between advantages and flexibility provided by a strong capital position and higher returns on equity through greater leverage.

An annual Group capital plan is prepared and approved by the Board with the objectives of maintaining an optimal amount of capital and a suitable mix between different components of capital. The Group manages its own capital within the context of the approved annual capital plan, which determines the level of risk-weighted asset ('RWA') growth as well as the optimal amount and components of capital required to support planned business growth. As part of the Group's capital management policy, subsidiary with capital generated in excess of planned requirement will return to the Bank, normally by way of dividends. The Group also raised subordinated debt in accordance with HSBC Group's guidelines regarding market and investor concentration, cost, market conditions, timing and maturity profile.

The Bank is primarily a provider of equity capital to its subsidiaries. These investments are substantially funded by the Bank's own capital and profit. The Bank seeks to maintain a prudent balance between the composition of its capital and that of its investment in subsidiaries.

The principal forms of capital are included in the following balances on the Consolidated Balance Sheet: share capital, retained profits, other equity instruments and other reserves. Capital also includes impairment allowances and regulatory reserve for general banking risks as allowed under Banking (Capital) Rules.

Externally imposed capital requirements

(audited)

The HKMA supervises the Group on a consolidated and solo-consolidated basis and, as such, receives information on the capital adequacy of, and sets capital requirements for, the Group as a whole. Individual banking subsidiaries are directly regulated by their local banking supervisors, who set and monitor their capital adequacy requirements. Certain non-banking financial subsidiaries are also subject to the supervision and capital requirements of local regulatory authorities.

The Group uses the advanced internal ratings-based approach ('IRB') to calculate its credit risk for the majority of its non-securitisation exposures. For counterparty credit risk, the Group replaces the current exposure method with standardised (counterparty credit risk) approach to calculate its default risk exposures starting from 30 June 2021. For market risk, the Group uses an internal models approach to calculate its general market risk for the risk categories of interest rate and foreign exchange (including gold) exposures and the standardised (market risk) approach for calculating other market risk positions. For operational risk, the Group uses the standardised (operational risk) approach to calculate its operational risk.

During the year, the Group has complied with all of the externally imposed capital requirements by the HKMA.

Basel III

(unaudited)

The Basel III capital rules set out the minimum CET1 capital requirement of 4.5% and total capital requirement of 8%.

At 31 December 2021, the capital buffers applicable to the Group include the Capital Conservation Buffer ('CCB'), the Countercyclical Capital Buffer ('CCyB') and the Higher Loss Absorbency ('HLA') requirements for Domestic Systemically Important Banks ('D-SIB'). The CCB is 2.5% and is designed to ensure banks build up capital outside periods of stress. The CCyB is set on an individual country basis and is built up during periods of excess credit growth to protect against future losses. On 28 October 2021, the HKMA maintained the CCyB for Hong Kong at 1.0%. On 24 December 2021, the HKMA maintained the D-SIB designation as well as HLA requirement at 1% for the Group.

(b) Treasury Risk

Capital Management continued

Loss-absorbing capacity requirements

(unaudited)

The HKMA classified the Bank as a material subsidiary of HSBC's Asian resolution group in 2019 and required the Bank to comply with internal loss-absorbing capacity requirements under the Financial Institutions (Resolution) (Loss-absorbing Capacity Requirements – Banking Sector) Rules. There will be an increase in the internal loss-absorbing capacity requirements starting from 1 January 2022 and the Bank has issued non-capital loss-absorbing capacity debt instrument of HK\$5bn to its immediate holding company in the second half of the year accordingly.

Leverage ratio

(unaudited)

The leverage ratio was introduced into the Basel III framework as a non-risk-based backstop limit, to supplement risk-based capital requirements. It aims to constrain the build-up of excess leverage in the banking sector, introducing additional safeguards against model risk and measurement errors. The ratio is a volume-based measure calculated as Basel III tier 1 capital divided by total on- and off-balance sheet exposures. The minimum leverage ratio requirement in Hong Kong is 3%.

Capital base

(unaudited)

The following tables show the capital base, RWAs and capital ratios as contained in the 'Capital Adequacy Ratio' return required to be submitted to the HKMA by the Bank

on consolidated basis as specified by the HKMA under the requirements of section 3C(1) of the Banking (Capital) Rules. The basis is different from that for accounting purposes. Further information on the regulatory consolidation basis is set out in the Banking Disclosure Statement that is available in the Regulatory Disclosures section of our website www.hangseng.com.

The Bank and its subsidiaries maintain a regulatory reserve to satisfy the provisions of the Banking Ordinance and local regulatory requirements for prudential supervision purposes. At 31 December 2021, the effect of this requirement is to restrict the amount of reserves which can be distributed to shareholders by HK\$441m (2020: HK\$1,323m).

We closely monitor and consider future regulatory change and continue to evaluate the impact upon our capital requirements of regulatory developments. This includes the Basel III reforms package, over which there remains a significant degree of uncertainty due to the number of national discretions within Basel's reforms. It remains premature to provide details of an impact although we currently anticipate the potential for an increase for RWAs, driven by the output floor, in the long term.

The following table sets out the composition of the Group's capital base under Basel III at 31 December 2021 and 31 December 2020. A more detailed breakdown of the capital position and a full reconciliation between the Group's accounting and regulatory balance sheets can be viewed in the Banking Disclosure Statement in the Regulatory Disclosures section of our website www.hangseng.com.

(b) Treasury Risk**Capital Management** continued**Capital base** continued

(unaudited)

	2021	2020
Common Equity Tier 1 ('CET1') Capital		
Shareholders' equity	144,651	145,915
– Shareholders' equity per Consolidated Balance Sheet	184,332	183,100
– Additional Tier 1 ('AT1') perpetual capital instruments	(11,744)	(11,744)
– Unconsolidated subsidiaries	(27,937)	(25,441)
Non-controlling interests	–	–
– Non-controlling interests per Consolidated Balance Sheet	84	95
– Non-controlling interests in unconsolidated subsidiaries	(84)	(95)
Regulatory deductions to CET1 capital	(28,052)	(27,306)
– Cash flow hedging reserve	2	(51)
– Changes in own credit risk on fair valued liabilities	(6)	(10)
– Property revaluation reserves ¹	(24,617)	(24,067)
– Regulatory reserve	(441)	(1,323)
– Intangible assets	(2,359)	(1,566)
– Defined benefit pension fund assets	–	(6)
– Deferred tax assets net of deferred tax liabilities	(90)	(183)
– Valuation adjustments	(126)	(100)
– Excess of total expected loss amount over total eligible provisions under the IRB	(415)	–
Total CET1 Capital	116,599	118,609
AT1 Capital		
Total AT1 capital before and after regulatory deductions	11,744	11,744
– Perpetual capital instruments	11,744	11,744
Total AT1 Capital	11,744	11,744
Total Tier 1 ('T1') Capital	128,343	130,353
Tier 2 ('T2') Capital		
Total T2 capital before regulatory deductions	11,460	11,762
– Property revaluation reserves ¹	11,078	10,831
– Impairment allowances and regulatory reserve eligible for inclusion in T2 capital	382	931
Regulatory deductions to T2 capital	(1,045)	(1,045)
– Significant capital investments in unconsolidated financial sector entities	(1,045)	(1,045)
Total T2 Capital	10,415	10,717
Total Capital	138,758	141,070

¹ Includes the revaluation surplus on investment properties which is reported as part of retained profits and related adjustments made in accordance with the Banking (Capital) Rules issued by the HKMA.

(b) Treasury Risk

Capital Management continued

Risk-weighted assets by risk type

(unaudited)

	2021	2020
Credit risk	659,956	624,487
Market risk	13,248	14,332
Operational risk	60,924	66,709
Total	734,128	705,528

Capital ratios (as a percentage of risk-weighted assets)

(unaudited)

The capital ratios on consolidated basis calculated in accordance with the Banking (Capital) Rules are as follows:

	2021	2020
CET1 capital ratio	15.9%	16.8%
T1 capital ratio	17.5%	18.5%
Total capital ratio	18.9%	20.0%

In addition, the capital ratios of all tiers as of 31 December 2021 would be reduced by approximately 0.5 percentage point after the prospective fourth interim dividend payment for 2021. The following table shows the pro-forma basis position of the capital ratios after the prospective interim dividend.

	Pro-forma 2021	Pro-forma 2020
CET1 capital ratio	15.4%	16.1%
T1 capital ratio	17.0%	17.7%
Total capital ratio	18.4%	19.2%

Leverage ratio

(unaudited)

	2021	2020
Leverage ratio	7.5%	7.9%
T1 capital	128,343	130,353
Exposure measure	1,704,064	1,641,358

Detailed breakdown of the Group's leverage exposure measure and a summary comparison table reconciling the assets of the Group's accounting balance sheet with the leverage exposure measure using the standard templates

as specified by the HKMA can be viewed in the Banking Disclosure Statement in the Regulatory Disclosures section of our website www.hangseng.com.

