2019

The Hongkong and Shanghai Banking Corporation Limited, Bangkok Branch

Pillar 3 Disclosures at 31 December 2019

HSBC

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Cautionary statement regarding forward-looking statements

The *Pillar 3 Disclosures 2019* contains certain forward-looking statements with respect to the financial condition of The Hongkong and Shanghai Banking Corporation Limited, Bangkok Branch ('the Bank'), results of operations, capital position and business.

Statements that are not historical facts, including statements about the Bank's beliefs and expectations, are forward-looking statements. Words such as 'expects', 'targets', 'anticipates', 'intends', 'plans', 'believes', 'seeks', 'estimates', 'potential' and 'reasonably possible', variations of these words and similar expressions are intended to identify forward-looking statements. These statements are based on current plans, estimates and projections, and therefore undue reliance should not be placed on them. Forward-looking statements speak only as of the date they are made. The Bank makes no commitment to revise or update any forward-looking statements to reflect events or circumstances occurring or existing after the date of any forward-looking statements.

Forward-looking statements involve inherent risks and uncertainties. Readers are cautioned that a number of factors could cause actual results to differ, in some instances materially, from those anticipated or implied in any forward-looking statement. These include, but are not limited to:

- changes in general economic conditions in the markets in which we operate,
- changes in government policy and regulation, including the monetary, interest rate and other policies of central banks and other regulatory authorities, and
- factors specific to the Bank, including our success in adequately identifying the risks we face, such as the incidence of loan losses or delinquency, and managing those risks (through account management, hedging and other techniques).

Introduction

Purpose

This document comprises the Bank's Pillar 3 disclosures on capital and risk management at 31 December 2019. It meets the regulatory disclosure requirements under the Bank of Thailand ('BoT') Notification dated 2 May 2013, Re: The Public Disclosure of Capital Maintenance for Commercial Banks. It also serves to comply with the disclosures on Liquidity Coverage Ratio as required by the BoT's Notification dated 25 January 2018, Re: Liquidity Coverage Ratio Disclosure Standards.

References to 'HSBC', 'the Group' or 'the HSBC Group' within this document mean HSBC Holdings plc together with its subsidiaries.

These disclosures are governed by the Bank's disclosure policy, which has been approved by the Asset and Liability Management Committees ('ALCOs').

Additional relevant information may be found in the Bank's annual financial statements for the year ended 31 December 2019.

Key regulatory information

Regulatory capital

THB 20,100m

2018: THB 20,100m

Capital ratio

17.5%

2018: 19.5%

Regulatory framework

The Bank calculates capital for prudential regulatory reporting purposes using the announcement of the BoT regarding a capital adequacy framework based on the Basel III framework : 'A global regulatory framework for more resilient banks and banking systems' issued by the Basel Committee on Banking Supervision ('Basel Committee').

The Basel Committee's framework is structured around three 'pillars': the Pillar 1 minimum capital requirements and Pillar 2 supervisory review process are complemented by Pillar 3 market discipline. The aim of Pillar 3 is to produce disclosures that allow market participants to assess the scope of application by banks of the Basel Committee's framework and the rules in their jurisdiction, their capital condition, risk exposures and risk management processes, and hence their capital adequacy.

Pillar 3 requires all material risks to be disclosed to provide a comprehensive view of a bank's risk profile.

Pillar 3 disclosures

The Pillar 3 Disclosures 2019 comprise all information required under Pillar 3, both quantitative and qualitative. They are made in accordance with Section 5.3.3 of the BoT's notification Re: Regulations on Capital Supervision for Commercial Banks. These disclosures are supplemented by additional requirements of the BoT regarding Liquidity Coverage Ratio ('LCR').

Frequency

We published comprehensive Pillar 3 Disclosures annually with an update of certain quantitative capital requirement disclosures, market risk information together with liquidity and funding risk, at the half year.

Media and location

The *Pillar 3 Disclosures 2019* on a standalone basis are available on our website: www.hsbc.co.th, whereas the Pillar 3 Disclosures 2019 of HSBC Holdings plc and its subsidiaries on a consolidated level and other information on HSBC are available on HSBC Group's website: www.hsbc.com.

Verification

Whilst the *Pillar 3 Disclosures 2019* are not required to be externally audited, the document has been appropriately verified internally in accordance with the Bank's policies on disclosure and its financial reporting and governance processes.

Scope of permissions

Credit risk

The Basel committee's framework applies three approaches of increasing sophistication to the calculation of Pillar 1 credit risk capital requirements. The most basic level, the standardised approach ('SA'), requires banks to use external credit ratings to determine the risk weightings applied to rated counterparties. Other counterparties are grouped into broad categories and standardised risk weightings are applied to these categories.

The next level, the foundation internal ratings based ('FIRB') approach, allows banks to calculate their credit risk capital requirements on the basis of their internal assessment of counterparty's probability of default ('PD'), but subjects their quantified estimates of exposure at default ('EAD') and loss given default ('LGD') to standard supervisory parameters. Finally, the advanced internal ratings based ('AIRB') approach allows banks to use their own internal assessment in determining PD and in quantifying EAD and LGD.

Counterparty credit risk ('CCR') in both the trading and non-trading books is the risk that the counterparty to a transaction may default before completing the satisfactory settlement of the transaction. Four approaches to calculating CCR and determining exposure values are defined by Basel Committee: mark-to-market, original exposure, standardised and Internal Model Method ('IMM'). These exposure values are used to determine capital requirements under one of the three approaches credit risk approaches; standardised, FIRB or AIRB.

For credit risk including CCR, with the BoT's approval, we have adopted the standardised approach. Internally, we use the mark-to-market and IMM approaches for managing and monitoring our CCR.

Market risk

Market risk capital requirements can be determined under either the standard rules or the Internal Models Approach ('IMA'). The latter involves the use of internal value at risk ('VaR') models to measure market risks and determine the appropriate capital requirement.

We have obtained approval from the BoT to apply a combined approach for market risk assessment to determine capital requirements. The standardised approach is used for Specific Interest Rate Risk and the Value at Risk model is used for general market, foreign exchange and interest rate risk.

Operational risk

Basel Committee allows firms to calculate their operational risk capital requirement under the basic indicator approach, the standardised approach or the advanced measurement approach.

We currently use the standardised approach in determining our operational risk capital requirement.

Capital

Approach and policy

Our approach to capital 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 base to support the risks inherent in our business and invest in accordance with our strategy, meeting local regulatory capital requirements at all times.

Our capital management process culminates in the annual Group capital plan, which is approved by the Board. HSBC Holdings is the primary provider of equity capital to its subsidiaries and also provides them with non-equity capital where necessary. These investments are substantially funded by HSBC Holdings' issuance of equity and non-equity capital and by profit retention.

We manage our own capital to support our planned business growth and meet our local regulatory requirements within the context of the Group capital plan. Capital generated by us in excess of planned requirements is returned to our Head Office, normally by way of profit remittance, in accordance with the Bank's capital plan.

Capital conservation buffer

To align with the Basel III framework, the BoT contemplates a capital conservation buffer ('CCB'). The CCB was designed to ensure banks build up capital outside periods of stress that can be drawn down when losses are incurred and is set at 2.5%. The BoT has phased in this buffer from 1 January 2016 to 1 January 2019 which result in minimum capital ratio at 1 January 2019 of 11%.

Composition of regulatory capital

The BoT has issued the notification to revise the components of regulatory capital. Items that do not reflect true capital are added to the regulatory adjustments to be applied to the regulatory capital i.e. goodwill, intangible assets, gains on sale related to securitisation transactions and significant investments in common shares and warrants to be in line with the Basel III framework.

