HSBC Holdings plc
Annual Report and Accounts 2022

HSBC | Opening up a world of opportunity

Risk review

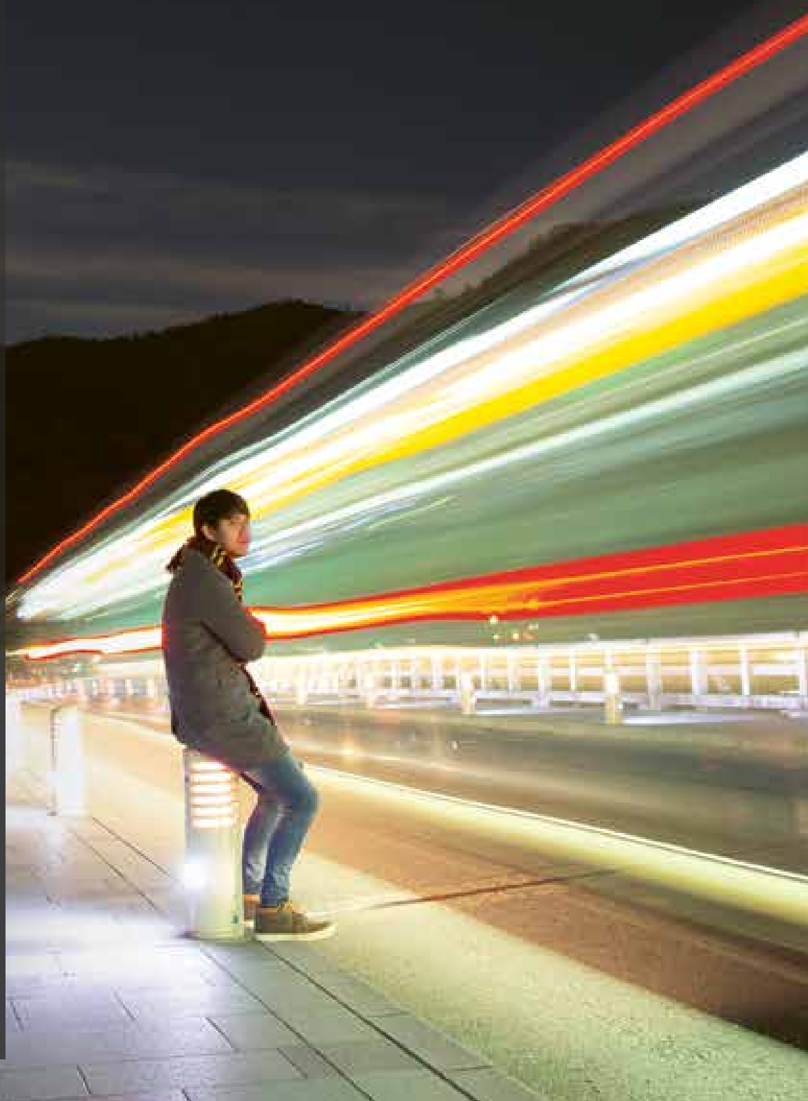
Our risk review outlines our approach to risk management, how we identify and monitor top and emerging risks, and the actions we take to mitigate them. In addition, it explains our material banking risks, including how we manage capital.

Identifying suspicious activities through our award-winning AI tool

We are using the latest artificial intelligence technology to help identify suspicious activities to help prevent financial crime. Our dynamic risk assessment solution brings data together on the Cloud, and uses machine learning to analyse and identify criminal activity by making use of relevant data, with the ability to identify patterns that humans are unlikely to spot.

The tool, which we first developed in November 2021 and is active in several markets including the UK, enables suspicious activity to be identified twice as fast than the previous process and reduces case volumes by 60%.

The solution was recognised at the 2022 Banking Tech Awards, winning 'Best Use of Cloud' and 'Best Use of AI'. We plan to roll it out to other markets throughout 2023.



Our approach to risk

Our risk appetite

We recognise the importance of a strong culture, which refers to our shared attitudes, beliefs, values and standards that shape behaviours including those 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 risks, 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 our risk appetite and strong risk management capability.
- We aim to deliver sustainable and diversified earnings and consistent returns for shareholders.

Business practice

- 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 Group business.
- We are committed to managing the climate risks that have an impact on our financial position, and delivering on our net zero ambition.
- We consider and, where appropriate, mitigate reputational risk that may arise from our business activities and decisions.
- We monitor non-financial risk exposure against risk appetite, including exposure related to inadequate or failed internal processes, people and systems, or events that impact our customers or can lead to sub-optimal returns to shareholders, censure, or reputational damage.

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 the risk to achieving our strategy or objectives as the result of failed internal processes, people and systems, or from external events.

Our risk appetite is expressed in both quantitative and qualitative terms and applied at the global business level, at the regional level and to material operating entities. Every three years, the Group Risk and Compliance function commissions an external independent firm to review the Group's approach to risk appetite and to help ensure that it remains in line with market best practice and regulatory expectations. This review was last carried out in 2021 and confirmed the Group's risk appetite statement ('RAS') remains aligned to best practices, regulatory expectations and strategic goals. Our risk appetite continues to evolve and expand its scope as part of our regular review process.

The Board reviews and approves the Group's risk appetite regularly to make sure it remains fit for purpose. The Group's 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 RAS. 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 is applied to the development of business line strategies, strategic and business planning and remuneration. At a Group level, performance against the RAS is reported to the Group Risk Management Meeting alongside key risk indicators to support targeted insight and discussion on breaches of risk appetite and any associated mitigating actions. This reporting allows risks to be promptly identified and mitigated, and informs risk-adjusted remuneration to drive a strong risk culture.

Each global business, region and material operating entity is required to have its own RAS, which is monitored to help ensure it remains aligned with the Group's RAS. Each RAS and business activity is guided and underpinned by qualitative principles and/or quantitative metrics.

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 described on page 134.

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 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 identifying, assessing, managing and reporting the risks we accept and incur in our activities, with clear accountabilities. We actively review and enhance our risk management framework and 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.

Group Risk and Compliance is independent from the global businesses, including our sales and trading functions, to provide challenge, oversight and appropriate balance in risk/return decisions.

Our risk management framework

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

Key components of our risk management framework

HSBC Values and risk culture		
Risk governance	Non-executive risk governance	The Board approves the Group's risk appetite, plans and performance targets. It sets the 'tone from the top' and is advised by the Group Risk Committee (see page 255).
	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 (see pages 134 and 142).
Roles and responsibilities	Three lines of defence model	Our 'three lines of defence' model defines roles and responsibilities for risk management. An independent Group Risk and Compliance function helps ensure the necessary balance in risk/return decisions (see page 134).
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	Operational and resilience risk management defines minimum standards and processes for managing operational risks and internal controls.
	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.