Dividend policy

Objective

The Bank's medium to long term dividend objective is to maintain steady dividends in light of profitability, regulatory requirements, growth opportunities and the operating environment. Its roadmap is designed to generate increasing shareholders' value through strategic business growth. The Bank would balance solid yields with the longer-term reward of sustained share price appreciation.

Considerations

The declaration of dividends is made at the discretion of the Board, which will take into account all relevant factors including the following:

- regulatory requirements;
- financial results;
- level of distributable reserves;
- general business conditions and strategies;
- strategic business plan and capital plan;
- statutory and regulatory restrictions on dividend payment;
- any other factors the Board may deem relevant.

Phasing and Timing

Under normal circumstances and if the Board determines to declare a dividend at its discretion, dividends would be declared on a quarterly basis. The phasing of dividends would be planned on a prudent basis to allow for any unforeseen events, which might arise towards the end of an accounting period. Phasing of dividends would also take account of the volatility of the Bank's profits.

Other financial information

Other financial information required under the Banking (Disclosure) Rules and Financial Institutions (Resolution) (Loss-absorbing Capacity Requirements – Banking Sector) Rules can be viewed in the Banking Disclosure Statement that is available in the Regulatory Disclosures section of our website www.hangseng.com.

(b) Treasury Risk

Foreign exchange exposures

(unaudited)

Structural foreign exchange exposures represent net assets or capital investments in subsidiaries, branches or the fair value of the Group's long-term foreign currency equity investments, the functional currencies of which are currencies other than the HK dollar. An entity's functional currency is normally that of the primary economic environment in which the entity operates. The Group's structural foreign exchange exposures are managed with the primary objective of ensuring, where practical, that the Group's consolidated capital ratios and the capital ratios of individual banking subsidiaries are largely protected from the effect of changes in exchange rates.

Exchange differences on structural exposures are recognised in 'Other comprehensive income'. The Group uses Hong Kong dollar as our presentation currency in our consolidated financial statements. Therefore, our consolidated balance sheet is affected by exchange differences between Hong Kong dollar and all the non-Hong Kong dollar functional currencies of underlying subsidiaries.

The Group's foreign exchange exposures are prepared in accordance with the HKMA 'Return of Foreign Currency Position – (MA(BS)6)'.

For details of the Group's non-structural and structural foreign currency positions, please refer to the Banking Disclosure Statement that is available in the 'Regulatory Disclosures' section of the Bank's website.

Liquidity and funding risk

(audited)

Overview

Liquidity risk is the risk that we do not have sufficient financial resources to meet our obligations as they fall due or that we can only do so at an excessive cost. Liquidity risk arises from mismatches in the timing of cash flows. Funding risk is the risk that funding considered to be sustainable, and therefore used to fund assets, is not sustainable over time. Funding risk arises when illiquid asset positions cannot be funded at the expected terms and when required.

Liquidity and funding risk profile

We adopt a comprehensive Group's policies, metrics and controls which aims to allow us to withstand very severe liquidity stresses. The global policies are designed to be adaptable to changing business models, markets and regulations. They are designed to ensure that Group and entity management have oversight of our liquidity and funding risks in order to manage them appropriately.

We manage liquidity and funding risk at an operating entity level to ensure that obligations can be met in the jurisdiction where they fall due, generally without reliance on other parts of the Group. Operating entities are required to meet internal minimum requirements and any applicable regulatory requirements at all times. These requirements are set against the Group's implementation of the LCR and the NSFR. Each entity is required to undertake a qualitative and quantitative assessment of the contractual and behavioural profile of its assets and liabilities when setting internal limits in order to reflect their expected behaviour under idiosyncratic, market-wide and combined stress scenarios.

Structure and organisation

ALCM teams are responsible for the application of the Group's policies and controls at a local operating entity level. The elements of the Group's policies and controls are underpinned by a robust governance framework, the two major elements of which are:

- ALCOs at the Group and entity level; and
- annual ILAAP used to validate risk tolerance and set risk appetite.

All operating entities are required to prepare an internal liquidity adequacy assessment ('ILAA') document at appropriate frequency. The final objective of the ILAA, approved by the relevant Board of Directors, is to verify that the entity and subsidiaries maintain liquidity resources which are adequate in both amount and quality at all times, there is no significant risk that its liabilities cannot be met as they fall due, and a prudent funding profile is maintained.

The Board is ultimately responsible for determining the types and magnitude of liquidity risk that the Group is able to take and ensuring that there is an appropriate organisation structure for managing this risk. Under authorities delegated by the Executive Committee, the Group ALCO is responsible for managing all Asset, Liability and Capital Management issues including liquidity and funding risk management.

(b) Treasury Risk

Liquidity and funding risk continued

(audited)

Structure and organisation continued

The Group ALCO delegates to the Group Tactical Asset and Liability Management Committee ('TALCO') the task of reviewing various analysis of the Group pertaining to liquidity and funding.

Compliance with liquidity and funding requirements is monitored by the ALCO and is reported to the RMM, Executive Committee, RC and the Board of Directors on a regular basis. This process includes:

- maintaining compliance with relevant regulatory requirements of the reporting entity;
- projecting cash flows under various stress scenarios and considering the level of liquid assets necessary in relation thereto;
- monitoring liquidity and funding ratios against internal and regulatory requirements;
- maintaining a diverse range of funding sources with adequate back-up facilities;
- managing the concentration and profile of term funding;
- managing contingent liquidity commitment exposures within pre-determined limits;
- maintaining debt financing plans;
- monitoring depositor concentration in order to avoid undue reliance on large individual depositors and ensuring a satisfactory overall funding mix; and
- maintaining liquidity contingency plans. These plans identify early indicators of stress conditions and describe actions to be taken in the event of difficulties arising from systemic or other crises, while minimising adverse long-term implications for the business.

Governance

ALCM teams apply the Group's policies and controls at both an individual entity and Group level, and are responsible for the implementation of Group-wide and local regulatory policy at a legal entity level. Markets Treasury has responsibility for cash and liquidity management.

Treasury Risk Management carries out independent review, challenge and assurance of the appropriateness of the risk management activities undertaken by ALCM and Markets Treasury. Their work includes setting control standards, advising on policy implementation, and reviewing and challenging of reporting.

Internal Audit provide independent assurance that risk is managed effectively.

The management of liquidity and funding risk

Funding and liquidity plans form part of the financial resource plan that is approved by the Board. The critical Board risk appetite measures are the LCR and NSFR. An ILM was introduced in January 2021 to supplement the LCR and NSFR metrics. An appropriate funding and liquidity profile is managed through a wider set of measures:

- a minimum LCR requirement;
- a minimum NSFR requirement;
- an internal liquidity metric ('ILM');
- a depositor concentration limit;
- three-month and twelve-month cumulative rolling term contractual maturity limits covering deposits from banks, deposits from non-bank financial institutions and securities issued;
- a minimum LCR requirement by currency;
- intra-day liquidity;
- the application of liquidity funds transfer pricing; and
- forward-looking funding assessments.

(b) Treasury Risk

Liquidity and funding risk continued

(audited)

The management of liquidity and funding risk continued

Liquidity coverage ratio

(unaudited)

The LCR aims to ensure that a bank has sufficient unencumbered high-quality liquid assets ('HQLA') to meet its liquidity needs in a 30-calendar-day liquidity stress scenario.

At 31 December 2021, the LCR of all the Group's principal operating entities were well above regulatory minimums and above the internally expected levels established by the Board.

Net stable funding ratio

(unaudited)

The Group uses the NSFR as a basis for ensuring operating entities raise sufficient stable funding to support their business activities. The NSFR requires institutions to maintain minimum amount of stable funding based on assumptions of asset liquidity.

At 31 December 2021, the NSFR of all the Group's principal operating entities were above the internally expected levels established by the Board.

Depositor concentration and term funding maturity concentration

(unaudited)

The LCR and NSFR metrics assume a stressed outflow based on a portfolio of depositors within each deposit segment. The validity of these assumptions is challenged if the portfolio of depositors is not large enough to avoid depositor concentration. Operating entities are exposed to term refinancing concentration risk if the current maturity profile results in future maturities being overly concentrated in any defined period.

At 31 December 2021, the depositor concentration and term funding maturity concentration of all the Group's principal operating entities were within the internally expected levels established by the Board.

Sources of funding

(unaudited)

Our primary sources of funding are customer deposits. We issue wholesale securities to supplement our customer deposits and change the currency mix or maturity profile of our liabilities.