At 31 December 2019, we have an allocated and registered capital fund with the BoT of Baht 20,100 million *(30 June 2019 and 31 December 2018 : Baht* 20,100 *million and Baht* 20,100 *million, respectively)*. Intangible assets is the regulatory adjustment with immaterial to our regulatory capital. The detail can be summarised as follows:

Table 1 : Capital Structure

	31 December 2019 THBm	30 June 2019 THBm	31 December 2018 THBm
Assets maintained under Section 32	**21,944**	**20,707**	**20,624**
Sum of net capital for maintenance of assets under Section 32 and net balance of inter-office accounts			
Net funds brought in to maintenance assets under Section 32	20,100	20,100	20,100
Net balance of inter-office accounts where the branch is the debtor to the head office and other branches of the same juristic person, the parent company and subsidiaries of the head office	1,607	9,011	8,173
Total	**21,707**	**29,111**	**28,273**
Regulatory Capital	**20,100**	**20,100**	**20,100**
Regulatory Capital after deducting capital add-on from Single Lending Limit	**20,100**	**20,100**	**19,898**

Table 2 : Capital Adequacy

Minimum capital requirement for credit risk classified by type of assets under the Standardised Approach

	31 December 2019 THBm	30 June 2019 THBm	31 December 2018 THBm
Performing claims			
Claims on sovereigns and central banks, and multilateral development banks (MDBs)	29	65	31
Claims on financial institutions, non-central government public sector entities (PSEs) treated as claims on financial institutions, and securities firms	1,348	1,293	1,118
Claims on corporates, non-central government public sector entities (PSEs) treated as claims on corporates	7,237	6,913	6,401
Claims on retail portfolios	13	12	13
Claims on housing loans	18	24	26
Other assets	19	18	17
Non-performing claims	4	8	10
Total minimum capital requirement for credit risk	**8,668**	**8,333**	**7,616**

Minimum capital requirement for market risk for positions in the trading book

	31 December 2019 THBm	30 June 2019 THBm	31 December 2018 THBm
Standardised approach - specific interest rate risk	6	8	-
Internal model approach	149	179	188
Total minimum capital requirement for market risk	**155**	**187**	**188**

Minimum capital requirement for operational risk

	31 December 2019 THBm	30 June 2019 THBm	31 December 2018 THBm
Standardised approach	942	901	926
Total minimum capital requirement for operational risk	**942**	**901**	**926**

Capital ratio

	31 December 2019 %	30 June 2019 %	31 December 2018 %
Total capital to risk-weighted assets	**17.5**	**18.1**	**19.5**
Total capital to risk-weighted assets after deducting capital add-on from Single Lending Limit	**17.5**	**18.1**	**19.4**
Minimum capital ratio including CCB according to the BoT	**11.0**	**11.0**	**10.375**

Risk exposure and assessment

Risk management framework and policies

Risk management framework
Enterprise risk management refers to the overall management of the risks that HSBC takes to achieve its strategic aims. We use an Enterprise Risk Management Framework ('ERMF') throughout the Group, in all geographies and by all businesses and functions. It provides the high-level risk management structures and processes we use to manage risks throughout HSBC. It is underpinned by our cultures and values of being open, connected and dependable to help us make the right decision and take risks in line with risk appetite.

The ERMF has five main components: Culture and Values, Risk Governance, Roles and Responsibilities, Processes and Tools, and Internal Control.

Risk culture in HSBC
HSBC's values of being open, connected and dependable are the bedrock of our risk culture. All employees are expected to reflect these values by acting with courageous integrity; speaking up, escalating concerns, and doing right by our customers, communities and each other. HSBC's conservative risk culture is amongst its signature strengths – it is key to the Group's past and continued success.

There are five key indicators of a sound risk culture - 'tone from the top', 'accountability', 'communication and challenge', 'performance management, reward and incentives' and 'learning and development'. The principles can be summarised as follows:

Tone from the top
Getting the right tone from the top is about more than communication. It is about the alignment of the behaviors of leaders with the values championed by the bank.

Accountability
Relevant employees at all levels should know and understand the Bank's core approach to risk, its risk appetite, and risk capacity. They should be capable of performing their roles, and be aware that they will be held accountable for their actions in relation to the Bank's risk-taking behavior.

Communication and challenge
Promoting an environment of open communication and effective challenge in which decision-making processes encourage a range of views; allow for testing of current practices; stimulate a positive, critical attitude among employees; and promoting an environment of open and constructive engagement.

Performance management, reward and incentives
How and what we reward sends an important cultural signal in terms of what we value in our culture.

Learning and development'
Having a strong risk culture also requires the skills to spot and manage risk. Risk forms a key part of our development programmes supplementing on the job experience.

Risk governance
We aim to govern enterprise risk management in an efficient and effective way, making sure there is adequate monitoring and escalation of matters relating to one or more of the risk types and the interaction and balance between them.

Global Risk owns enterprise risk management governance across the Group and the effective decision making principles as per below must be adopted throughout the organisation.

Formal governance:
Formal governance forums include boards, board committee and governance committees which serve as decision making bodies and are supported by formal processes including terms of reference, agendas and minutes of the meetings.

Informal governance:
Informal governance forums (i.e. management forums for information sharing/ working groups) are normally used to facilitate the related business or functional head's individual accountability.

Individual accountability:
The principle of individual accountability is exercised across the organisation and is fundamental to effective risk management. Decision are not taken by committees, but by specific individuals, in line with their delegated authority to ensure clear accountability. The Board and its committees remain collective decision-making bodies.

The behaviours inherent in individual accountability should cascade down through the organisation - every individual staff member has a role to play in risk management. Individuals, through the responsibilities set out in their role profiles, are empowered to make decision on a day to day basis.

Risk issues should be monitored and actively resolved by individuals as part of their roles, and significant issues should be escalated through reporting lines to heads - both through first and second line of defence.

In Thailand, Risk Management Meeting ('RMM') is chaired by Chief Risk Officer ('CRO') with membership made up of senior managers. RMM serves as the governance body for enterprise-wide risk management with particular focus on risk culture, risk appetite, risk profile and integration of risk management into the Bank's strategic objectives.

The members of Risk Management Meeting are Chief Executive Officer, Chief Risk Officer, Chief Financial Officer, Chief Operating Officer, Treasurer, Head of Global Banking, Head of Commercial Banking, Head of Financial Crime Compliance, Head of Regulatory Compliance, Head of Legal and Head of Human Resources. The RMM is chaired by CRO and convened at least ten times a year.

Roles and responsibilities
Every employee at HSBC is responsible for identification and management of risk within the scope of their role as part of the three lines of defence model. The three lines of defence model is an organisational structure that outlines the division of roles and responsibilities, defined by the activities performed. It is applicable to all individuals and to all risk types.

The first line of defence has ultimate ownership for risk and controls. It comprises of three key roles: Risk Owners, Control Owners and Business Risk and Control Managers ('BRCM'). Individuals can be both Risk Owners and Control Owners, depending on the activity(ies) they are undertaking.

Risk Owners may sit within Global Businesses or Global Function and are accountable for agreeing risk appetite and identifying, assessing, and managing risks for their business in line with the risk appetite.

Control Owners may sit within Global Business, Global Function or a third party. They are responsible for assessing and managing the processes, activities, or systems to ensure that they are operating effectively. They work with the Risk Owners to understand and manage the risks. BRCMs may sit within Global Business or Global Function. They are responsible for providing operational risk advice and control testing for their organisational area. They work closely with Risk Owners and Control Owners to ensure operational risk management activities are effectively executed.