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

The Group Chief Risk and Compliance Officer is also responsible for the oversight of reputational risk, with the support of the Group Reputational Risk Committee. The Group Reputational Risk Committee considers matters arising from customers, transactions and third parties that either present a serious potential reputational risk to the Group or merit a Group-led decision to ensure a consistent risk management approach across the regions, global businesses and global functions. Further details can be found under the 'Reputational risk' section of www.hsbc.com/our-approach/risk-and-responsibility.

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 our business and functional structures as described in the following commentary, 'Our responsibilities'.

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 Group Risk Management Meeting. This structure is summarised in the following table.

Governance structure for the management of risk and compliance

Authority	Membership	Responsibilities include:
Group Risk Management Meeting	Group Chief Risk and Compliance Officer Group Chief Legal Officer Group Chief Executive Group Chief Financial Officer Group Head of Financial Crime and Group Money Laundering Reporting Officer Group Head of Compliance All other Group Executive Committee members	• Supporting the Group Chief Risk and Compliance Officer in exercising Board-delegated risk management authority • Overseeing the implementation of risk appetite and the risk management framework • Forward-looking assessment of the risk environment, analysing possible risk impacts and taking appropriate action • Monitoring all categories of risk and determining appropriate mitigating action • Promoting a supportive Group culture in relation to risk management and conduct
Group Risk and Compliance Executive Committee	Group Chief Risk and Compliance Officer Chief risk officers of HSBC's global businesses and regions Heads of Global Risk and Compliance sub-functions	• Supporting the Group Chief Risk and Compliance Officer in providing strategic direction for the Group Risk and Compliance function, setting priorities and providing oversight • Overseeing a consistent approach to accountability for, and mitigation of, risk and compliance across the Group
Global business/regional risk management meetings	Global business/regional chief risk officer Global business/regional chief executive officer Global business/regional chief financial officer Global business/regional heads of global functions	• Supporting the Group Chief Risk and Compliance Officer in exercising Board-delegated risk management authority • Forward-looking assessment of the risk environment • Implementation of risk appetite and the risk management framework • Monitoring all categories of risk and overseeing appropriate mitigating actions • Embedding a supportive culture in relation to risk management and controls

The Board committees with responsibility for oversight of risk-related matters are set out on page 258.

Treasury risks are the responsibility of the Group Executive Committee and the Group Risk Committee. Global Treasury actively manages these risks, supported by the Holdings Asset and Liability Management Committee ('ALCO') and local ALCOs, overseen by Treasury Risk Management and the Group Risk Management Meeting. Further details on treasury risk management are set out on page 202.

Our 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 structures as described below.

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.

The 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 challenges the first line of defence on effective risk management, and provides advice and guidance in relation to the risk.
- The third line of defence is our Global Internal Audit function, which provides independent assurance as to whether our risk management approach and processes are designed and operating effectively.

Group Risk and Compliance function

Our Group Risk and Compliance function is responsible for the Group's risk management framework. This responsibility includes establishing global policy, monitoring risk profiles, and identifying and managing forward-looking risk. Group Risk and Compliance is made up of sub-functions covering all risks to our business. Forming part of the second line of defence, the Group Risk and Compliance function is independent from the global 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 our various specialist risk stewards and the collective accountability held by our chief risk officers.

We have continued to strengthen the control environment and our approach to the management of non-financial risk, as set out in our risk management framework. The management of non-financial risk focuses on governance and risk appetite, and provides a single view of the non-financial risks that matter the most as well as the associated controls. It incorporates a risk management system designed to enable the active management of non-financial risk. Our ongoing focus is on simplifying our approach to non-financial risk management, while driving more effective oversight and better end-to-end identification and management of non-financial risks. This is overseen by the Operational and Resilience Risk function, headed by the Group Head of Operational and Resilience Risk.

Stress testing and recovery planning

We operate a wide-ranging stress testing programme that is a key part of our risk management and capital and liquidity 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 and liquidity 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.

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 HSBC.

The selection of stress scenarios is based upon the output of our identified top and emerging risks 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, be absorbed through capital and liquidity. This in turn informs decisions about preferred capital and liquidity levels and allocations.

In addition to the Group-wide stress testing scenarios, each major subsidiary conducts regular macroeconomic and event-driven scenario analysis specific to its region. They also participate, as required, in the regulatory stress testing programmes of the jurisdictions in which they operate, such as stress tests required by the Bank of England ('BoE') in the UK, the Federal Reserve Board ('FRB') in the US, and the Hong Kong Monetary Authority ('HKMA') in Hong Kong. Global functions and businesses also perform bespoke stress testing to inform their assessment of risks to potential scenarios.

We also conduct reverse stress tests each year at 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 part of the integral framework safeguarding the Group's financial stability. The Group recovery plan, together with stress testing, help us understand the likely outcomes of adverse business or economic conditions and in the identification of appropriate risk mitigating actions. The Group is committed to further developing its recovery and resolution capabilities in line with the BoE's Resolvability Assessment Framework requirements.

Key developments in 2022

We actively managed the risks related to macroeconomic uncertainties including inflation, fiscal and monetary policy, the Russia-Ukraine war, broader geopolitical uncertainties and continued risks resulting from the Covid-19 pandemic, as well as other key risks described in this section. In addition, we sought to enhance our risk management in the following areas:

- We continued to improve our risk governance decision making, particularly with regard to the governance of treasury risk, to help ensure senior executives have appropriate oversight and visibility of macroeconomic trends around inflation and interest rates.
- We adapted our interest rate risk management strategy as market and official interest rates increased in reaction to inflationary pressures. This included the Board approving in September a new interest rate risk in the banking book strategy, a managed reduction in the duration risk of our hold-to-collect-and-sell asset portfolio and an increase in net interest income stabilisation.
- We began a process of enhancement of our country credit risk management framework to strengthen our control of risk tolerance and appetite at a country level.
- We continued to develop our approach to emerging risk identification and management, including the use of forward-looking indicators to support our analysis.
- We enhanced our enterprise risk reporting processes to place a greater focus on our emerging risks, including by capturing the materiality, oversight and individual monitoring of these risks.
- We sought to further strengthen our third-party risk policy and processes to improve control and oversight of our material third parties to maintain our operational resilience, and to meet new and evolving regulatory requirements.
- We made progress with our comprehensive regulatory reporting programme to strengthen our global processes, improve consistency and enhance controls.
- We continued to embed the governance and oversight around model adjustments and related processes for IFRS 9 models and Sarbanes-Oxley controls.
- We commenced a programme to enhance our framework for managing the risks associated with machine learning and artificial intelligence ('AI').
- Through our climate risk programme, we continued to embed climate considerations throughout the organisation, including updating the scope of our programme to cover all risk types, expanding the scope of climate-related training, developing new climate risk metrics to monitor and manage exposures, and developing our internal climate scenario exercise.
- We sought to improve the effectiveness of our financial crime controls, deploying advanced analytics capabilities into new markets. We refreshed our financial crime policies to help ensure they remain up to date and address changing and emerging risks. We continue to monitor regulatory changes.