Currency mismatch in the LCR

(unaudited)

Group policy requires all operating entities to monitor material single currency LCR. Limits are set to ensure that outflows can be met, given assumptions on stressed capacity in the FX swap markets.

Single currency ILM metric will be in place from 2022 for all operating entities to monitor the cross currency funding risk.

Additional contractual obligations

(unaudited)

Under the terms of our current collateral obligations under derivative contracts (which are ISDA compliant CSA contracts), the additional collateral required to post in the event of one-notch and two-notch downgrade in credit ratings is nil.

(b) Treasury Risk

Liquidity and funding risk continued

(audited)

The management of liquidity and funding risk continued

Liquidity and funding risk in 2021

(unaudited)

The Group is required to calculate its LCR and NSFR on a consolidated basis in accordance with rule 11(1) of The Banking (Liquidity) Rules ('BLR'). The Group is required to maintain both LCR and NSFR of not less than 100%.

The average LCRs for the periods are as follows:

	Quarter ended							
	31 Dec 2021	30 Sep 2021	30 Jun 2021	31 Mar 2021	31 Dec 2020	30 Sep 2020	30 Jun 2020	31 Mar 2020
Average LCR	191.8%	203.2%	214.4%	204.0%	207.8%	199.4%	198.0%	181.6%

The liquidity position of the Group remained strong in 2021. The average LCR ranged from 191.8% to 214.4% for the reportable quarters. The LCR at 31 December 2021 was 192.7% (230.4% at 31 December 2020).

The composition of the Group's HQLA as defined under Schedule 2 of the BLR is shown as below. The majority of the HQLA held by the Group are Level 1 assets which consist mainly of government debt securities.

	Weighted value (average) for the quarter ended							
	31 Dec 2021	30 Sep 2021	30 Jun 2021	31 Mar 2021	31 Dec 2020	30 Sep 2020	30 Jun 2020	31 Mar 2020
Level 1 assets	350,120	342,427	355,092	377,648	384,837	356,059	315,876	297,826
Level 2A assets	17,013	15,138	15,464	14,301	14,498	15,031	15,415	15,056
Level 2B assets	2,321	2,445	3,073	2,169	2,563	2,092	1,795	1,224
Total	369,454	360,010	373,629	394,118	401,898	373,182	333,086	314,106

In accordance with the Banking (Liquidity) Rules, the Net Stable Funding Ratio ('NSFR') was implemented in Hong Kong with effect from 1 January 2018. The Group is required to calculate NSFR on a consolidated basis and maintain a NSFR of not less than 100%.

The NSFR for the reportable periods are as follows:

	At quarter ended							
	31 Dec 2021	30 Sep 2021	30 Jun 2021	31 Mar 2021	31 Dec 2020	30 Sep 2020	30 Jun 2020	31 Mar 2020
NSFR	147.4%	146.6%	146.6%	150.5%	152.9%	149.2%	151.0%	146.0%

The funding position of the Group remained strong and stable in 2021. The NSFR was 147.4% for the quarter ended 31 December 2021 (152.9% as at 31 December 2020), highlighting a surplus of available stable funding relative to the required stable funding requirement.

To comply with the Banking (Disclosure) Rules, the details of liquidity information can be found in the Regulatory Disclosures section of our website www.hangseng.com.

(b) Treasury Risk**Liquidity and funding risk** continued

(audited)

Analysis of cash flows payable under financial liabilities by remaining contractual maturities

(audited)

	Within 1 month	Over 1 month but within 3 months	Over 3 months but within 1 year	Over 1 year but within 5 years	Over 5 years	Total
At 31 December 2021						
Deposits from banks	5,333	–	–	–	–	5,333
Current, savings and other deposit accounts	1,116,989	83,461	27,914	2,362	–	1,230,726
Repurchase agreements – non-trading	13,393	729	1,683	812	–	16,617
Trading liabilities	44,291	–	–	–	–	44,291
Derivative financial instruments	11,889	69	249	106	–	12,313
Financial liabilities designated at fair value	8,160	9,953	9,056	15	377	27,561
Certificates of deposit and other debt securities in issue	19,709	23,018	39,060	–	–	81,787
Other financial liabilities	16,746	6,604	4,911	1,209	271	29,741
Subordinated liabilities	–	100	327	12,664	13,572	26,663
	1,236,510	123,934	83,200	17,168	14,220	1,475,032
Loan commitments	514,920	–	–	–	–	514,920
Financial guarantee and credit risk related guarantee contracts	28,950	–	–	–	–	28,950
	543,870	–	–	–	–	543,870
At 31 December 2020						
Deposits from banks	11,273	–	1,676	–	–	12,949
Current, savings and other deposit accounts	1,086,458	97,646	25,171	830	–	1,210,105
Repurchase agreements – non-trading	4,178	–	1,475	635	–	6,288
Trading liabilities	30,937	–	–	–	–	30,937
Derivative financial instruments	18,923	221	610	1,078	–	20,832
Financial liabilities designated at fair value	12,972	9,809	9,119	348	416	32,664
Certificates of deposit and other debt securities in issue	3,290	20,471	38,293	706	–	62,760
Other financial liabilities	17,920	6,059	3,587	1,507	268	29,341
Subordinated liabilities	–	88	288	7,593	13,810	21,779
	1,185,951	134,294	80,219	12,697	14,494	1,427,655
Loan commitments	499,493	–	–	–	–	499,493
Financial guarantee and credit risk related guarantee contracts	19,847	–	–	–	–	19,847
	519,340	–	–	–	–	519,340

(b) Treasury Risk

Liquidity and funding risk continued

(audited)

Analysis of cash flows payable under financial liabilities by remaining contractual maturities continued

(audited)

The balances in the above tables incorporate all cash flows relating to principal and future coupon payments on an undiscounted basis (except for trading liabilities and trading derivatives). Trading liabilities and trading derivatives have been included in the 'Within one month' time bucket as trading liabilities are typically held for short periods of time. The undiscounted cash flows payable under hedging derivative liabilities are classified according to their contractual maturity. Investment contract liabilities have been included in financial liabilities designated at fair value, whereby the policyholders have the option to surrender or transfer at any time, and are reported in the 'Over five years' time bucket. A maturity analysis prepared on the basis of the earliest possible contractual repayment date (assuming that all surrender and transfer options are exercised) would result in all investment contracts being presented as falling due within one year or less. The undiscounted cash flows potentially payable under loan commitments and financial guarantee contracts are classified on the basis of the earliest date they can be called. Cash flows payable in respect of customer accounts are primarily contractually repayable on demand or at short notice.

Interest Rate Risk in the Banking Book

(unaudited)

Interest rate risk in the banking book is the risk of an adverse impact to earnings or capital due to changes in market interest rates. It is generated by our non-traded assets and liabilities, specifically loans, deposits and financial instruments that are not held for trading intent or held in order to hedge positions held with trading intent. Interest rate risk that can be economically hedged may be transferred to the Markets Treasury business. Hedging is generally executed through interest rate derivatives or fixed-rate government bonds. Any interest rate risk that Markets Treasury cannot economically hedge is not transferred and will remain within the global business where the risks originate.

The ALCM function uses a number of measures to monitor and control interest rate risk in the banking book, including:

- net interest income sensitivity; and
- economic value of equity sensitivity.

Net interest income sensitivity

(audited)

A principal part of our management of non-traded interest rate risk is to monitor the sensitivity of expected net interest income ('NII') under varying interest rate scenarios (i.e. simulation modelling), where all other economic variables are held constant. This monitoring is undertaken at an entity level by local ALCOs, where entities calculate both one-year and five-year NII sensitivities across a range of interest rate scenarios.

The table below sets out the effect on future net interest income of 100 basis points parallel rises or falls in all yield curves at the beginning of year from 1 January 2022 and 25 basis points parallel rises or falls in all yield curves at the beginning of year from 1 January 2022.

Assuming no management actions and all other non-interest rate risk variables remain constant, such a series of parallel rises in all yield curves would increase expected net interest income for the year ended 31 December 2022 by HK\$6,360m for 100 basis points case and by HK\$1,904m for 25 basis points case, while such a series of parallel falls in all-in yield curves would decrease expected net interest income by HK\$5,155m for 100 basis points case and by HK\$1,893m for 25 basis points case.

(b) Treasury Risk

Interest Rate Risk in the Banking Book continued

(unaudited)

Net interest income sensitivity continued

(audited)

The expected net interest income sensitivity is described as follows:

	100bp parallel increase	100bp parallel decrease	25bp parallel increase	25bp parallel decrease
Change in 2022 expected net interest income				
HKD	4,422	(3,392)	1,383	(1,394)
USD	1,110	(870)	302	(290)
Other	828	(893)	219	(209)
Total	6,360	(5,155)	1,904	(1,893)
Change in 2021 expected net interest income				
HKD	2,679	(1,311)	670	(759)
USD	411	(694)	103	(230)
Other	1,069	(1,131)	268	(273)
Total	4,159	(3,136)	1,041	(1,262)

NII sensitivity figures set out in the table above represent the effect of pro forma movements in projected yield curves based on a static balance sheet size and structure. The exception to this is where the size of the balances or repricing is deemed interest rate sensitive, for example, non-interest-bearing current account migration and fixed-rate loan early prepayment. These sensitivity calculations do not incorporate actions that would be taken by Markets Treasury or in the business that originates the risk to mitigate the effect of interest rate movements.