The second line of defence reviews and challenges the activities of the first line of defence to ensure that they have met the minimum requirements for risk management. The second line of defence consists of CRO, Risk Stewards and the Operational Risk function. CRO is accountable for oversight and co-ordination of financial and non-financial risk management. Risk Stewards sit within the Global Functions. They perform the specialist role of setting policies and the oversight of the first line of defence activities for their given risk type. There are regional, country and global business Risk Stewards throughout the organisation who execute the responsibilities cascaded to them by the global Risk Steward.

The oversight responsibilities of Risk Stewards include but are not limited to:

- Providing advice on how their policies are to be implemented by the first line of defence;
- Providing independent review and challenge on the appropriateness of risk management activities undertaken by the first line of defence; and
- Providing independent review and challenge of the first line of defence risk reporting.

The Operational Risk function provides advice and guidance on the use of the Operational Risk Management Framework ('ORMF'). Operational Risk also challenges the effectiveness of the ORMF along with an overall assessment of the non-financial risk exposure.

The third line of defence is Internal Audit. They provide independent assurance to management that the bank's risk management, governance and internal control processes are designed and operating effectively.

Risk appetite

Risk appetite is a key component in our management of risk. It describes the aggregate level and risk types that we are willing to accept in achieving our medium to long-term business objectives. In HSBC, risk appetite is managed through a global risk appetite framework and articulated in a Risk Appetite Statement ('RAS'), which is reviewed and approved by the Bank's RMM on a bi-annual basis.

Risk appetite focus on key measure as follow:

- Earning
- Capital and Leverage
- Liquidity and Funding Risk
- Credit Risk
- Traded Risk
- Operational Risk

Enterprise risk management tools

Four key enterprise risk management tools support RMM:

1. Risk Appetite Profile;
2. Risk Map;
3. Top & Emerging Risks Report; and
4. Stress Testing

Each of these tools has a specific purpose but also work together to provide an overarching picture of HSBC's current and projected risk profile. These tools are presented to RMM.

Risk Appetite Profile monitors the actual performance of RAS metrics against the appetite and tolerance thresholds defined for each metric.

Risk Map provides a point-in-time view of the residual risk profile of HSBC across both financial and non-financial risks.

Top & Emerging Risks Report provides forward-looking and thematic analysis of risks which are often large scale events or external circumstances, difficult to predict and are often beyond the Bank's ability to directly control.

Stress Testing is an integral component of HSBC's enterprise risk management framework that supports our risk management and capital planning. It is a tool which allows us to understand the sensitivities of the core assumptions in our strategic and capital plans, and improve decision-making through balancing risk and return.

Internal Controls

Our internal controls help ensure we achieve our objectives in operational effectiveness and efficiency, reliable financial reporting, and in compliance with laws, regulations and policies. They also help ensure that our risk management activities operate as designed and that we carry out the management of risks appropriately.

HSBC's internal control structure consists of the following components:

- Policies and procedures
- Control activities
- Systems and infrastructure

In 2020, the ERMF and the ORMF was merged to Risk Management Framework (RMF). The framework remains largely unchanged with increased focus on conduct.

Our material banking risks

The material risk types associated with our banking operations are described in the follows tables:

Risks	Arising from	Measurement, monitoring and management of risk
Credit risk		
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 and trade finance 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.
Capital and liquidity risk		
Capital and liquidity risk is the risk of having insufficient capital, liquidity or funding resources to meet financial obligations and satisfy regulatory requirements.	Capital and liquidity risk arises from changes to the respective resources and risk profiles driven by customer behaviour, management decisions or the external environment.	Capital and liquidity risk is: • **measured** through appetites set as target and minimum ratios; • **monitored a**nd projected against appetites and by using stress and scenario testing; and • **managed** through control of capital and liquidity resources in conjunction with risk profiles and cash flows.
Market risk		
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.	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, including the sensitivity of net interest income and the sensitivity of structural foreign exchange; and • **managed** using risk limits approved by the Regional Market Risk Manager, the risk management meeting in various global businesses.

Risks	Arising from	Measurement, monitoring and management of risk
Resilience risk		
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: • **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		
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, which as a consequence incur fines and penalties and suffer damage to our business.	Regulatory compliance risk arises from the risk associated with breaching our duty to our customers and other counterparties, inappropriate market conduct and breaching other regulatory requirements.	Regulatory compliance risk is: • **measured** by reference to identified metrics, incident assessments, regulatory feedback and the judgement and assessment of our regulatory compliance team; • **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 and fraud risk		
Financial crime and fraud risk is the risk that we knowingly or unknowingly help parties to commit or to further potentially illegal activity, including both internal and external fraud.	Financial crime and fraud risk arises from day-to-day banking operations.	Financial crime and fraud risk is: • **measured** by reference to identified metrics, incident assessments, regulatory feedback and the judgement and assessment of our financial crime risk teams; • **monitored** against our financial crime risk appetite statements and metrics, the results of the monitoring and control 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		
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: • **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.

Pillar 2 and ICAAP

Pillar 2

We conduct an Internal Capital Adequacy Assessment Process ('ICAAP') to determine a forward-looking assessment of our capital requirements given our business strategy, risk profile, risk appetite and capital plan. This process incorporates the Group's risk management processes and governance framework. Our base capital plan undergoes stress testing. This, coupled with our economic capital framework and other risk management practices, is used to assess our internal capital adequacy requirements and inform our view of our internal capital planning buffer. The ICAAP is formally approved by the local Asset and Liability Management Committee ('ALCO'), which has the ultimate responsibility for the effective management of asset and liability allocation and capital plan to achieve the Bank's strategic objectives and risk appetite.

Internal capital adequacy assessment

Through the ICAAP, we examine our risk profile to ensure that capital resources:

- remain sufficient to support our risk profile and outstanding commitments;
- meet current regulatory requirements and that HSBC is well placed to meet those expected in the future;
- allow the Bank to remain adequately capitalised in the event of a severe economic downturn stress scenario; and
- remain consistent with our strategic and operational goals.

The ICAAP is examined by the BoT as part of its supervisory review and evaluation process. This examination informs the regulator's view of our Pillar 2 capital requirements.

Preserving our strong capital position remains a priority, and the level of integration of our risk and capital management helps to optimise our response to business demand for regulatory capital.

Credit risk

Overview and objective

Credit risk represents our largest regulatory capital requirement. This includes a capital requirement for counterparty credit risk in the banking and trading books. The principal objectives of our credit risk management function are:

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

Credit risk management

To assess our wholesale customer's credit risk, HSBC uses a two-dimensional architecture that separately assesses the risk of customer default (Probability of Default or PD) and the likely loss in the event of default (Loss Given Default or LGD).

PD is defined as the probability that the obligor defaults in respect of the exposure over a one-year period, irrespective of the term of facilities, whereas LGD measures the average loss that would be sustained on each facility owed by a customer, in percentage terms compared to the expected exposure at the time of default (Exposure at Default or EAD). PD, LGD and EAD are used to calculate Risk-Weighted Assets ('RWA') under the Internal Ratings Based Approach ('IRB').

PD is derived from Customer Risk Rating ('CRR') which is assigned based on customer financial statements and market data analysis, as well as qualitative elements and a final subjective overlay to better reflect any idiosyncratic elements of the customer's risk profile. CRR scale comprises 10 risk bands that further branch out to 23 risk buckets for IRB portfolios.