Top and emerging risks

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 regions and global businesses, for any risks that may require global escalation. We update our top and emerging risks as necessary.

Our current top and emerging risks are as follows.

Externally driven

Geopolitical and macroeconomic risks

The Russia-Ukraine war has had far-reaching geopolitical and economic implications. HSBC is monitoring the impacts of the war and continues to respond to the further economic sanctions and trade restrictions that have been imposed on Russia in response. In particular, significant sanctions and trade restrictions imposed against Russia have been put in place by the UK, the US and the EU, as well as other countries. Such sanctions and restrictions have specifically targeted certain Russian government officials, politically exposed persons, business people, Russian oil imports, energy products, financial institutions and other major Russian companies. In addition, there have been put in place more generally applicable investment, export, and import bans and restrictions. In response to such sanctions and trade restrictions, as well as asset flight, Russia has implemented certain countermeasures.

Further sanctions, trade restrictions and Russian countermeasures may adversely impact the Group, its customers and the markets in which the Group operates by creating regulatory, reputational and market risks. Our business in Russia principally serves multinational corporate clients headquartered in other countries, is not accepting new business or customers and is consequently on a declining trend. Following a strategic review, HSBC Europe BV (a wholly-owned subsidiary of HSBC Bank plc) has entered into an agreement to sell its wholly-owned subsidiary HSBC Bank (RR) (Limited Liability Company), subject to regulatory and governmental approvals.

Global commodity markets have been significantly impacted by the Russia-Ukraine war and localised Covid-19 outbreaks, leading to continued supply chain disruptions. This has resulted in product shortages appearing across several regions, and increased prices for both energy and non-energy commodities, such as food. We do not expect these to ease significantly in the near term. In turn, this has had a significant impact on global inflation. Relatively mild weather, until recently, and diversification of fuel sources have nevertheless helped regions most dependent on Russian supply to substantially reduce risks of rationing over the winter months.

China's policy measures issued at the end of 2022 have increased liquidity and the supply of credit to the mainland China commercial real estate sector. Recovery in the underlying domestic residential demand and improved customer sentiment will be necessary to support the ongoing health of the sector. We will continue to monitor the sector closely, notably the risk of further idiosyncratic real estate defaults and the potential associated impact on wider market, investor and consumer sentiment. Given that parts of the global economy are in, or close to, recession, the demand for Chinese exports may also diminish.

Rising global inflation has prompted central banks to tighten monetary policy. Since the beginning of 2022, the US Federal Reserve Board ('FRB') has delivered a cumulative 450 basis point ('bps') increase in the Federal Funds rate. The European Central Bank lagged the FRB initially, but its benchmark rate has subsequently been increased by 300bps since July 2022. As of mid-February 2023, interest-rate futures suggested market uncertainty as to whether the FRB would begin to ease monetary policy over the 12-month horizon. Should monetary policy rates move materially higher than current expectations, a realignment of market expectations could cause turbulence in financial asset prices.

Financial markets have also shown reduced appetite for expansionary fiscal policies in the context of high debt ratios. Following the fiscal statement of 23 September 2022 by the UK government, there was a fall in the value of sterling and a sharp rise in the yields of UK government securities, known as gilts. Following this, the Bank of England reversed its plan to begin selling its gilt holdings from September 2022, and the UK government reversed most of the previously announced fiscal measures. We continue to monitor our risk profile closely in the context of uncertainty over global macroeconomic policies.

Higher inflation and interest rate expectations around the world – and the resulting economic uncertainty – have had an impact on expected credit losses and other credit impairment charges ('ECL'). The combined pressure of higher inflation and interest rates may impact the ability of our customers to repay debt. Our Central scenario, which has the highest probability weighting in our IFRS 9 'Financial Instruments' calculations of ECL, assumes low growth and a higher inflation environment across many of our key markets. However, due to the rapidly changing economic conditions, the potential for forecast dispersion and volatility remain high, impacting the degree of accuracy and certainty of our Central scenario forecast. The level of volatility varies by market, depending on exposure to commodity price increases, supply chain constraints, the monetary policy response to inflation and the public health policy response to the Covid-19 pandemic. As a result, our Central scenario for impairment has not been assigned the same likelihood of occurrence across our key markets. There is also uncertainty with respect to the relationship between the economic drivers and the historical loss experience, which has required adjustments to modelled ECL in cases where we determined that the model was unable to capture the material underlying risks.

For further details of our Central and other scenarios, see 'Measurement uncertainty and sensitivity analysis of ECL estimates' on page 153.

Global tensions over trade, technology and ideology are manifesting themselves in divergent regulatory standards and compliance regimes, presenting long-term strategic challenges for multinational businesses.

The US-China relationship remains complex. To date, the UK, the US, the EU and other countries have imposed various sanctions and trade restrictions on Chinese persons and companies. Although sanctions and trade restrictions are difficult to predict, increases in diplomatic tensions between China and the US and other countries could result in sanctions that could negatively impact the Group, its customers and the markets in which the Group operates. There is a continued risk of additional sanctions and trade restrictions being imposed by the US and other governments in relation to human rights, technology, and other issues with China, and this could create a more complex operating environment for the Group and its customers.

China has in turn announced a number of its own sanctions and trade restrictions that target, or provide authority to target, foreign individuals and companies.

These and any future measures and countermeasures that may be taken by the US, China and other countries may affect the Group, its customers and the markets in which the Group operates.

Negotiations between the UK and the EU over the operation of the Northern Ireland Protocol are continuing. While there are signs that differences may be diminishing, failure to reach agreement could have implications for the future operation of the EU-UK Trade and Cooperation Agreement.