The NII sensitivity calculations assume that interest rates of all maturities move by the same amount in the 'up-shock' scenario. The sensitivity calculations in the 'down-shock' scenarios reflect no floors to the shocked market rates. However, customer product-specific interest rate floors are recognised where applicable.

Economic value of equity sensitivity

Economic value of equity ('EVE') represents the present value of the future banking book cash flows that could be distributed to equity holders under a managed run-off scenario. This equates to the current book value of equity plus the present value of future NII in this scenario. EVE can be used to assess the economic capital required to support interest rate risk in the banking book. An EVE sensitivity represents the expected movement in EVE due to pre-specified interest rate shocks, where all other economic variables are held constant. Operating entities are required to monitor EVE sensitivities as a percentage of capital resources.

The Group's EVE sensitivity is prepared in accordance with the HKMA 'Return of Interest Rate Risk Exposure – (MA(BS)12A)'. For details of the Group's EVE sensitivity, please refer to the Banking Disclosure Statement that will be available in the 'Regulatory Disclosures' section of the Bank's website.

(b) Treasury Risk

Interest Rate Risk in the Banking Book continued (unaudited)

Sensitivity of reserves

The Group monitors the sensitivity of reported cash flow hedge reserves to interest rate movements on a quarterly basis by assessing the expected reduction in valuation of

cash flow hedge due to parallel movements of plus or minus 100bps in all yield curves. These particular exposures form only a part of the Group's overall interest rate risk exposures.

The following table describes the sensitivity of reported cash flow hedge reserves to the stipulated movements in yield curves. The sensitivities are indicative and based on simplified scenarios.

	At 31 December 2021	Maximum impact	Minimum impact
+ 100 basis points parallel move in all yield curves	(52)	(52)	(35)
As a percentage of shareholders' equity at 31 December 2021 (%)	(0.03)	(0.03)	(0.02)
- 100 basis points parallel move in all yield curves	69	71	41
As a percentage of shareholders' equity at 31 December 2021 (%)	0.04	0.04	0.02
	At 31 December 2020	Maximum impact	Minimum impact
+ 100 basis points parallel move in all yield curves	(51)	(76)	(51)
As a percentage of shareholders' equity at 31 December 2020 (%)	(0.03)	(0.04)	(0.03)
- 100 basis points parallel move in all yield curves	98	251	98
As a percentage of shareholders' equity at 31 December 2020 (%)	0.05	0.14	0.05

(c) Market risk

Overview

Market risk is the risk that movements in market factors, such as foreign exchange rates, interest rates, credit spreads, equity prices and commodity prices, will reduce our income or the value of our portfolios.

Exposure to market risk is separated into two portfolios: trading portfolios and non-trading portfolios.

Key developments in 2021

There were no material changes to our policies and practices for the management of market risk in 2021.

Governance and structure

The following diagram summarises the main business areas where trading and non-trading market risks reside and market risk measures to monitor and limit exposures.

(c) Market risk

Governance and structure continued

Risk Type	Trading Risk	Non-Trading Risk
	<ul style="list-style-type: none"> – Foreign exchange & Commodities – Interest rates – Credit spreads 	<ul style="list-style-type: none"> – Foreign exchange – Interest rates – Credit spreads
Risk Measure	Value at risk/Sensitivity analysis/Stress testing	Value at risk/Sensitivity analysis/Stress testing

Where appropriate, the Group applies similar risk management policies and measurement techniques to both trading and non-trading portfolios. The Group's objective is to manage and control market risk exposures to optimise return on risk while maintaining a market profile consistent with the established risk appetite.

Market risk governance

(audited)

Market risk is managed and controlled through limits approved by the Group Board of Directors. These limits are allocated across business lines and to the Group's legal entities.

The Group has an independent market risk management and control sub-function, which is responsible for measuring, monitoring and reporting market risk exposures against limits on a daily basis. Each operating entity is required to assess the market risks arising in its business and to transfer them either to its Global Markets for management, or to separate books managed under the supervision of the Asset and Liability Management Committee ('ALCO').

The Traded Risk function enforces the controls around trading in permissible instruments approved for each site as well as changes that follow completion of the new product approval process. Trading Risk also restricts trading in the more complex derivatives products to offices with appropriate levels of product expertise and robust control systems.

Key risk management processes

(unaudited)

Monitoring and limiting market risk exposures

The Group's objective is to manage and control market risk exposures while maintaining a market profile consistent with the Group's risk appetite. The Group uses a range of tools to monitor and limit market risk exposures including sensitivity analysis, value at risk ('VaR') and stress testing.

Sensitivity analysis

(unaudited)

Sensitivity analysis measures the impact of individual market factor movements on specific instruments or portfolios including interest rates, foreign exchange rates and equity prices. The Group uses sensitivity measures to monitor the market risk positions within each risk type. Granular sensitivity limits are set for trading desks with consideration of market liquidity, customer demand and capital constraints, among other factors.

(c) Market risk

Key risk management processes continued

(unaudited)

Value at risk ('VaR')

VaR is a technique for estimating potential losses on risk positions as a result of movements in market rates and prices over a specified time horizon and to a given level of confidence. The use of VaR is integrated into market risk management and calculated for all trading positions regardless of how the Group capitalises them. In addition, the Group calculates VaR for non-trading portfolios to have a complete picture of risk. Where VaR is not calculated explicitly, the Group uses alternative tools as summarised in the 'Stress testing' section below.

The VaR models used by the Group are predominantly based on historical simulation that incorporates the following features:

- historical market rates and prices, which are calculated with reference to foreign exchange rates, commodity prices, interest rates, equity prices and the associated volatilities;
- potential market movements that are calculated with reference to data from the past two years;
- Standard VaR is calculated to a 99% confidence level and using a one-day holding period; and
- Stressed VaR uses a 10-day holding period and a 99% confidence interval based on a continuous one-year historical significant stress period.

The models also incorporate the effect of the option features on the underlying exposures. The nature of the VaR models means that an increase in observed market volatility will lead to an increase in VaR without any changes in the underlying positions.

VaR model limitations

Although a valuable guide to risk, VaR is used with awareness of its limitations. For example:

- the use of historical data as a proxy for estimating future market moves may not encompass all potential market events, particularly those that are extreme in nature;
- the use of a one-day holding period for risk management purposes of trading and non-trading books assumes that this short period is sufficient to hedge or liquidate all positions;

- the use of a 99% confidence level by definition does not take into account losses that might occur beyond this level of confidence; and
- VaR is calculated on the basis of exposures outstanding at the close of business and therefore does not reflect intra-day exposures.

Risk not in VaR ('RNIV') framework

(unaudited)

The risks not in VaR ('RNIV') framework captures and capitalises material market risks that are not adequately covered in the VaR model.

Risk factors are reviewed on a regular basis and are either incorporated directly in the VaR models, where possible, or quantified through either the VaR-based RNIV approach or a stress test approach within the RNIV framework. While VaR-based RNIVs are calculated by using historical scenarios, stress-type RNIVs are estimated on the basis of stress scenarios whose severity is calibrated to be in line with the capital adequacy requirements.

Stress testing

(audited)

Stress testing is an important procedure that is integrated into the Group's market risk management framework to evaluate the potential impact on portfolio values of more extreme, although plausible, events or movements in a set of financial variables. In such scenarios, losses can be much greater than those predicted by VaR modelling.

Stress testing is implemented at legal entity and overall Group levels. A scoring framework is in place for management to effectively assess the severity of the potential stress losses and the likelihood of occurrence of the stress scenarios. The risk appetite around potential stress losses for the Group is set and monitored against a referral limit.

Market risk reverse stress tests are designed to identify vulnerabilities in our portfolios by looking for scenarios that lead to loss levels considered severe for the relevant portfolio. These scenarios may be quite local or idiosyncratic in nature, and complement the systematic top-down stress testing.

Stress testing and reverse stress testing provide senior management with insights regarding the 'tail risk' beyond VaR, for which risk appetite is limited.

(c) Market risk

Trading portfolios

Trading portfolios comprise positions held for client servicing and market-making, with the intention of short-term resale and/or to hedge risks resulting from such positions.