While the Bank uses IRB in management our credit risk, we use the Standardised Approach to calculate capital requirement for credit risks for the BoT's regulatory reporting purposes.

In term of provision, HSBC adopted the IFRS 9 on 1 January 2018 while locally adopt on 1 January 2020. However, locally, the Bank continues to report non-performing assets under substandard, doubtful, doubtful loss and loss accounts according to the BoT's guideline. The specific provision has been provided for non-performing assets/loans based on the estimated losses which were calculated by discounting expected future cash flows (inclusive of the value of security). The general provision has been calculated according to the BoT's guideline to meet the minimum requirement.

Further information on accounting policies for allowance for doubtful accounts is set out on page 16 of the Annual financial statements 2019.

The following tables set out credit risk exposure value according to regulatory requirement at 31 December 2019 and 2018.

Credit risk

General information on credit risk exposure

Table 3 : Credit risk exposure of significant on-balance sheet and off-balance sheet exposures before recognised credit risk mitigation at 31 December 2019 and 2018

	31 December 2019		31 December 2018	
	Average exposure value THBm	Exposure value THBm	Average exposure value THBm	Exposure value THBm
On-balance sheet				
Loans and advances, net	85,622	94,336	91,399	75,968
Investments in debt securities, net	83,161	80,131	76,742	76,802
Deposits (including accrued interest receivable)	3,277	2,493	4,287	4,954
Derivative assets	32,385	35,362	28,271	24,542
Total	**204,445**	**212,322**	**200,699**	**182,266**
Off-balance sheet				
Aval, guarantees and letter of credit	37,610	41,308	37,007	33,842
OTC derivatives	2,196,846	2,033,819	2,180,566	2,381,027
Undrawn commitment	77,642	78,050	77,032	77,554
Total	**2,312,098**	**2,153,177**	**2,294,605**	**2,492,423**

Remark:

- *Loans and advances represent loans to customers and interbank and money market placements including accrued interest receivable and net of deferred revenue and allowances for doubtful accounts.*
- *Investments in debt securities are measured at fair value excluding accrued interest receivable and net of any loss on impairment.*
- *Off-balance sheet represents the notional amounts before the application of a credit conversion factor.*

Table 4 : Credit risk exposure of significant on-balance sheet and off-balance sheet exposures before recognised credit risk mitigation – analysis by country or geographical area at 31 December 2019 and 2018

Exposure values are allocated to region based on the country of incorporation where the exposure was originated.

31 December 2019

Country or geographical area	On-balance sheet Total THBm	On-balance sheet Loans and advances THBm	On-balance sheet Investments in debt securities THBm	On-balance sheet Deposits THBm	On-balance sheet Derivative assets THBm	Off-balance sheet Total THBm	Off-balance sheet Aval, guarantees and letter of credit THBm	Off-balance sheet OTC derivatives THBm	Off-balance sheet Undrawn commitment THBm
Thailand	190,247	92,889	80,131	435	16,792	1,019,079	29,834	917,629	71,616
Asia Pacific (excluding Thailand)	11,299	6		9	11,284	765,909	4,088	760,021	1,800
North America and Latin America	4,424	-	-	27	4,397	245,796	5,802	235,438	4,556
Africa and Middle East	1,322	1,291	-	-	31	26	26	-	-
Europe	5,030	150	-	2,022	2,858	122,367	1,558	120,731	78
Total	**212,322**	**94,336**	**80,131**	**2,493**	**35,362**	**2,153,177**	**41,308**	**2,033,819**	**78,050**

31 December 2018

Country or geographical area	On-balance sheet Total THBm	On-balance sheet Loans and advances THBm	On-balance sheet Investments in debt securities THBm	On-balance sheet Deposits THBm	On-balance sheet Derivative assets THBm	Off-balance sheet Total THBm	Off-balance sheet Aval, guarantees and letter of credit THBm	Off-balance sheet OTC derivatives THBm	Off-balance sheet Undrawn commitment THBm
Thailand	161,151	73,964	76,802	444	9,941	1,190,730	21,020	1,099,381	70,329
Asia Pacific (excluding Thailand)	10,792	323	-	55	10,414	807,361	3,396	802,681	1,284
North America and Latin America	2,173	-	-	-	2,173	273,180	4,929	263,387	4,864
Africa and Middle East	1,433	1,433	-	-	-	218	163	-	55
Europe	6,717	248	-	4,455	2,014	220,934	4,334	215,578	1,022
Total	**182,266**	**75,968**	**76,802**	**4,954**	**24,542**	**2,492,423**	**33,842**	**2,381,027**	**77,554**

Table 5 : Credit risk exposure of significant on-balance sheet and off-balance sheet exposures before recognised credit risk mitigation – analysis by residual maturity at 31 December 2019 and 2018

	31 December 2019			31 December 2018		
	Less than 1 year THBm	Over 1 year THBm	Total THBm	Less than 1 year THBm	Over 1 year THBm	Total THBm
On-balance sheet						
Loans and advances, net	74,479	19,857	94,336	50,055	25,913	75,968
Investments in debt securities, net	38,260	41,871	80,131	41,357	35,445	76,802
Deposits (including accrued interest receivable)	2,493	-	2,493	4,954	-	4,954
Derivative assets	5,672	29,690	35,362	7,061	17,481	24,542
Total	**120,904**	**91,418**	**212,322**	**103,427**	**78,839**	**182,266**
Off-balance sheet						
Aval, guarantees and letter of credit	36,687	4,621	41,308	32,267	1,575	33,842
OTC derivatives	756,980	1,276,839	2,033,819	1,219,726	1,161,301	2,381,027
Undrawn commitment	73,319	4,731	78,050	72,423	5,131	77,554
Total	**866,986**	**1,286,191**	**2,153,177**	**1,324,416**	**1,168,007**	**2,492,423**

Table 6 : Outstanding loans including accrued interest receivable and investments in debt securities classified as doubtful loss before recognised credit risk mitigation – analysis by country or geographical area and asset classification as prescribed by the Bank of Thailand at 31 December 2019 and 2018

	31 December 2019				
	Loans including accrued interest receivable				Investments in debt securities classified as doubtful loss
Country or geographic area	Normal THBm	Special mentioned THBm	Doubtful loss THBm	Total THBm	THBm
Thailand	93,719	63	128	93,910	6
Asia Pacific (excluding Thailand)	6	-	-	6	-
North America and Latin America	-	-	-	-	-
Africa and Middle East	1,304	-	-	1,304	-
Europe	151	-	-	151	-
Total	**95,180**	**63**	**128**	**95,371**	**6**

	31 December 2018				
	Loans including accrued interest receivable				Investments in debt securities classified as doubtful loss
Country or geographic area	Normal THBm	Doubtful THBm	Doubtful loss THBm	Total THBm	THBm
Thailand	74,826	12	209	75,047	242
Asia Pacific (excluding Thailand)	326	-	-	326	-
North America and Latin America	-	-	-	-	-
Africa and Middle East	1,448	-	-	1,448	-
Europe	250	-	-	250	-
Total	**76,850**	**12**	**209**	**77,071**	**242**

Remark:

- *Loans represent loans to customers, interbank and money market, including accrued interest receivable and net of deferred revenue.*
- *Investments in debt securities for 2019 and 2018 classified as doubtful loss represent unrealised losses on revaluation according to the definition of BoT notifications No. 5/2559 dated 10 June 2016 Re: Classification and Provision of the Financial Institutions.*
- *The classification of assets for 2019 and 2018 shown above is in accordance with BoT notifications No. 5/2559 dated 10 June 2016 Re: Classification and Provision of the Financial Institutions.*