In June 2022, the UK government published proposed legislation that seeks to amend the Protocol in a number of respects. In response, the EU launched infringement procedures against the UK, and is evaluating the UK response, received in September 2022. If the proposed legislation were to pass, and infringement procedures progressed, it could further complicate the terms of trade between the UK and the EU and potentially prevent progress in other areas such as financial services. Over the medium to long term, the UK's withdrawal from the EU may impact markets and increase economic risk, particularly in the UK, which could adversely impact our profitability and prospects for growth in this market. We are monitoring the situation closely, including the potential impacts on our customers.

In August 2022, the US Inflation Reduction Act introduced a minimum tax of 15% with effect from 1 January 2023. It is possible that the minimum tax could result in an additional US tax liability over our regular US federal corporate tax liability in a given year, based on the differences between US book and taxable income (including as a result of temporary differences). Given its recent pronouncement, it is unclear at this time what, if any, impact the US Inflation Reduction Act will have on HSBC's US tax rate and US financial results. HSBC will continue to evaluate its impact as further information becomes available. In addition, potential changes to tax legislation and tax rates in the countries and territories in which we operate could increase our effective tax rate in the future.

As the geopolitical landscape evolves, compliance by multinational corporations with their legal or regulatory obligations in one jurisdiction may be seen as supporting the law or policy objectives of that jurisdiction over another, creating additional compliance, reputational and political risks for the Group. We maintain dialogue with our regulators in various jurisdictions on the impact of legal and regulatory obligations on our business and customers.

The financial impact on the Group of geopolitical risks in Asia is heightened due to the region's relatively high contribution to the Group's profitability, particularly in Hong Kong.

While it is the Group's policy to comply with all applicable laws and regulations of all jurisdictions in which it operates, geopolitical risks and tensions, and potential ambiguities in the Group's compliance obligations, will continue to present challenges and risks for the Group and could have a material adverse impact on the Group's business, financial condition, results of operations, prospects and strategy, as well as on the Group's customers.

Expanding data privacy, national security and cybersecurity laws in a number of markets could pose potential challenges to intra-group data sharing. These developments could increase financial institutions' compliance obligations in respect of cross-border transfers of personal information, which may affect our ability to manage financial crime risks across markets.

Mitigating actions

- We closely monitor geopolitical and economic developments in key markets and sectors and undertake scenario analysis where appropriate. This helps us to take portfolio actions where necessary, including through enhanced monitoring, amending our risk appetite and/or reducing limits and exposures.

- We stress test portfolios of particular concern to identify sensitivity to loss under a range of scenarios, with management actions being taken to rebalance exposures and manage risk appetite where necessary.
- We regularly review key portfolios to help ensure that individual customer or portfolio risks are understood and that our ability to manage the level of facilities offered through any downturn is appropriate.
- We continue to manage sanctions and trade restrictions through the use of, and enhancements to, our existing controls.
- We continue to monitor the UK's relationship with the EU, and assess the potential impact on our people, operations and portfolios.
- We have taken steps, where necessary, to enhance physical security in geographical areas deemed to be at high risk from terrorism and military conflicts.

Technology and cybersecurity risk

Together with other organisations, we operate in an extensive and complex technology landscape, which needs to remain resilient in order to support customers, our organisation and financial markets globally. Risks arise where technology is not understood, maintained, or developed appropriately. We also continue to operate in an increasingly hostile cyber threat environment globally. These threats include potential unauthorised access to customer accounts, attacks on our systems or those of our third-party suppliers, and require ongoing investment in business and technical controls to defend against.

Mitigating actions

- We continue to invest in transforming how software solutions are developed, delivered and maintained to improve system resilience. We continue to build security into our software development lifecycle and improve our testing processes and tools.
- We continue to upgrade many of our IT systems, simplify our service provision and replace older IT infrastructure and applications. These enhancements supported global improvements in service availability during 2022 for both our customers and colleagues.
- We continually evaluate threat levels for the most prevalent cyber-attack types and their potential outcomes. To further protect HSBC and our customers and help ensure the safe expansion of our global businesses, we continue to strengthen our controls to reduce the likelihood and impact of advanced malware, data leakage, exposure through third parties and security vulnerabilities.
- We continue to enhance our cybersecurity capabilities, including Cloud security, identity and access management, metrics and data analytics, and third-party security reviews. An important part of our defence strategy is ensuring our colleagues remain aware of cybersecurity issues and know how to report incidents.
- We report and review cyber risk and control effectiveness at executive and non-executive Board level. We also report it across our global businesses, functions and regions to help ensure there is appropriate visibility and governance of the risk and its mitigating actions.
- We participate globally in industry bodies and working groups to collaborate on tactics employed by cyber-crime groups and to work together preventing, detecting and defending against cyber-attacks on financial organisations globally.

Evolving regulatory environment risk

We aim to keep abreast of the emerging regulatory compliance and conduct agenda, which currently includes, but is not limited to: ESG matters; ensuring good customer outcomes; addressing customer vulnerabilities due to cost of living pressures; regulatory compliance; regulatory reporting; employee compliance, including the use of e-communication channels; and the proposed reforms to the UK financial services sector, known as the Edinburgh Reforms. We monitor regulatory developments closely and engage with regulators, as appropriate, to help ensure new regulatory requirements are implemented effectively and in a timely way. The competitive landscape in which the Group operates may be impacted by future regulatory changes and government intervention.

Mitigating actions

- We monitor for regulatory developments to understand the evolving regulatory landscape and seek to respond with changes in a timely manner.
- We engage with governments and regulators, responding to consultations with a view to help shaping regulations that can be implemented effectively. We hold regular meetings with relevant authorities to discuss strategic contingency plans, including those arising from geopolitical issues.
- Our simplified conduct approach aligns to our purpose and values, in particular the value 'we take responsibility'.

Financial crime risk

Financial institutions remain under considerable regulatory scrutiny regarding their ability to detect and prevent financial crime. These evolving challenges include managing conflicting laws and approaches to legal and regulatory regimes, and implementing an unprecedented volume and diverse set of sanctions, notably as a result of the Russia-Ukraine war.

Amid rising inflation and increasing cost of living pressures, we face increasing regulatory expectations with respect to managing internal and external fraud, and protecting vulnerable customers.

The digitisation of financial services continues to have an impact on the payments ecosystem, with an increasing number of new market entrants and payment mechanisms, not all of which are subject to the same level of regulatory scrutiny or regulations as banks. Developments around digital assets and currencies have continued at pace, with an increasing regulatory and enforcement focus on the financial crimes linked to these types of assets.