Market risk in 2021

(unaudited)

Financial markets were resilient in 2021. During the first half of the year, the rollout of COVID vaccination programmes, loose financial conditions and continued fiscal support contributed to a gradual reopening of major economies. Concerns of rising inflationary pressures were mainly interpreted as transitory. Whilst the path of monetary policies remained uncertain, central banks continued to provide liquidity. This supported risk assets valuations, while volatility in most asset classes remained subdued. In the second half of 2021, amid the emergence of new COVID variants, global equities reached further record highs, as investors focused on global economic resilience and corporate earnings. Yields followed a downward trend for most of 3Q-21, before reversing in the final weeks of the year, when markets began pricing in a faster

pace of interest rate rise in some of the major economies, due to persistently elevated inflation and the expectation of a tighter monetary policies. Credit markets remained strong, with credit benchmark indices for investment-grade and high-yield debt close to pre-pandemic levels. Nevertheless, a wave of volatility and uncertainty in the Chinese property sector due to liquidity crunch resulting in numerous rating downgrades and defaults during second half of 2021.

The Group continued to manage market risk prudently during 2021. Sensitivity exposures and VaR remained within appetite as the business pursued its core market-making activity in support of our customers. Market risk was managed using a complementary set of risk measures and limits, including stress and scenario analysis.

Trading portfolios

(unaudited)

Value at risk of the trading portfolios

The Trading VaR at 31 December 2021 decreased when compared against 31 December 2020, mainly driven by the decrease in foreign exchange trading positions. In average terms, the VaR level was also lower in 2021.

The Group's trading VaR for the year is shown in the table below.

Trading, 99% 1 day

(audited)

	At 31 December 2021	Minimum during the year	Maximum during the year	Average for the year
VaR				
Trading	31	26	55	40
Foreign exchange trading	3	3	28	20
Interest rate trading	31	24	51	35
Portfolio diversification	(3)	–	–	(15)
	At 31 December 2020	Minimum during the year	Maximum during the year	Average for the year
VaR				
Trading	43	29	58	42
Foreign exchange trading	23	21	35	26
Interest rate trading	30	19	45	31
Portfolio diversification	(10)	–	–	(15)

¹ Trading portfolios comprise positions arising from the market-making and warehousing of customer-derived positions.

² Portfolio diversification is the market risk dispersion effect of holding a portfolio containing different risk types. It represents the reduction in unsystematic market risk that occurs when combining a number of different risk types, for example, interest rate and foreign exchange, together in one portfolio. It is measured as the difference between the sum of the VaR by individual risk type and the combined total VaR. A negative number represents the benefit of portfolio diversification. As the maximum and minimum occur on different days for different risk types, it is not meaningful to calculate a portfolio diversification benefit for these measures.

(c) Market risk

Trading portfolios continued

(unaudited)

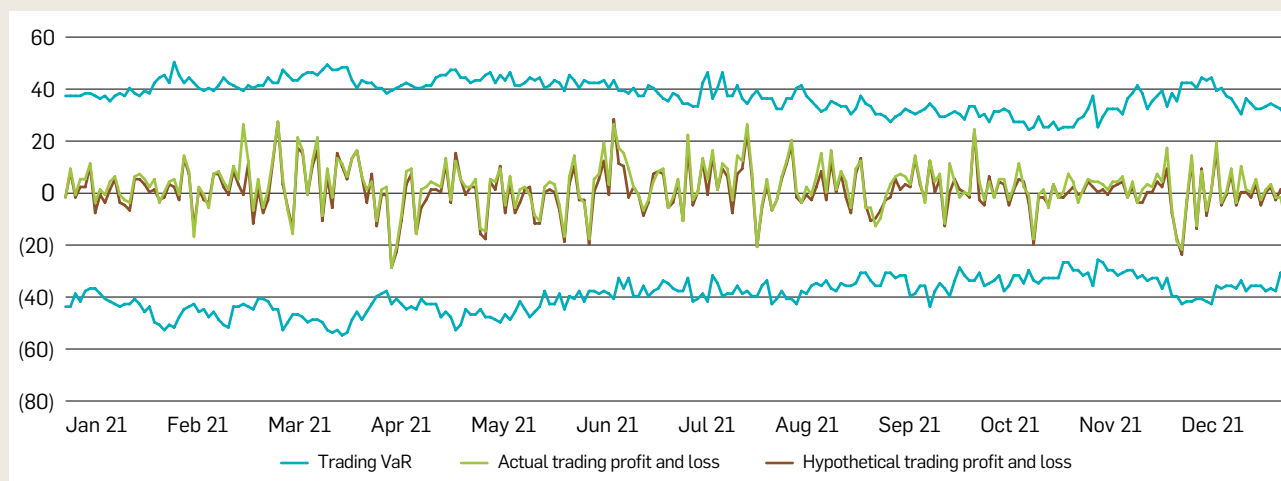
Backtesting

(unaudited)

In 2021, there was no profit or loss exception at the Group consolidated level.

The graph below shows the daily trading VaR against actual and hypothetical profit and loss for the Group during 2021.

Backtesting of trading VaR against actual and hypothetical profit and loss for 2021 (HK\$m)



The Group routinely validates the accuracy of the VaR models by back-testing them with both actual and hypothetical profit and loss. Hypothetical profit and loss excludes non-modelled items such as fees, commissions and revenues of intra-day transactions.

The number of back-testing exceptions is used to gauge how well the models are performing. The Group considers enhanced internal monitoring of a VaR model if more than five loss exceptions occur in a 250-day period.

Equities exposures

(audited)

The Group's equities exposures in 2021 and 2020 are reported as 'Financial assets designated and otherwise mandatorily measured at fair value through profit or loss', 'Financial investments' and 'Trading assets' in the consolidated financial statements. These are subject to trading limit and risk management control procedures and other market risk regime.

(d) Resilience risk

(unaudited)

Overview

Resilience risk is the risk that we are unable to provide critical services to our customers, affiliates and counterparties, as a result of sustained and significant operational disruption. Resilience risk arises from failures or inadequacies in processes, people, systems or external events.

Resilience risk management

Key developments in 2021

The Operational and Resilience Risk sub-function provides robust non-financial risk steward oversight of the management of risk by the Group businesses, functions and legal entities. It also provides effective and timely independent challenge. During the year there are a number of initiatives to strengthen the management of non-financial risks:

- Updating material risk taxonomy and control libraries and refreshing material risk and control assessment for a more robust understanding of our risk and control environment.
- Enabling better analysis and reporting of non-financial risks through access to a wider range of management information on risks and controls.
- Increasing risk stewards capability by training to allow for effective stewardship.
- Strengthening the read across of issues and near misses by implementing Group-wide harmonised approach across businesses and functions.
- Enhancing the risk management oversight across our most material change initiatives to support growth in our strategic transformation.

We prioritise our efforts on material risks and areas undergoing strategic growth, aligning our location strategy to this need.

Governance and structure

The Operational and Resilience Risk target operating model provides a globally consistent view across resilience risks, strengthening our risk management oversight while operating effectively as part of a simplified non-financial risk structure. We view resilience risk across seven risk types related to: third parties and supply chains; information, technology and cybersecurity; payments and manual processing; physical security; business interruption and contingency risk; building unavailability; and workplace safety.

Key risk management processes

Operational resilience is our ability to anticipate, prevent, adapt, respond to, recover and learn from internal or external disruption, protecting customers, the markets we operate in and economic stability. Resilience is determined by assessing whether we are able to continue to provide our most important services, within an agreed level. We accept we will not be able to prevent all disruption, we prioritise investment to continually improve the response and recovery strategies for our most important business services.

Business operations continuity

Business Continuity, in response to the COVID-19 pandemic, remains in place across a number of locations where the Group operates, allowing the majority of service level agreements to be maintained. There were no significant impacts to service delivery.

(e) Regulatory Compliance Risk

(unaudited)

Overview

Regulatory compliance risk is the risk that we fail to observe the letter and spirit of all relevant laws, codes, rules, regulations and standards of good market practice, and incur fines and penalties and suffer damage to our business as a consequence.

The Regulatory Compliance function provides independent, objective oversight and challenge and promotes a compliance oriented culture, supporting the business in delivering fair outcomes for customers, maintaining the integrity of financial markets and achieving the Group's strategic objectives.

Key developments in 2021

There were no material changes to the policies and practices for the management of regulatory compliance risk in 2021, except for the initiatives that we undertook to raise our standards in relation to the conduct of our business, as described below under 'Conduct of business'.

Governance and structure

Regulatory Compliance is part of the Compliance function and provides guidance and advice to business and functions.

Key risk management processes

We regularly review our policies and procedures. Global policies and procedures require the prompt identification and escalation of any actual or potential regulatory breach to Regulatory Compliance. Reportable events are escalated to the RMM and RC, as appropriate.