Table 7 : General provision, specific provision and bad debt written-off during the year against loans including accrued interest receivable and investments in debt securities – analysis by country or geographic area at 31 December 2019 and 2018

	31 December 2019			
	Loans including accrued interest receivable			
Country or geographic area	General provision THBm	Specific provision THBm	Bad debt written-off during the year THBm	Specific provision for investments in debt securities THBm
Thailand		90	52	6
Asia Pacific (excluding Thailand)		-	-	-
North America and Latin America		-	-	-
Africa and Middle East		-	-	-
Europe		-	-	-
Total	**945**	**90**	**52**	**6**

	31 December 2018			
	Loans including accrued interest receivable			
Country or geographic area	General provision THBm	Specific provision THBm	Bad debt written-off during the year THBm	Specific provision for investments in debt securities THBm
Thailand		178	-	242
Asia Pacific (excluding Thailand)		-	-	-
North America and Latin America		-	-	-
Africa and Middle East		-	-	-
Europe		-	-	-
Total	**925**	**178**	**-**	**242**

Remark:

- *Specific provisions for investments in debt securities represent unrealised losses on the revaluation of debt securities at the year end.*

Table 8 : Outstanding loans including accrued interest receivable before recognised credit risk mitigation – analysis by type of business and asset classification as prescribed by the Bank of Thailand at 31 December 2019 and 2018

Type of business	31 December 2019			
	Pass THBm	**Special mention THBm**	**Doubtful loss THBm**	**Total THBm**
Agriculture and mining	1,454	-	-	1,454
Financial sector	46,827	-	-	46,827
Manufacturing and commerce	31,460	62	128	31,650
Real estate business and construction	5,018	-	-	5,018
Public utilities and services	10,006	-	-	10,006
Housing loan	267	-	-	267
Others	148	1	-	149
Total	**95,180**	**63**	**128**	**95,371**

Type of business	31 December 2018			
	Pass THBm	**Doubtful THBm**	**Doubtful loss THBm**	**Total THBm**
Agriculture and mining	3,202	-	-	3,202
Financial sector	23,038	-	-	23,038
Manufacturing and commerce	32,473	-	209	32,682
Real estate business and construction	3,144	-	-	3,144
Public utilities and services	14,538	12	-	14,550
Housing loan	309	-	-	309
Others	146	-	-	146
Total	**76,850**	**12**	**209**	**77,071**

Remark: The classification of assets for 2019 and 2018 shown above is in accordance with BoT notifications No. 5/2559 dated 10 June 2016 Re: Classification and Provision of the Financial Institutions.

Table 9 : General provision, specific provision and bad debt written-off during the year against loans including accrued interest receivable – analysis by type of business at 31 December 2019 and 2018

	31 December 2019		
Type of business	**General provision THBm**	**Specific provision THBm**	**Bad debt written-off during the year THBm**
Agriculture and mining		-	-
Financial sector		-	-
Manufacturing and commerce		90	52
Real estate business and construction		-	-
Public utilities and services		-	-
Housing loan		-	-
Others		-	-
Total	**945**	**90**	**52**

	31 December 2018		
Type of business	**General provision THBm**	**Specific provision THBm**	**Bad debt written-off during the year THBm**
Agriculture and mining		-	-
Financial sector		-	-
Manufacturing and commerce		161	-
Real estate business and construction		-	-
Public utilities and services		-	-
Housing loan		17	-
Others		-	-
Total	**925**	**178**	**-**

Table 10 : Reconciliation of the movement in the general provision and specific provision against loans including accrued interest receivable at 31 December 2019 and 2018

	31 December 2019		
	General provision THBm	**Specific provision THBm**	**Total THBm**
Provisions at the beginning of year	925	178	1,103
Bad debts written-off during the year	-	(52)	(52)
Provisions charge (reversal) during the year	20	(36)	(16)
Provisions at the end of year	**945**	**90**	**1,035**

	31 December 2018		
	General provision THBm	**Specific provision THBm**	**Total THBm**
Provisions at the beginning of year	928	162	1,090
Bad debts written-off during the year	-	-	-
Provisions charge (reversal) during the year	(3)	16	13
Provisions at the end of year	**925**	**178**	**1,103**

Remark: The above information also includes interbank and money market transactions.

Table 11 : Net exposure of on-balance sheet and credit equivalent amount of off-balance sheet before recognised credit risk mitigation classified by type of assets under the Standardised Approach at 31 December 2019 and 2018

	31 December 2019		
	On-balance sheet THBm	**Off-balance sheet THBm**	**Total THBm**
Performing claims			
Claims on sovereigns and central banks, and MDBs	49,790	886	50,676
Claims on financial institutions, PSEs treated as claims on financial institutions, and securities firms	6,546	70,197	76,743
Claims on corporate, PSEs treated as claims on corporate	73,263	27,327	100,590
Claims on retail portfolios	149	-	149
Claims on housing loans	267	-	267
Other assets	35,670	-	35,670
Non-performing claims	38	57	95
Total	**165,723**	**98,467**	**264,190**

	31 December 2018		
	On-balance sheet THBm	**Off-balance sheet THBm**	**Total THBm**
Performing claims			
Claims on sovereigns and central banks, and MDBs	48,733	822	49,555
Claims on financial institutions, PSEs treated as claims on financial institutions, and securities firms	9,598	45,909	55,507
Claims on corporate, PSEs treated as claims on corporate	67,374	21,031	88,405
Claims on retail portfolios	146	-	146
Claims on housing loans	309	-	309
Other assets	25,040	-	25,040
Non-performing claims	48	97	145
Total	**151,248**	**67,859**	**219,107**

Remark:

- *The above information has been presented net of specific provision.*
- *Off-balance sheet amounts have been adjusted by the credit conversion factor and also included repo style transactions.*

Ratings from External Credit Assessment Institutions

For RWA calculation, credit risk under the Standardised Approach has been calculated based on the external credit ratings from External Credit Assessment Institutions ('ECAI'). The Bank uses external credit ratings from the following ECAIs which are approved by the BoT.

- Standard & Poor's Ratings Service;
- Moody's Investors Services;
- Fitch Ratings;
- Fitch Ratings (Thailand);
- TRIS Rating

Data files of external ratings from the nominated ECAIs are matched with customer records in our centralised credit database.

When calculating the risk-weighted value of an exposure using ECAI risk assessments, risk systems identify the customer in question and look up the available ratings in the central database, according to the BoT's rating selection rules as prescribed in the appendix 4 of the BoT's guideline on Minimum Capital Requirement for Credit Risk under the Standardised Approach. The systems then apply the BoT's prescribed credit quality step mapping to derive from the rating the relevant risk weight.

Exposures to, or guaranteed by, central governments and Banks of Thailand and denominated in local currency are eligible under Standardised Approach for a 0% risk weighting.