Expectations with respect to the intersection of ESG issues and financial crime, as our organisation, customers and suppliers transition to net zero, continue to increase. These are particularly focused on potential 'greenwashing', human rights issues and environmental crimes. In addition, climate change itself could heighten risks linked to vulnerable migrant populations in countries where financial crime is already more prevalent.

We also continue to face increasing challenges presented by national data privacy requirements, which may affect our ability to manage financial crime risks across markets.

Mitigating actions

- We continue to manage sanctions and trade restrictions through the use of, and enhancements to, our existing controls.
- We continue to develop our fraud controls and invest in 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, as well as risks associated with direct and indirect exposure to digital assets and currencies, in an effort to maintain appropriate financial crime controls.
- We are assessing our existing policies and control framework so that developments relating to ESG are considered and the risks mitigated.
- We engage with regulators, policymakers and relevant international bodies, seeking to address data privacy challenges through international standards, guidance and legislation.

Ibor transition risk

Interbank offered rates ('Ibors') have previously 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 to products linked to near risk-free replacement rates ('RFRs') or alternative reference rates.

The publication of sterling, Swiss franc, euro and Japanese yen Libor interest rate benchmarks, as well as Euro Overnight Index Average ('Eonia'), ceased from the end of 2021. Our Ibor transition programme – which is tasked with the development of RFR products and the transition of legacy Ibor products – has continued to support the transition of a limited number of remaining contracts in sterling and Japanese yen Libor, which were published using a 'synthetic' interest rate methodology during 2022. The remaining 'tough legacy' sterling contracts have required protracted client discussions where contracts are complex or restructuring of facilities is required. The publication of 'synthetic' Japanese yen Libor ceased after 31 December 2022. In addition the FCA announced, in September and November 2022, that one month and six-month 'synthetic' sterling Libor rates will cease to be published from 31 March 2023, and three-month 'synthetic' sterling Libor will cease to be published after 31 March 2024. We have or are prepared to transition or remediate the remaining few contracts relying on 'synthetic' sterling settings, outstanding as at 31 December 2022, in advance of those cessation dates.

For the cessation of the publication of US dollar Libor from 30 June 2023, we have implemented the majority of required processes, technology and RFR product capabilities throughout the Group in preparation for upcoming market events. We will continue to transition outstanding legacy contracts through the first half of 2023. We have completed the transition of the majority of our uncommitted lending facilities, and continue to make steady progress with the transition of the outstanding legacy committed lending facilities. Transition of our derivatives portfolio is progressing well with most clients reliant on industry mechanisms to transition to RFRs. For the limited number of bilateral derivatives trades where an alternative transition path is required, client engagement is continuing. For certain products and contracts, including bonds and syndicated loans, we remain reliant on the continued support of agents and third parties, but we continue to progress those contracts requiring transition. We continue to monitor contracts that may be potentially more challenging to transition, and may need to rely upon legislative solutions. Additionally, following the FCA's consultation in November 2022 proposing that US dollar Libor is to be published using a 'synthetic' methodology for a defined period, we will continue to work with our clients to support them through the transition of their products if transition is not completed by 30 June 2023.

For the Group's own debt securities issuances, we continue to have instruments in US dollars, sterling, Japanese yen and Singapore dollars where the terms provide for an Ibor benchmark to be used to reset the coupon rate if HSBC chooses not to redeem them on their call dates. We remain mindful of the various factors that have an impact on the Ibor remediation strategy for our regulatory capital and MREL instruments, including – but not limited to – timescales for cessation of relevant Ibor rates, constraints relating to the governing law of outstanding instruments, the potential relevance of legislative solutions and industry best practice guidance. We remain committed to seeking to remediate or mitigate relevant risks relating to Ibor-demise, as appropriate, on our outstanding regulatory capital and MREL instruments before the relevant calculation dates, which may occur post-cessation of the relevant Ibor rate or rates.

For US dollar Libor and other demising Ibors, we continue to be exposed to, and actively monitor, risks including:

- regulatory compliance and conduct risks, as the transition of legacy contracts to RFRs or alternative rates, or sales of products referencing RFRs, may not deliver fair client outcomes;
- resilience and operational risks, as changes to manual and automated processes, made in support of new RFR methodologies, and the transition of large volumes of Ibor contracts may lead to operational issues;
- legal risk, as issues arising from the use of legislative solutions and from legacy contracts that the Group is unable to transition may result in unintended or unfavourable outcomes for clients and market participants, which could potentially increase the risk of disputes;
- model risk, as there is a risk that changes to our models to replace Ibor-related data adversely affect the accuracy of model outputs; and
- market risk, because as a result of differences in Libor and RFR interest rates, we are exposed to basis risk resulting from the asymmetric adoption of rates across assets, liabilities and products. Additionally the current stage of the Term Secured Overnight Financing Rate ('SOFR') market presents challenges for certain hedge accounting strategies.

While the level of risk is diminishing in line with our process implementation and continued transition of contracts, we will monitor these risks through the remainder of the transition of legacy contracts. Throughout 2023, we plan to continue to engage with our clients and investors to complete an orderly transition of contracts that reference the remaining demising Ibors.

Mitigating actions

- Our global Ibor transition programme, which is overseen by the Group Chief Risk and Compliance Officer, will continue to deliver IT and operational processes to meet its objectives.
- We carry out extensive training, communication and client engagement to facilitate appropriate selection of new rates and products.
- We have dedicated teams in place to support the transition.
- We have actively transitioned legacy contracts and ceased entering into new contracts based on demised or demising Ibors, other than those allowed under regulatory exemptions, and implemented associated monitoring and controls.
- We assess, 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)

Interest Rate Benchmark Reform Phase 2, the amendments to IFRSs issued in August 2020, represents the second phase of the IASB's project on the effects of interest rate benchmark reform. The amendments address issues affecting financial statements when changes are made to contractual cash flows and hedging relationships.

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.