Conduct of business

In 2021, we continued to take steps to raise our standards relating to conduct, which included:

- delivering further mandatory conduct training to all employees;
- incorporating the assessment of expected values and behaviours as key determinants in recruitment, performance appraisal and remuneration processes;
- improving our market surveillance capability;
- introducing policies and procedures to strengthen support for potentially vulnerable customers;
- enhancing the quality and depth of conduct management information and how it is used across the Bank;
- implementing an assessment process to check the effectiveness of our conduct initiatives across the Bank; and
- assessing conduct standards and practices within our key third party suppliers and distributors.

(f) Financial Crime Risk

(unaudited)

Overview

Financial crime risk is the risk that we knowingly or unknowingly help parties to commit or to further potentially illegal activity through the Bank, including money laundering, fraud, bribery and corruption, tax evasion, sanctions breaches, and terrorist and proliferation financing.

Financial crime risk management

Key developments in 2021

We consistently review the effectiveness of our financial crime risk management framework, which includes consideration of geopolitical and wider economic factors, and 2021 was no exception. We continued to support Business in navigating the complex and dynamic nature of geopolitics as it relates to sanctions and export control risk. A key focus area in this regard relates to the array of new regulations and designations in 2021 and in alignment with our policy, which is to comply with all applicable sanctions regulations in the jurisdictions in which we operate.

We also continued to progress several key financial crime risk management initiatives, including:

- We strengthened our anti-fraud capabilities, notably with respect to the early identification of first party lending fraud and the identification of new strategic detection tools.
- We continued to develop leading-edge surveillance technology and capabilities to identify potential market abuse, including testing machine learning capabilities to detect unauthorised trading.
- We invested in the use of artificial intelligence (AI) and advanced analytics techniques to manage financial crime risk, notably new automated capabilities in name and transaction screening.
- We implemented a market leading gifts and entertainment recording and approval system, which, in combination with an expenses reconciliation tool, allows us to manage our gifts and entertainment risk consistently and effectively.

Governance and structure

Since establishing a global framework of Financial Crime Risk Management Committees in 2018, we have continued to strengthen and review the effectiveness of our governance framework to manage financial crime risk. They help to enable compliance with the letter and the spirit of all applicable financial crime compliance laws and regulations, as well as our own standards, values and policies relating to financial crime risks. The Financial Crime Risk Management Meeting, chaired by the Chief Executive, has served as the pinnacle of this governance structure, ultimately responsible for the management of financial crime risk. As a reflection of the growing maturity and effectiveness of our financial crime risk management, this meeting was integrated with the Risk Management Meeting in May 2021.

During 2021, we redesigned and delivered an integrated operating model for our Compliance function, with the accompanying restructure providing greater accountability to our Compliance team. This team, led by the Chief Compliance Officer, will support the Bank in aligning the way in which we manage all compliance risks, including financial crime risk, to the needs and aims of the wider business. They will support making our compliance risk management processes and procedures more efficient and effective.

Key risk management processes

We assess the effectiveness of our end-to-end financial crime risk management framework on an ongoing basis and invest in enhancing our operational control capabilities and technology solutions to deter and detect criminal activity. We have simplified our framework by streamlining and de-duplicating policy requirements. We also strengthened our financial crime risk taxonomy and control libraries, improving our investigative and monitoring capabilities through technology deployments, as well as developing more targeted metrics. We have also enhanced governance and reporting.

We are committed to working in partnership with the wider industry and the public sector in managing financial crime risk, protecting the integrity of the financial system and the communities we serve. We also participate in public-private partnerships and information-sharing initiatives.

(g) Model risk

(unaudited)

Overview

Model risk is the risk of inappropriate or incorrect business decisions arising from the use of models that have been inadequately designed, implemented or used, or from models that do not perform in line with expectations and predictions.

Key developments in 2021

Redeveloped critical Internal Rating Based (IRB) Approach models for credit risk were validated and submitted to the HKMA. These new models have been built to enhance standards using improved data.

Models impacted by changes to alternative rate setting mechanisms due to IBOR transition were redeveloped and validated.

Further enhancements to the control framework for Sarbanes-Oxley were made to address the control weaknesses that emerged as a result of significant increases in model adjustments and overlays that were applied to compensate for the impact of COVID-19 on models and to introduce a requirement for second line to approve material models prior to use.

Model owners in Business and Functions continued to embed the requirements included in the HSBC Group Model Risk Policy and Standards introduced in 2020.

New Model Risk Appetite measure was rolled out, which is more forward looking and helped Businesses and Functions manage model risk more effectively.

Key risk management processes

A variety of modelling approaches, including regression, simulation, sampling, machine learning and judgemental scorecards for a range of business applications are used. These activities include customer selection, product pricing, financial crime transaction monitoring, creditworthiness evaluation and financial reporting.

Model risk management policies and procedures are regularly reviewed, and required the First Line of Defence to demonstrate comprehensive and effective controls.

We report on model risk to senior management on a regular basis through the use of the risk map, risk appetite metric and regular key updates.

The effectiveness of our model oversight structure are regularly reviewed to ensure appropriate understanding and ownership of model risk continued to be embedded in the Businesses and Functions.

(h) Insurance manufacturing operation risk

(audited)

Risk management objectives and policies for management of insurance risk

The majority of the risk in the insurance business derives from manufacturing activities and can be categorised as insurance risk and financial risk. Financial risks include market risk, credit risk and liquidity risk. Insurance risk is the risk, other than financial risk, of loss transferred from the holder of the insurance contract to the insurer.

Group's bancassurance model

We operate an integrated bancassurance model which provides insurance products principally for customers with whom we have a banking relationship. The insurance contracts we sell relate to the underlying needs of our banking customers, which we can identify from our point-of-sale contacts and customer knowledge. For the products we manufacture, the majority of sales are of savings and investment products.

By focusing largely on personal and SME lines of business we are able to optimise volumes and diversify individual insurance risks.

We choose to manufacture these insurance products in a Group subsidiary based on an assessment of operational scale and risk appetite. Manufacturing insurance allows us to retain the risks and rewards associated with writing insurance contracts by keeping part of the underwriting profit and investment income within the Group.

Where we do not have the risk appetite or operational scale to be an effective insurance manufacturer, we engage with a handful of leading external insurance companies in order to provide insurance products to our customers through our banking network and direct channels. These arrangements are generally structured with our exclusive strategic partners and earn the Group a combination of commissions, fees and a share of profits. We distribute insurance products in Hong Kong, China and Macau.

Insurance products are sold through all global businesses, but predominantly by WPB and CMB through our branches and direct channels.

Governance

Insurance risks are managed to a defined risk appetite, which is aligned to the Group's risk appetite and risk management framework (including the three lines of defence model). The Insurance Risk Management Meeting oversees the control framework and is accountable to the Group Risk Management Meeting on risk matters relating to insurance business.

The monitoring of the risks within the insurance operations is carried out by the Insurance Risk teams. Specific risk functions, including wholesale credit & market risk, operational risk, information security risk and compliance, support Insurance Risk teams in their respective areas of expertise.

Measurement

The risk profile of our insurance manufacturing businesses is measured using an economic capital ('EC') approach. Assets and liabilities are measured on a market value basis and a capital requirement is defined to ensure that there is a less than 1 in 200 chance of insolvency over a one year time horizon, given the risks that the businesses are exposed to. The methodology for the economic capital calculation is largely aligned to the pan-European Solvency II insurance capital regulation. The EC coverage ratio (economic net asset value divided by the economic capital requirement) is a key risk appetite measure. Management has set out the risk appetite and tolerance level in which management actions are required. In addition to EC, the regulatory solvency ratio is also a metric used to manage risk appetite on an entity basis.

(h) Insurance manufacturing operation risk

(audited)

The following table shows the composition of assets and liabilities by contract type.