Table 12 : Net exposure of on-balance sheet and credit equivalent amount of off-balance sheet after recognised credit risk mitigation for each type of assets, classified by risk weight under the Standardised Approach at 31 December 2019 and 2018

	31 December 2019										
	Net exposures after recognised credit risk mitigation – Rated					**Net exposures after recognised credit risk mitigation – Unrated**					
Risk weight	**0%**	**20%**	**50%**	**100%**	**150%**	**0%**	**20%**	**50%**	**35%**	**75%**	**100%**
	THBm	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**
Performing claims											
Claims on sovereigns and central banks, and MDBs	78,553	-	684	-	-			-			-
Claims on financial institutions, PSEs treated as claims on financial institutions, and securities firms	-	31,134	6,378	6,445	-						-
Claims on corporate, PSEs treated as claims on corporate	-	3,131	1,383	15,622	-						71,933
Claims on retail portfolios										-	149
Claims on housing loans									79	-	188
Other assets						45,842	144				188
Risk weight			**50%**	**100%**	**150%**					**75%**	
Non-performing claims			-	38	57					-	

	31 December 2018										
	Net exposures after recognised credit risk mitigation – Rated					**Net exposures after recognised credit risk mitigation – Unrated**					
Risk weight	**0%**	**20%**	**50%**	**100%**	**150%**	**0%**	**20%**	**50%**	**35%**	**75%**	**100%**
	THBm	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**	**THBm**
Performing claims											
Claims on sovereigns and central banks, and MDBs	62,200	-	731	-	-			-			-
Claims on financial institutions, PSEs treated as claims on financial institutions, and securities firms	-	25,644	5,428	5,270	-						-
Claims on corporate, PSEs treated as claims on corporate	-	3,124	5,533	11,006	-						64,047
Claims on retail portfolios										-	146
Claims on housing loans									-	-	309
Other assets						33,713	111				182
Risk weight			**50%**	**100%**	**150%**					**75%**	
Non-performing claims			-	48	97					-	

Remark: Off-balance sheet represents the notional amounts after applied credit conversion factor.

Credit risk mitigation

Our approach when granting credit facilities is to do so on the basis of capacity to repay, rather than place primary reliance on credit risk mitigation. Depending on a customer's standing and the type of product, facilities may be provided unsecured. Mitigation of credit risk is a key aspect of effective risk management and takes many forms.

However, we promote the use of credit risk mitigation, justified by commercial prudence and capital efficiency. Specifically, detailed policies cover the acceptability, structuring and terms with regard to the availability of credit risk mitigation, for example in the form of collateral security. These policies, together with the setting of suitable valuation parameters, are subject to regular review to ensure that they are supported by empirical evidence and continue to fulfill their intended purpose.

Collateral
The most common method of mitigating credit risk is to take collateral. In the commercial and industrial sectors, charges are created over business assets such as premises, stock and debtors.

Financial collateral
In the institutional sector, trading facilities are supported by charges over financial instruments such as cash and debt securities. Financial collateral in the form of marketable securities is used in much of the Bank's over-the-counter ('OTC') derivatives activities and in securities financing transactions ('SFT') such as repos and reverse repos. Netting is used extensively and is a prominent feature of market standard documentation.

Policy and procedures
Policies and procedures govern the protection of our position from the outset of a customer relationship, for instance, in requiring standard terms and conditions or specifically agreed documentation permitting the offset of credit balances against debt obligations, and through controls over the integrity, current valuation and, if necessary, realisation of collateral security.

Valuing collateral
Valuation strategies are established to monitor collateral mitigants to ensure that they will continue to provide the anticipated secure secondary repayment source. Where collateral is subject to high volatility, valuation is frequent; where stable, less so. For market trading activities such as collateralised OTC derivatives and SFTs, we typically carry out daily valuations.

Recognition of risk mitigation
For banking book exposures, the simple approach is applied for financial collateral. Where credit risk mitigation is available in the form of eligible guarantees, non-financial collateral, or credit derivatives, the exposure is divided into covered and uncovered portions. The covered portion, which is determined after applying an appropriate 'haircut' for currency and maturity mismatch to the amount of the protection provided, attracts the risk weight of the protection provider. The uncovered portion attracts the risk weight of the obligor. For trading book exposures fully or partially covered by eligible financial collateral, the value of the exposure is adjusted under the financial collateral comprehensive method using supervisory volatility adjustments, including those arising from currency mismatch, which are determined by the specific type of collateral (and, in the case of eligible debt securities, their credit quality) and its liquidation period. The adjusted exposure value is subject to the risk weight of the obligor.

Table 13 : Exposure value under the Standardised Approach covered by collateral classified by type of assets and collateral at 31 December 2019 and 2018

	31 December 2019		31 December 2018	
	Eligible financial collateral THBm	Guarantee and credit derivatives THBm	Eligible financial collateral THBm	Guarantee and credit derivatives THBm
Performing claims				
Claims on financial institutions, PSEs treated as claims on financial institutions, and securities firms	39,200	1,742	20,692	2,870
Claims on corporate, PSEs treated as claims on corporate	304	14,516	298	9,507
Non-performing claims	1	57	1	57
Total	**39,505**	**16,315**	**20,991**	**12,434**

Market risk

Overview and objective

Market risk is the risk of 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 comprise positions arising from market-making.
- Non-trading portfolios comprise positions that primarily arise from the interest rate management of our commercial banking assets and liabilities, financial investments designated as held-to-collect and sale and held-to-maturity.

Where appropriate, we apply similar risk management policies and measurement techniques to both trading and non-trading portfolios. Our objective is to manage and control market risk exposures in order to optimise return on risk while maintaining a market profile consistent within our established risk appetite.

Market risk governance

The management of market risk is principally undertaken in Global Banking and Markets (‘GB&M’) using risk limits approved by the Regional Market Risk Manager, Regional RMM and Group Risk. Limits are set for portfolios, products and risk types, with market liquidity being a primary factor in determining the level of limits set.

Market risk measures

Our objective is to manage and control market risk exposures while maintaining a market profile consistent with our risk appetite.

We use a range of tools to monitor and limit market risk exposures including sensitivity analysis, VaR and stress testing.

Sensitivity analysis

Sensitivity analysis measures the impact of individual market factor movements on specific instruments or portfolios, including interest rates, foreign exchange rates and credit spreads, such as the effect of a one basis point change in yield. We use sensitivity measures to monitor the market risk positions within each risk type. Sensitivity limits are set for portfolios, products and risk types, with the depth of the market being one of the principal factors in determining the level of limits set.

Value at risk

VaR is a technique that estimates the potential losses in the trading portfolio from movements in market rates and prices over a specified time horizon at a particular level of confidence.

Our models are based on historical simulation that incorporate the following features:

- historical market rates and prices are calculated with reference to foreign exchange and interest rates, commodity prices, equity prices and the associated volatilities;
- potential market movements utilised for VaR are calculated with reference to data from the past two years (500 working days); and
- VaR measures are calculated at 99 percent confidence level and use a one-day holding period.

The models also incorporate the effect of 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 should always be viewed in the context of its limitations. For example:

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

Global Market Middle Office is responsible for preparing the VaR report and submitting it to local senior management for their consideration on a daily basis. If there are exceptions, the exception report has to be sent to local senior management and the regional market risk unit.

Stress testing

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

Stress testing is implemented at legal entity, regional and overall Group levels. A set of scenarios is used consistently across all regions within the Group. Scenarios are tailored to capture the relevant events or market movements at each level. The risk appetite around potential stress losses for the Group is set and monitored against referral limits.

In addition to Group's stress testing scenarios, we also perform stress testing using the scenarios as specified by the BoT, covering parallel and non-parallel shifts in interest rate yield curves and depreciation and appreciation in major currencies.

Back-testing

We routinely validate the accuracy of our VaR models by back-testing them against 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 actual number of profits or losses in excess of VaR over this period can therefore be used to gauge how well the models are performing.

According to BoT notification No. 94/2551 dated 27 November 2008 Re: Guideline on Supervision of Market Risk and Capital Requirement for Market Risk of Financial Institutions, VaR back-testing exceptions, on Hypothetical loss, are counted towards the multiplier determined by the BoT for the purposes of the capital requirement calculation for market risk. The additional capital multiplier will be added if the exceptions are greater than 4 times over the past 250 business days.