At 31 Dec 2022	Financial instruments yet to transition to alternative benchmarks, by main benchmark			
	USD Libor $m	**GBP Libor $m**	**JPY Libor $m**	**Others[1] $m**
Non-derivative financial assets				
Loans and advances to customers	**49,632**	**262**	**—**	**7,912**
Other financial assets	**4,716**	**42**	**—**	**1,562**
Total non-derivative financial assets[2]	**54,348**	**304**	**—**	**9,474**
Non-derivative financial liabilities				
Financial liabilities designated at fair value	**17,224**	**1,804**	**1,179**	**—**
Debt securities in issue	**5,352**	**—**	**—**	**—**
Other financial liabilities	**2,988**	**—**	**—**	**176**
Total non-derivative financial liabilities	**25,564**	**1,804**	**1,179**	**176**
Derivative notional contract amount				
Foreign exchange	**140,223**	**—**	**—**	**7,337**
Interest rate	**2,208,189**	**68**	**—**	**186,952**
Total derivative notional contract amount	**2,348,412**	**68**	**—**	**194,289**

At 31 Dec 2021	Financial instruments yet to transition to alternative benchmarks, by main benchmark			
	USD Libor $m	GBP Libor $m	JPY Libor $m	Others[1] $m
Non-derivative financial assets				
Loans and advances to customers	70,932	18,307	370	8,259
Other financial assets	5,131	1,098	—	2
Total non-derivative financial assets[2]	76,063	19,405	370	8,261
Non-derivative financial liabilities				
Financial liabilities designated at fair value	20,219	4,019	1,399	1
Debt securities in issue	5,255	—	—	—
Other financial liabilities	2,998	78	—	—
Total non-derivative financial liabilities	28,472	4,097	1,399	1
Derivative notional contract amount				
Foreign exchange	137,188	5,157	31,470	9,652
Interest rate	2,318,613	284,898	72,229	133,667
Total derivative notional contract amount	2,455,801	290,055	103,699	143,319

1 *Comprises financial instruments referencing other significant benchmark rates yet to transition to alternative benchmarks (euro Libor, Swiss franc Libor, Eonia, SOR, THBFIX, MIFOR and Sibor). Announcements were made by regulators during 2022 on the cessation of the Canadian dollar offered rate ('CDOR') and Mexican Interbank equilibrium interest rate ('TIIE'), which will eventually transition to the Canadian overnight repo rate average ('CORRA') and a new Mexican overnight fall-back rate, respectively. Therefore, CDOR and TIIE are also included in Others during the current period.*
2 *Gross carrying amount excluding allowances for expected credit losses.*

The amounts in the above table relate to HSBC's main operating entities where HSBC has material exposures impacted by Ibor reform, including in the UK, Hong Kong, France, the US, Mexico, Canada, Singapore, the UAE, Bermuda, Australia, Qatar, Germany, Thailand, India and Japan. The amounts provide an indication of the extent of the Group's exposure to the Ibor benchmarks that 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 HSBC's consolidated balance sheet.

Environmental, social and governance ('ESG') risk

We are subject to financial and non-financial risks associated with ESG-related matters. Our current areas of focus include climate risk, nature-related risks and human rights risks. These can impact us both directly and indirectly through our business activities and relationships. For details of how we govern ESG, see page 86.

Our assessment of climate risks covers three distinct time periods, comprising: short term, which is up to 2025; medium term, which is between 2026 and 2035; and long term, which is between 2036 and 2050. Focus on climate-related risk continued to increase over 2022, owing to the pace and volume of policy and regulatory changes globally, particularly on climate risk management, stress testing and scenario analysis and disclosures. If we fail to meet evolving regulatory expectations or requirements on climate risk management, this could have regulatory compliance and reputational impacts.

We could face direct impacts, owing to the increase in frequency and severity of weather events and chronic shifts in weather patterns, which could affect our ability to conduct our day-to-day operations.

Our customers may find that their business models fail to align to a net zero economy or face disruption to their operations or deterioration to their assets as a result of extreme weather.

We face increased reputational, legal and regulatory risk as we make progress towards our net zero ambition, with stakeholders likely to place greater focus on our actions such as the development of climate-related policies, our disclosures and financing and investment decisions relating to our ambition.

We will face additional risks if we are perceived to mislead stakeholders in respect of our climate strategy, the climate impact of a product or service, or the commitments of our customers. Climate risk may also impact on model risk, as the uncertain impacts of climate change and data and methodology limitations present challenges to creating reliable and accurate model outputs.

We also face reporting risk in relation to our climate disclosures, as any data, methodologies and standards we have used may evolve over time in line with market practice, regulation or owing to developments in climate science. While emissions reporting has improved over time, data remains of limited quality and consistency. The use of inconsistent or incomplete data and models could result in sub-optimal decision making. Any changes could result in revisions to our internal frameworks and reported data, and could mean that reported figures are not reconcilable or comparable year on year. We may also have to re-evaluate our progress towards our climate-related targets in future and this could result in reputational, legal and regulatory risks.

There is increasing evidence that a number of nature-related risks beyond climate change, which include risks that can be represented more broadly by impact and dependence on nature, can and will have significant economic impact. These risks arise when the provision of natural services – such as water availability, air quality and soil quality – is compromised by overpopulation, urban development, natural habitat and ecosystem loss, ecosystem degradation arising from economic activity and other environmental stresses beyond climate change. They can show themselves in various ways, including through macroeconomic, market, credit, reputational, legal and regulatory risks, for both HSBC and our customers. We continue to engage with investors, regulators and customers on nature-related risks to evolve our approach and understand best practice risk mitigation.

Regulation and disclosure requirements in relation to human rights, and to modern slavery in particular, are increasing. Businesses are expected to be transparent about their efforts to identify and respond to the risk of negative human rights impacts arising from their business activities and relationships.

Mitigating actions

- We aim to deepen our understanding of the drivers of climate risk. A dedicated Climate Risk Oversight Forum is responsible for shaping and overseeing our approach and providing support in managing climate risk. For further details of the Group's ESG governance structure, see page 86.
- Our climate risk programme continues to support the development of our climate risk management capabilities across four key pillars: governance and risk appetite, risk management, stress testing and scenario analysis, and disclosures. We also aim to enhance our approach to greenwashing risk management.
- In December 2022, we published our updated policy covering the broader energy system including upstream oil and gas, oil and gas power generation, coal, hydrogen, renewables and hydropower, nuclear, biomass and energy from waste. We also expanded our thermal coal phase-out policy, in which we committed to not provide new finance or advisory services for the specific purposes of the conversion of existing coal-to-gas fired power plants, or new metallurgical coal mines (see page 65).
- Climate stress tests and scenarios are being used to further improve our understanding of our risk exposures for use in risk management and business decision making.
- In 2022, we reviewed our salient human rights issues following the methodology set out in the UNGPs. These are the human rights at risk of the most severe potential negative impact through our business activities and relationships. This review built on an earlier review that had identified modern slavery and discrimination as priority human rights issues. For further details, see page 87 of the ESG review.
- In 2021, we joined several industry working groups dedicated to helping us assess and manage nature-related risks, such as the Taskforce on Nature-related Financial Disclosures ('TNFD'). In 2022 our asset management business published its biodiversity policy to publicly explain how our analysts address nature-related issues.
- We continue to engage with our customers, investors and regulators proactively on the management of ESG risks. We also engage with initiatives, including the Climate Financial Risk Forum, Equator Principles, Task Force on Climate-related Financial Disclosures and CDP (formerly the Carbon Disclosure Project) to help drive best practice for climate risk management.