Balance sheet of insurance manufacturing subsidiary by type of contract

	Linked contracts ¹	Non-linked contracts ¹	Other assets and liabilities ²	Total
2021				
Financial assets:				
– financial assets designated and otherwise mandatorily measured at fair value through profit or loss	180	31,043	–	31,223
– derivative financial instruments	–	411	–	411
– financial investments	–	123,381	6,126	129,507
– other financial assets	46	9,786	571	10,403
Total financial assets	226	164,621	6,697	171,544
Reinsurers' share of liabilities under insurance contracts	–	5,848	–	5,848
Present value of in-force long-term insurance contracts	–	–	22,363	22,363
Other assets	–	6,291	1,298	7,589
Total assets	226	176,760	30,358	207,344
Liabilities under investment contracts designated at fair value	114	269	–	383
Liabilities under insurance contracts	71	154,480	–	154,551
Deferred tax	–	9	3,755	3,764
Derivative financial instruments	–	286	–	286
Other liabilities	–	–	13,960	13,960
Total liabilities	185	155,044	17,715	172,944
Shareholders' equity	–	–	34,400	34,400
Total liabilities and shareholders' equity	185	155,044	52,115	207,344
2020				
(re-presented) ³				
Financial assets:				
– financial assets designated and otherwise mandatorily measured at fair value through profit or loss	199	20,419	–	20,618
– derivative financial instruments	–	439	–	439
– financial investments	–	116,983	6,177	123,160
– other financial assets	39	8,365	263	8,667
Total financial assets	238	146,206	6,440	152,884
Reinsurers' share of liabilities under insurance contracts	–	5,471	–	5,471
Present value of in-force long-term insurance contracts	–	–	22,551	22,551
Other assets	–	6,203	1,313	7,516
Total assets	238	157,880	30,304	188,422
Liabilities under investment contracts designated at fair value	137	282	–	419
Liabilities under insurance contracts	69	142,611	–	142,680
Deferred tax	–	9	3,776	3,785
Derivative financial instruments	–	184	–	184
Other liabilities	–	–	9,558	9,558
Total liabilities	206	143,086	13,334	156,626
Shareholders' equity	–	–	31,796	31,796
Total liabilities and shareholders' equity	206	143,086	45,130	188,422

¹ Comprises life insurance contracts and investment contracts.

² Comprises shareholder assets and liabilities.

³ Comparative figures have been re-presented to conform with current year's presentation.

(h) Insurance manufacturing operation risk

(audited)

Stress and Scenario Testing

Stress testing forms a key part of the risk management framework for the insurance business. We participate in regulatory stress tests, including the Bank of England stress test of the banking system, the Hong Kong Monetary Authority stress test, and Hong Kong Insurance Authority stress test. These have highlighted that a key risk scenario for the insurance business is a prolonged low interest rate environment. In order to mitigate the impact of this scenario, the insurance subsidiary has a range of strategies that could be employed including repricing current products to reflect lower interest rates, moving towards less capital intensive products, and developing investment strategies to optimise the expected returns against the required capital.

Key Risk Types

The key risks for the insurance operations are market risks (in particular interest rate and equity), and credit risks, followed by insurance underwriting risk and operational risks. Liquidity risk, while more significant for the banking business, is minor for our insurance subsidiary.

Market risk (insurance)

Market risk is the risk of changes in market factors affecting the Group's capital or profit. Market factors include interest rates, equity and growth assets, spread risk and foreign exchange rates.

Our exposure varies depending on the type of contract issued. Our most significant life insurance products are contracts with discretionary participating features ('DPF') issued in Hong Kong. These products typically include some form of capital guarantee or guaranteed return, on the sums invested by the policyholders, to which discretionary bonuses are added if allowed by the overall performance of the funds. These funds are primarily invested in bonds with a proportion allocated to other asset classes, to provide customers with the potential for enhanced returns.

DPF products expose the Group to the risk of variation in asset returns, which will impact our participation in the investment performance. In addition, in some scenarios the asset returns can become insufficient to cover the policyholders' financial guarantees, in which case the shortfall has to be met by the Group. Allowances are made against the cost of such guarantees, calculated by stochastic modelling.

For unit-linked contracts, market risk is substantially borne by the policyholders, but some market risk exposure typically remains as fees earned are related to the market value of the linked assets.

Our insurance manufacturing subsidiary has market risk mandates which specify the investment instruments in which they are permitted to invest and the maximum quantum of market risk which they may retain. They manage market risk by using, among others, some or all of the techniques listed below, depending on the nature of the contracts written:

- for products with DPF, adjusting bonus rates to manage the liabilities to policyholders. The effect is that a significant portion of the market risk is borne by the policyholders;
- asset and liability matching where asset portfolios are structured to support projected liability cash flows. The Group manages its assets using an approach that considers asset quality, diversification, cash flow matching, liquidity, volatility and target investment return. It is not always possible to match asset and liability durations, due to several factors such as uncertainty over the receipt of all future premiums and the timing of claims and the forecast payment dates of liabilities may exceed the duration of the longest dated investments available. We use models to assess the effect of a range of future scenarios on the values of financial assets and associated liabilities, and ALCO employs the outcomes in determining how best to structure asset holdings to support liabilities;
- using derivatives to protect against adverse market movements or better support liability cash flows;
- for new products with investment guarantees, considering the cost when determining the level of premiums or the price structure;
- periodically reviewing products identified as higher risk, which contain investment guarantees and embedded optionality features linked to savings and investment products for active management;
- designing new products to mitigate market risk, such as changing the investment return sharing portion between policyholders and the shareholder, using Terminal Bonus feature instead of annual dividend, lower the level of guaranteed returns, etc;
- exiting, to the extent possible, investment portfolios whose risk is considered unacceptable; and
- repricing premiums charged to policyholders.

(h) Insurance manufacturing operation risk

(audited)

The following table illustrates the effects of selected interest rate, equity price and foreign exchange rate scenarios on our profit for the year and the total shareholders' equity of our insurance operation.

	2021 Impact on profit after tax and shareholders' equity	2020 Impact on profit after tax and shareholders' equity
+ 100 basis points shift in yield curves	(675)	(750)
- 100 basis points shift in yield curves	725	787
10 per cent increase in equity prices	551	442
10 per cent decrease in equity prices	(533)	(468)
10% increase in USD exchange rate compared to all currencies	76	126
10% decrease in USD exchange rate compared to all currencies	(76)	(126)

Where appropriate, the effects of the sensitivity tests on profit after tax and total equity incorporate the impact of the stress on the PVIF. The relationship between the profit and total equity and the risk factors is non-linear and nonsymmetrical, therefore the results disclosed should not be extrapolated to measure sensitivities to different levels of stress. The sensitivities reflect the established risk sharing mechanism with policyholders for participating products, and are stated before allowance for management actions which may mitigate the effect of changes in the market environment. The sensitivities presented do not allow for adverse changes in policyholders' behaviour that may arise in response to changes in market rates.

Credit risk (insurance)

Credit risk is the risk of financial loss if a customer or counterparty fails to meet their obligation under a contract. It arises in two main areas for our insurance manufacturing subsidiary:

- risk associated with credit spread volatility and default by debt security counterparties after investing premiums to generate a return for policyholders and shareholders; and
- risk of default by reinsurance counterparties and non-reimbursement for claims made after ceding insurance risk.

The amounts outstanding at the balance sheet date in respect of these items are mainly reflected as 'Financial investments' and 'Reinsurers' share of liabilities under insurance contracts' in the table of 'Balance sheet of insurance manufacturing subsidiary by type of contract' under 'Insurance manufacturing operation risk' section.

Our insurance manufacturing subsidiary is responsible for the credit risk, quality and performance of their investment portfolios. Our assessment of the creditworthiness of issuers and counterparties is based primarily upon internationally recognised credit ratings and other publicly available information. Investment credit exposures are monitored against limits by our insurance manufacturing subsidiary. Stress testing is performed on the investment credit exposures using credit spread sensitivities and default probabilities is included in the stress and scenario testing as described above.

We use tools to manage and monitor credit risk. These include a credit report which contains a watch-list of investments with current credit concerns to identify investments which may be at risk of future impairment or where high concentrations to counterparties are present in the investment portfolio.

Impairment is calculated in three stages and financial assets are allocated into one of the three stages where the transfer mechanism depends on whether there is a significant increase in credit risk between its initial recognition and the relevant reporting period. After the allocation, the measurement of ECL, which is the product of PD, LGD and EAD, will reflect the risk of default occurring over the remaining life of the instruments. Note 2(j) of the financial statements set out the details on related accounting policy.

(h) Insurance manufacturing operation risk

(audited)

Credit risk (insurance) continued

Credit risk on assets supporting unit-linked liabilities is predominantly borne by the policyholders; therefore our exposure is primarily assets related to liabilities under non-linked insurance and investment contracts and shareholders' funds.

The credit quality of the reinsurers' share of liabilities under insurance contracts is assessed as 'strong' (as defined on 'Credit quality classification' under 'Credit risk' section), with 0% of the exposure being past due nor impaired (2020: 0%). The credit quality of financial assets is included under the Credit Risk section. The risk associated with credit spread volatility is to a large extent migrated by holding debt securities to maturity, and sharing a degree of credit spread experience with policyholders.

Liquidity risk (insurance)

Liquidity risk is the risk that an insurance operation, though solvent, either does not have sufficient financial resources available to meet its obligations when they fall due, or can secure them only at excessive cost.

Risk is managed by cashflow matching and maintaining sufficient cash resources; investing in high-credit-quality investments with deep and liquid markets, monitoring investment concentrations and restricting them where appropriate and establishing committed contingency borrowing facilities.