Managed risk positions

Interest rate risk
Interest rate risk arises within the trading portfolios, principally from mismatches, as a result of interest rate changes, between the future yield on assets and their funding cost.

This is measured, where practical, on a daily basis. We use a range of tools to monitor and control interest rate risk exposures. These include the present value of a basis point movement in interest rates, VaR, stress testing and sensitivity analysis.

Through our management of market risk in non-trading portfolios, we mitigate the effect of prospective interest rate movements that could reduce future net interest income, while balancing the cost of such hedging activities on the current net revenue stream.

Foreign exchange risk
Foreign exchange risk arises from movements in the relative value of currencies. In addition to VaR and stress testing, we control the foreign exchange risk within the trading portfolio by limiting the open exposure to individual currencies, and on an aggregate basis.

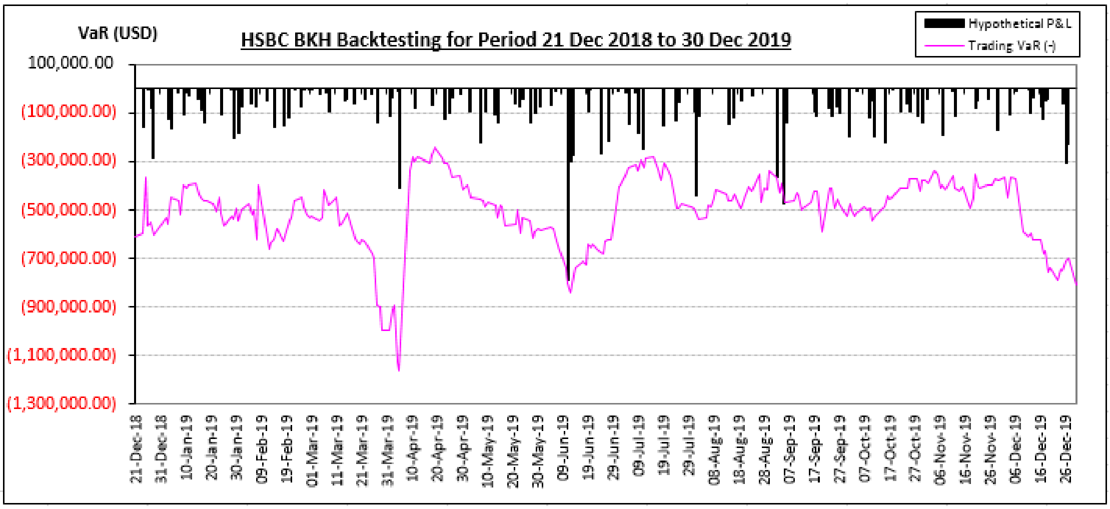
Specific issuer risk
Specific issuer (credit spread) risk arises from a change in the value of debt instruments due to a perceived change in the credit quality of the issuer or underlying assets. As well as through VaR and stress testing, we manage the exposure to credit spread movements within the trading portfolios with limits referenced to the sensitivity of the present value of a basis point movement in credit spreads.

Table 14 : Market risk information by Internal Model Approach at 31 December 2019, 30 June 2019 and 31 December 2018

	31 December 2019 THBm	30 June 2019 THBm	31 December 2018 THBm
Interest Rate Risk			
Maximum VaR during the period	73	113	75
Average VaR during the period	46	55	58
Minimum VaR during the period	32	22	37
VaR at the end of the period	68	61	61
Foreign Exchange Rate Risk			
Maximum VaR during the period	20	25	19
Average VaR during the period	6	10	4
Minimum VaR during the period	1	-	-
VaR at the end of the period	20	7	15
Total Market Risk			
Maximum VaR during the period	77	113	76
Average VaR during the period	47	56	59
Minimum VaR during the period	33	24	37
VaR at the end of the period	77	60	62

Remark: The period for Maximum VaR, Minimum VaR and Average VaR is 60 days interval. All figures are based on 10 days VaR as used for market risk capital charge calculation.

Table 15 : Back-testing result (considering loss side of Hypothetical P&L vs. Value at Risk)



Remark: There was one exception from VaR back-testing, on Hypothetical loss for the period 21 December 2018 to 30 December 2019. The exception was occurred on VaR date 3 September 2019.

Interest rate risk in the banking book

Overview

Interest rate risk in the banking book ('IRRBB') 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 and is monitored and controlled by Asset, Liability and Capital Management ('ALCM'). Interest rate risk in the banking book is transferred to and managed by Balance Sheet Management ('BSM') under the supervision of the local ALCO.

Governance and structure

ALCM monitors and controls non-traded interest rate risk. This includes reviewing and challenging the business prior to the release of new products and in respect of proposed behavioural assumptions used for hedging activities. The ALCM function is responsible for maintaining and updating the transfer pricing framework, informing the ALCO of the Group's overall banking book interest rate risk exposure and managing the balance sheet in conjunction with BSM.

BSM manages the banking book interest rate positions transferred to it within the Market Risk limits approved by RMM. The global businesses can only transfer non-trading assets and liabilities to BSM provided BSM can economically hedge the risk they receive. Hedging is generally executed through interest rate derivatives or fixed rate government bonds. Any interest rate risk which BSM cannot economically hedge is not transferred and will remain within the global business where the risk is originated.

Measurement of interest rate risk in the banking book

The table below sets out the effect on future net income of an incremental 100 basis points parallel rise in yield curves during the 12 months.

Table 16 : The effect of changes in interest rates to net interest income in the banking book at 31 December 2019 and 2018

Currency	Effect to net income 2019 THBm	2018 THBm
Baht	(21)	(3)
US Dollar	(43)	44
Others	-	4
Total effect of changes in interest rates to net interest income	**(64)**	**45**
Percentage of net effect to net future interest income	**(3.5%)**	**2.6%**

Equity exposures in the banking book

At 31 December 2019 and 2018, there is no equity investments.

Details of the Bank's accounting policy for investments may be found on pages 15, of the *Annual financial statements 2019*.

Operational risk

Overview and objective

Operational risk or now called non-financial risk. Non-financial risk is the risk to achieving our strategy or objectives as a result of inadequate or failed internal processes, people and systems or from external events.

Sound non-financial risk management is central to achieving good outcomes for our customers. Non-financial risk is relevant to every aspect of our business and is managed through the operational risk management framework ('ORMF'). It covers a wide spectrum of issues, such as resilience risk, financial crime and fraud, regulatory compliance, reporting and tax risk, legal risk, model risk, people risk and failure in other principle risk processing. Losses arising from breaches of regulation and law, unauthorised activities, error, omission, inefficiency, fraud, systems failure or external events all fall within the definition of non-financial risk.

The objective of our operational risk management is to manage and control operational risk in a cost-effective manner and within our risk appetite, as defined by GMB.

Organisation and responsibilities

Responsibility for managing non-financial risk lies with our people. During 2019, we continued to strengthen our approach to managing non-financial risk as set out in the ORMF. The framework sets out our approach to governance and risk appetite. It provides a single view of non-financial risks that matter the most and associated controls. The enhancement and embedding of the risk appetite framework for non-financial risk, and the improvement of the consistency of the adoption of the end-to-end risk and control assessment processes were a particular focus in 2019. While there remains more to do, we made progress in strengthening the control environment and the management of non-financial risk.