For further details of our approach to climate risk management, see 'Climate risk' on page 221.

For further details of ESG risk management, see 'Financial crime risk' on page 231 and 'Regulatory compliance risk environment including conduct' on page 225.

Our ESG review can be found on page 44.

Digitalisation and technological advances risk

Developments in technology and changes to regulations are enabling new entrants to the industry, particularly with respect to payments. This challenges us to continue innovating and taking advantage of new digital capabilities so that we improve how we serve our customers, drive efficiency and adapt our products to attract and retain customers. As a result, we may need to increase our investment in our business to adapt or develop products and services to respond to our customers' evolving needs. We also need to ensure that new digital capabilities do not weaken our resilience or wider risk management capabilities.

New technologies such as blockchain and quantum computing offer both business opportunities and potential risks for HSBC. As with all use of technologies, we aim to maximise their potential while seeking to ensure a robust control environment is in place to help manage the inherent risks, such as the impact on encryption algorithms.

Mitigating actions:

- We continue to monitor this emerging risk, as well as the advances in technology, and changes in customer behaviours to understand how these may impact our business.
- We assess new technologies to help develop appropriate controls and maintain resilience.
- We closely monitor and assess financial crime risk and the impact on payment transparency and architecture.

Internally driven

Risks associated with workforce capability, capacity and environmental factors with potential impact on growth

Our global businesses and functions in all of our markets are exposed to risks associated with workforce capacity challenges, including challenges to retain, develop and attract high-performing employees in key labour markets, and compliance with employment laws and regulations. Changed working arrangements, and the residual impact of local Covid-19-related restrictions and health concerns during the pandemic, have also affected employee mental health and well-being.

Mitigating actions

- We seek to promote a diverse and inclusive workforce and provide health and well-being support. We continue to build our speak-up culture through active campaigns.
- We monitor hiring activities and levels of employee attrition, with each business and function putting in place plans to help ensure they have effective workforce forecasting to meet business demands.
- We monitor people risks that could arise due to organisational restructuring, helping to ensure we manage redundancies sensitively and support impacted employees. We encourage our people leaders to focus on talent retention at all levels, with an empathetic mindset and approach, while ensuring the whole proposition of working at HSBC is well understood.
- Our Future Skills curriculum helps provides skills that will help to enable employees and HSBC to be successful in the future.
- We develop succession plans for key management roles, with oversight from the Group Executive Committee.

Risks arising from the receipt of services from third parties

We use third parties to provide a range of goods and services. Risks arising from the use of third-party providers and their supply chain may be harder to identify. It is critical that we ensure we have appropriate risk management policies, processes and practices over the selection, governance and oversight of third parties and their supply chain, particularly for key activities that could affect our operational resilience. Any deficiency in the management of risks associated with our third parties could affect our ability to support our customers and meet regulatory expectations.

Mitigating actions

- We continue to monitor the effectiveness of the controls operated by our third-party providers and request third-party control reports, where required. We have made further enhancements to our framework to help ensure risks associated with these arrangements are understood and managed effectively by our global businesses, global functions and regions.
- We continue to enhance the effective management of our intra-Group arrangements using the same control standards as we have for external third-party arrangements.
- We are implementing the changes required by new regulations as set by our regulators.

Model risk

Model risk arises whenever business decision making includes reliance on models. We use models in both financial and non-financial contexts, as well as in a range of business applications such as customer selection, product pricing, financial crime transaction monitoring, creditworthiness evaluation and financial reporting. Assessing model performance is a continuous undertaking. Models can need redevelopment as market conditions change. Significant increases in global inflation and interest rates have impacted the reliability and accuracy of both credit and market risk models.

We continued to prioritise the redevelopment of internal ratings-based ('IRB') and internal model methods ('IMM') models, in relation to counterparty credit, as part of the IRB repair and Basel III programmes with a key focus on enhancing the quality of data used as model inputs. A number of these models have been submitted to the UK's Prudential Regulation Authority ('PRA') and other key regulators for feedback, and approval is in progress. Some IMM and internal model approach ('IMA') models have been approved for use, and feedback has been received for some IRB models. Climate risk modelling is a key focus for the Group as HSBC's commitment to ESG has become a key part of the Group's strategy.

Model risk remains a key area of focus given the regulatory scrutiny in this area, with local regulatory exams taking place in many jurisdictions and further developments in policy expected from many regulators, including the PRA.

Mitigating actions

- We have continued to embed the enhanced monitoring, review and challenge of expected credit loss model performance through our Model Risk Management function as part of a broader quarterly process to determine loss levels. The Model Risk Management team aims to provide effective review and challenge of any future redevelopment of these models.
- Model Risk Governance committees at the Group, business and functional levels continue to provide oversight of model risk.
- Model Risk Management works closely with businesses to ensure that IRB/IMM/IMA models in development meet risk management, pricing and capital management needs. Global Internal Audit provides assurance over the risk management framework for models.
- Additional assurance work is performed by the model risk governance teams, which act as second lines of defence. The teams test whether controls implemented by model users comply with model risk policy and if model risk standards are adequate.
- Models using advanced machine learning techniques are validated and monitored to help ensure that risks that are determined by the algorithms have adequate oversight and review. A framework to manage the range of risks that are generated by these advanced techniques, and to recognise the multidisciplinary nature of these risks, is being developed.

Data risk

We use multiple systems and growing quantities of data to support our customers. Risk arises if data is incorrect, unavailable, misused, or unprotected. Along with other banks and financial institutions, we need to meet external regulatory obligations and laws that cover data, such as the Basel Committee on Banking Supervision's 239 guidelines and the General Data Protection Regulation ('GDPR').

Mitigating actions

- Through our global data management framework, we monitor the quality, availability and security of data that supports our customers and internal processes. We work towards resolving any identified data issues in a timely manner.
- We have made improvements to our data policies. We are implementing an updated control framework (which includes trusted sources, data flows and data quality) in order to enhance the end-to-end management of data risk.
- We have established a global data management utility, and continue to simplify and unify data management activities across the Group.
- We seek to protect customer data through our data privacy framework, which establishes practices, design principles and guidelines that enable us to demonstrate compliance with data privacy laws and regulations.
- We continue to modernise our data and analytics infrastructure through investments in Cloud technology, data visualisation, machine learning and artificial intelligence.
- We continue to educate our employees on data risk and data management. We have delivered regular mandatory training globally on how to protect and manage data appropriately.