Our insurance manufacturing subsidiary completes quarterly liquidity risk reports and an annual review of the liquidity risks to which it is exposed.

The following table shows the expected undiscounted cash flows for insurance contract liabilities at 31 December 2021.

Expected maturity of insurance contract liabilities

	Expected cash flows (undiscounted)				
	Within 1 year	Over 1 year but within 5 years	Over 5 years but within 15 years	Over 15 years	Total
2021					
Non-linked insurance	14,958	49,836	82,850	122,856	270,500
Linked insurance	12	41	61	32	146
	14,970	49,877	82,911	122,888	270,646
2020					
Non-linked insurance	15,106	48,599	79,035	109,096	251,836
Linked insurance	11	41	62	32	146
	15,117	48,640	79,097	109,128	251,982

The remaining contractual maturity of investment contract liabilities is included in the table on note 21 of the financial statements.

Insurance risk

Insurance risk is the risk of loss through adverse experience, in either timing or amount, of insurance underwriting parameters (non-economic assumptions). These parameters include mortality, morbidity, longevity, lapses and unit costs. The principal risk we face is that, over time, the cost of the contract, including claims and benefits may exceed the total amount of premiums and investment income received. The table of 'Balance sheet of insurance manufacturing subsidiary by type of contract' under 'Insurance manufacturing operation risk' section analyses our life insurance risk exposures by type of contract under 'liabilities under insurance contracts'.

(h) Insurance manufacturing operation risk

(audited)

Insurance risk continued

The Group's insurance manufacturing subsidiary primarily uses the following techniques to manage and mitigate insurance risk:

- a formalised product approval process covering product design, pricing and overall proposition management (for example, management of lapses by introducing surrender charges);
- underwriting policy;
- claims management processes; and
- reinsurance which cedes risks above our acceptable thresholds to an external reinsurer thereby limiting our exposure.

The following table shows the sensitivity of profit and total equity to reasonably possible changes in non-economic assumptions:

	2021	2020
Effect on profit after tax and total equity at 31 December		
10 per cent increase in mortality and/or morbidity rates	(101)	(100)
10 per cent decrease in mortality and/or morbidity rates	102	99
10 per cent increase in lapse rates	(99)	(92)
10 per cent decrease in lapse rates	107	100
10 per cent increase in expense rates	(58)	(63)
10 per cent decrease in expense rates	57	63

Mortality and morbidity risk is typically associated with life insurance contracts. The effect on profit of an increase in mortality or morbidity depends on the type of business being written.

Sensitivity to lapse rates depends on the type of contracts being written. In general, for life insurance contracts a policy lapse has two offsetting effects on profits, which are the loss of future income on the lapsed policy and the existence of surrender charge recouped at policy lapse. The net impact depends on the relative size of these two effects which varies with the type of contracts.

Expense rate risk is the exposure to a change in the cost of administering insurance contracts. To the extent that increased expenses cannot be passed on to policyholders, an increase in expense rates will have a negative effect on our profits.

Present value of in-force long-term insurance business ('PVIF')

In calculating PVIF, expected cash flows are projected after adjusting for a variety of assumptions made by insurance operation to reflect local market conditions and management's judgement of future trends, and uncertainty in the underlying assumptions is reflected by applying margins (as opposed to a cost of capital methodology). Variations in actual experience and changes to assumptions can contribute to volatility in the results of the insurance business.

Actuarial Control Committee meets on a quarterly basis to review and approve PVIF assumptions. All changes to non-economic assumptions, economic assumptions that are not observable and model methodology must be approved by the Actuarial Control Committee.

Economic assumptions are either set in a way that is consistent with observable market values or, in certain markets is made of long-term economic assumptions. Setting such assumptions involves the projection of long-term interest rates and the time horizon over which observable market rates trend towards these long-term assumptions. The assumptions are informed by relevant historical data and by research and analysis performed by internal and external experts, including regulatory bodies. The valuation of PVIF will be sensitive to any changes in these long-term assumptions in the same way that it is sensitive to observed market movements, and the impact of such changes is included in the sensitivities presented below.

(h) Insurance manufacturing operation risk

(audited)

Present value of in-force long-term insurance business ('PVIF') continued

The Group sets the risk discount rate applied to the PVIF calculation by starting from a risk-free rate curve and adding explicit allowances for risks not reflected in the best estimate cash flow modelling. Where shareholders provide

options and guarantees to policyholders the cost of these options and guarantees is an explicit reduction to PVIF.

Economic assumptions

The following table shows the impact on the PVIF at balance sheet date of reasonably possible changes in the main economic and business assumptions:

	2021	2020
+ 100 basis points shift in yield curves	(806)	(2,891)
– 100 basis points shift in yield curves	902	875

Non-economic assumptions

PVIF are determined by reference to non-economic assumptions, including mortality and/or morbidity, lapse rates and expense rates. The following table illustrates the impact on the PVIF of the changes in key variables:

	2021	2020
10 per cent increase in mortality and/or morbidity rates	(154)	(141)
10 per cent decrease in mortality and/or morbidity rates	261	139
10 per cent increase in lapse rates	(191)	(163)
10 per cent decrease in lapse rates	256	174
10 per cent increase in expense rates	(119)	(116)
10 per cent decrease in expense rates	154	116

The impact on PVIF shown above is illustrative only and employ simplified scenarios. It should be noted that the effects may not be linear and therefore the results cannot be extrapolated. The sensitivities reflect the established risk sharing mechanism with policyholders for participating products, but do not incorporate other actions that could be taken by management to mitigate effects nor do they take into account the consequential changes in policyholders' behaviour.

Process used to determine assumptions for long-term insurance contracts

The process used to determine the assumptions is intended to result in stable and prudent estimates of future outcome. This is achieved by adopting relatively conservative assumptions which can withstand a reasonable range of fluctuation of actual experience. Annual review of the relevant experience is performed to assess the adequacy of margin between the assumptions adopted and the best estimate of future outcome. The assumptions that are considered include expenses and the probability of claims. Discount rate is determined by the risk free rate for both historical and new reinvestment rates.

For non-linked life business, the policy reserve is generally calculated on a modified net premium basis. The net premium is the level of premium payable over the premium payment period whose discounted value at the outset of the policy would be sufficient to exactly cover the discounted value of the original guaranteed benefits at maturity or at death if earlier. The net premium is then modified to allow for deferral of acquisition costs. The policy reserve is then calculated by subtracting the present value of future modified net premiums from the present value of the benefits guaranteed at maturity or death up to the balance sheet date, subject to a floor of the cash value. The modified net premium basis makes no allowance for voluntary discontinuance by policyholders as this would generally result in a reduced level of policy reserve.

For linked life business, the policy reserve is generally determined as the total account balance of all in-force policies with an additional provision for the unexpired insurance risk.

(h) Insurance manufacturing operation risk

(audited)

Assumptions

The principal assumptions underlying the calculation of the policy reserve are:

(i) Mortality

A base mortality table which is most appropriate for each type of contract is selected. An adjustment is included to reflect the Group's own experience with an annual investigation performed to ascertain the appropriateness of overall assumption.

(ii) Morbidity

The morbidity incidence rates, which mainly cover major illness and disability, are generally derived from the reinsurance costs which also form the pricing basis. A loading is generally added as a provision for adverse deviation. An annual investigation is performed to ascertain the appropriateness with the Group's insurance subsidiary's actual experience.

(iii) Discount rates

Rate of interest

	2021	2020
Policies denominated in HKD	2.20%	2.15%
Policies denominated in USD	3.30%	3.40%
Policies denominated in RMB	3.00%	3.20%

Under the modified net premium method, the long-term business provision is sensitive to the interest rate used for discounting.

Sensitivity to changes in variables

The Group's insurance subsidiary re-runs its valuation models on various bases. An analysis of sensitivity around various scenarios provides an insight to the key risks which the Group's insurance subsidiary is exposed to. The table presented below demonstrates the sensitivity of insured liability estimates to particular movements in assumptions used in the estimation process. Certain variables can be expected to impact on life insurance liabilities more than others, and consequently a greater degree of sensitivity to these variables may be expected.

The following table illustrates the impact on the policy reserves of the changes in key variables:

		2021	2020
	Change in variable	Impact on the policy reserves	Impact on the policy reserves
Discount rate	+100 basis points	(5,014)	(6,269)
Discount rate	-100 basis points	14,875	18,541
Mortality/Morbidity	+10 per cent	403	497
Mortality/Morbidity	-10 per cent	(335)	(417)

The analysis above has been prepared for a change in variable with all other assumptions remaining constant and ignores changes in values of the related assets.

For the sensitivity in discount rate, an absolute +/-100 basis points of the discount rate is used. For the Mortality/Morbidity sensitivity, a relative +/-10% (i.e. multiply the assumption by 110% or 90%) is used.