Change execution risk

We have continued investment in strategic change to support the delivery of our strategic priorities and regulatory commitments. This requires change to be executed safely and efficiently.

Mitigating actions

- In 2022, we added change execution risk to our risk taxonomy and control library, so that it could be defined, assessed, managed, reported and overseen in the same way as our other material risks.
- The Transformation Oversight Executive Committee oversees the prioritisation, strategic alignment and management of execution risk for all change portfolios and initiatives.

Areas of special interest

During 2022, 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. While considered under the themes captured under top and emerging risks, in this section we have placed a particular focus on the Covid-19 pandemic.

Risks related to Covid-19

The impact from the Covid-19 pandemic remains a continuing risk to our customers and organisation. However, the appetite for public health restrictions has reduced following the successful roll-out of vaccine programmes, and as societies have adapted. Countries continue to differ in their approach, although China has recently reversed restrictions on activity and mobility.

In most countries, high vaccination rates and acquired population immunity have minimised the public health risks and the need for restrictions. However, in mainland China and Hong Kong, adherence to public health restrictions had adverse economic implications throughout much of 2022. Government-imposed restrictions on activity in major Chinese cities, and restrictions on travel, adversely affected global tourism and supply chains.

While the recovery in China resulting from the relaxation of Covid-19 related restrictions on movement, international travel and tourism in China that commenced in December 2022, raises the prospect of global growth, it could also lead to renewed inflationary pressures as demand for commodities and other goods rises. However, there are still short-term risks, as any surge in Covid-19 infections in China may dampen confidence and activity, and lead to the emergence of new vaccine-resistant variants of the virus.

We continue to monitor the situation closely, and given the continuing uncertainties related to the post-pandemic landscape, additional mitigating actions may be required.

Our material banking risks

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

Description of risks – banking operations

Risks	Arising from	Measurement, monitoring and management of risk
Credit risk (see page 145)		
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 derivatives.	Credit risk is: • measured as the amount that could be lost if a customer or counterparty fails to make repayments; • monitored using various internal risk management measures and 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.
Treasury risk (see page 202)		
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 and transactional 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.	Treasury risk is: • 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.
Market risk (see page 218)		
Market risk is the risk of an adverse financial impact on trading activities arising from changes in market parameters such as interest rates, foreign exchange rates, asset prices, volatilities, correlations and credit spreads.	Exposure to market risk is separated into two portfolios: trading portfolios and non-trading portfolios. Market risk for non-trading portfolios is discussed in the Treasury risk section on page 214. Market risk exposures arising from our insurance operations are discussed on page 237.	Market risk is: • measured using sensitivities, value at risk 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 value at risk, stress testing and other measures; and • managed using risk limits approved by the Group Risk Management Meeting and the risk management meetings in various global businesses.

Description of risks – banking operations (continued)

Risks	Arising from	Measurement, monitoring and management of risk
Climate risk (see page 221)		
Climate risk relates to the financial and non-financial impacts that may arise as a result of climate change and the move to a greener economy.	Climate risk can materialise through: • physical risk, which arises from the increased frequency and severity of weather events; • transition risk, which arises from the process of moving to a low-carbon economy; and • greenwashing risk, which arises from the act of knowingly or unknowingly misleading stakeholders regarding our strategy relating to climate, the climate impact/benefits of a product or service, or the climate commitments or performance of our customers.	Climate risk is: • measured using a variety of risk appetite metrics and key management indicators, which assess the impact of climate risk across the risk taxonomy; • monitored using stress testing; and • managed through adherence to risk appetite thresholds and via specific policies.
Resilience risk (see page 230)		
Resilience risk is the risk of sustained and significant business disruption from execution, delivery, physical security or safety events, causing the inability to provide critical services to our customers, affiliates, and counterparties.	Resilience risk arises from failures or inadequacies in processes, people, systems or external events.	Resilience risk is: • measured using 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.
Regulatory compliance risk (see page 231)		
Regulatory compliance risk is the risk associated with breaching our duty to clients and other counterparties, inappropriate market conduct and breaching related financial services regulatory standards.	Regulatory compliance risk arises from the failure to observe relevant laws, codes, rules and regulations and can manifest itself in poor market or customer outcomes and lead to fines, penalties and reputational damage to our business.	Regulatory compliance risk is: • measured by reference to risk appetite, 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 help ensure their observance. Proactive risk control and/or remediation work is undertaken where required.
Financial crime risk (see page 231)		
Financial crime risk is the risk that HSBC's products and services will be exploited for criminal activity. This includes fraud, bribery and corruption, tax evasion, sanctions and export control violations, money laundering, terrorist financing and proliferation financing.	Financial crime risk arises from day-to-day banking operations involving customers, third parties and employees.	Financial crime risk is: • measured by reference to risk appetite, identified metrics, incident assessments, regulatory feedback and the judgement of, and assessment by, our 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 help ensure their observance. Proactive risk control and/or remediation work is undertaken where required.
Model risk (see page 232)		
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.	Model risk arises in both financial and non-financial contexts whenever business decision making includes reliance on models.	Model risk is: • 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.

Our insurance manufacturing subsidiaries are regulated separately from our banking operations. Risks in our insurance entities are managed using methodologies and processes that are subject to Group oversight. Our insurance operations are also subject to many of the same risks as our banking operations, and these are covered by the Group's risk management processes. However, there are specific risks inherent to the insurance operations as noted below.

Description of risks – insurance manufacturing operations

Risks	Arising from	Measurement, monitoring and management of risk
Financial risk (see page 237)		
For insurance entities, financial risk includes the risk of not being able to effectively match liabilities arising under insurance contracts with appropriate investments and that the expected sharing of financial performance with policyholders under certain contracts is not possible.	Exposure to financial risk arises from: • market risk affecting 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: • measured for credit risk, in terms of economic capital and the amount that could be lost if a counterparty fails to make repayments; for market risk, in terms of economic capital, internal metrics and fluctuations in key financial variables; and for liquidity risk, 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.
Insurance risk (see page 238)		
Insurance risk is the risk that, over time, the cost of insurance policies written, including claims and benefits, may exceed the total amount of premiums and investment income received.	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: • 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.