Activity to strengthen the three lines of defence model continued to be a key focus in 2019. The first line of defence owns the risk and is accountable for identifying, assessing, managing key existing and emerging risks. The second line of defence sets the policy and control standards to manage risks, and provides advice and guidance to support these policies. It also challenges the first line to ensure it is managing risk effectively. The third line of defence is Internal Audit, which provides independent assurance to the management that our risk management approach and processes are designed and operating effectively.

Measurement and monitoring

We have codified our ORMF in a high-level standard, supplemented by detailed policies. These policies explain our approach to identifying, assessing, monitoring and controlling non-financial risk and give guidance on mitigating actions to be taken when weaknesses are identified.

Monitoring non-financial risk exposure against risk appetite on a regular basis, and setting out our risk acceptance process, drives risk awareness in a more forward-looking manner. This assists management in determining whether further action is required.

Each business managers are responsible for maintaining an appropriate level of internal control, commensurate with the scale and nature of operations. They are responsible for identifying and assessing risks, designing controls and monitoring the effectiveness of these controls. The ORMF helps managers to fulfil these responsibilities by defining a standard risk assessment methodology and providing a tool for the systematic reporting of operational loss data.

Risk and control assessment approach
Non-financial risk and control assessments are performed by individual business units and functions. The risk and control assessment process is designed to provide business areas and functions with a forward-looking view of non-financial risks, an assessment of the effectiveness of controls, and a tracking mechanism for action plans so that they can proactively manage non-financial risks within acceptable levels.

Appropriate means of mitigation and controls are considered. These include:

- making specific changes to strengthen the internal control environment; and
- investigating whether cost-effective insurance cover is available to mitigate the risk.

Recording
We use a Group-wide risk management system to record the results of our non-financial risk management process. Non-financial risk and control assessments are input and maintained by business units. Business management monitors and follows up the progress of documented action plans. Operational risk losses are entered into the Group-wide risk management system and reported to governance on a monthly basis. Loss capture thresholds are in line with industry standards.

Liquidity and funding risk

Overview

Liquidity risk is the risk that the bank does not have sufficient financial resources to meet its obligations when they fall due, or will have to do so at excessive cost. Funding risk is the risk that funding considered to be sustainable, and therefore used to fund assets, is not sustainable over time. The liquidity risk arises from mismatches in the timing of cashflows. Funding risk arises when the necessary liquidity to fund illiquid asset positions cannot be obtained at the expected terms and when required.

Liquidity and funding risk management

HSBC has an internal liquidity and funding risk management framework ('LFRF') which aims to allow it to withstand very severe liquidity stresses. It is designed to be adaptable to changing business models, markets and regulations.

The management of liquidity and funding is primarily carried out locally in accordance with the Group's LFRF, and with practices and limits set by the local ALCO and regional Head Office. Our general policy is that each operating entity should be self-sufficient in funding its own activities.

Governance and structure

The elements of the LFRF are underpinned by a robust governance framework, the two major elements of which are:

- the Asset and Liability Management Committees ('ALCOs'); and
- the internal liquidity adequacy assessment process ('ILAAP') used to validate risk tolerance and set risk appetite

Asset, Liability and Capital Management ('ALCM') teams are responsible for the application of the LFRF at a local operating entity level and assists ALCO to review liquidity and funding risks to ensure their prudent management. ALCM manages the balance sheet with a view to achieve efficient allocation and utilization of all resources.

The BSM team within Global Markets is responsible for managing cash, short-term liquidity and funding for the entity. This includes deployment of the commercial surplus as well as accessing wholesale senior funding markets if needed.

ILAAP and risk appetite

Under HSBC's LFRF, the operating entities are required to meet internal minimum requirements and any applicable regulatory requirements at all times. These requirements are assessed through the internal ILAAP, which is used to ensure that operating entities have robust strategies, policies, processes and systems for the identification, measurement, management and monitoring of liquidity risk over an appropriate set of time horizons, including intra-day, so as to ensure they maintain adequate levels of liquidity buffers. It informs the validation of risk tolerance and the setting of risk appetite. These metrics are set and managed locally but are subject to robust global and regional review and challenge to ensure consistency of approach and application of the LFRF across the Group.

The critical Board-level appetite measures are the liquidity coverage ratio ('LCR') and net stable funding ratio ('NSFR'). An appropriate funding and liquidity profile is managed through a wider set of measures:

- a minimum LCR requirement;
- a minimum NSFR requirement;
- a minimum LCR requirement by material currency;
- a depositor concentration limit;
- the three-month and twelve-month cumulative rolling term contractual maturity limits covering deposits from banks and non-bank financial institutions and securities issued;
- a management and monitoring of intraday liquidity;
- the application of liquidity funds transfer pricing; and
- forward-looking funding assessments.

Liquidity and funding risk metrics are monitored daily and/or monthly and reported to ALCO regularly.

Measurement and monitoring

BoT issued a Notification dated 27 May 2015 Re: Guidelines on Liquidity Coverage Ratio, where commercial banks are required to maintain high-quality liquid assets relative to net cash outflows within the 30-day time horizon under liquidity stress scenarios of at least 60% starting from 1 January 2016 and the ratio will be increased by 10% each year until it reaches 100% on 1 January 2020. 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 severe liquidity stress scenario. Commercial banks are required to maintain the LCR in accordance with the guidelines as specified by the BoT.

The Bank manages its LCR position daily within the internal appetite limit which includes a buffer in excess of the regulatory requirement. The Bank actively considers the impact of business decisions on the LCR.

In addition, the Bank maintains a diversified funding base with projections of balance sheet and NSFR discussed in monthly ALCO meetings to ensure the Bank remains well-funded to support the business strategy. The Bank regularly examines its liquidity gaps and introduced the internal metrics on funding concentration to monitor funding risks.

Also, the Bank maintain the contingency plans that can be enacted in the event of internal or external triggers, which threaten the liquidity or funding position. The contingency plans set out a range of appropriate management actions, which could feasibly be executed in a stressed environment to recover the position.

Liquidity coverage ratio disclosure

Table 17 and table 18 set out the disclosure items under the LCR disclosure standard template as specified by the BoT.

The average value of the LCR and related components is calculated by the simple average method, which is the average of three data points (month-end data) over a particular quarter.

Explanations of the LCR disclosure template can be found in the Glossary section.

Further details of the Group's liquidity and funding risk management and disclosures can be viewed in the Annual Report and Accounts 2019 and the Pillar 3 Disclosure at 31 December 2019, which is available on HSBC Group's website: www.hsbc.com, under Investors section.

Table 17 : Liquidity coverage ratio

	Average Balance	
	2019 Quarter 4 THBm	**2018 Quarter 4 THBm**
(1) Total high-quality liquid assets (HQLA)	71,311	58,173
(2) Total net cash outflows within the 30-day time horizon	34,788	24,491
(3) Percentage of Liquidity Coverage Ratio (%LCR)	**209%**	**273%**
Minimum percentage of LCR as specified by the BoT	**90%**	**80%**

Table 18 : Comparative data of LCR

	2019 Average LCR %	**2018 Average LCR %**
Quarter 3	213	205
Quarter 4	209	273

The Bank maintains a healthy liquidity position with the average LCR for the 4th quarter of 2019 of 209%, which is 119% higher than the minimum LCR requirement as specified by the BoT. This LCR is the average of LCRs as at the end of October – 260%, November – 193% and December – 174%. The LCR consists of 2 main components;

1. High-quality liquid assets ('HQLA') include unencumbered high-quality assets with low risk and low volatility that can be easily liquidated through sale or repurchase transactions without any significant changes to their values, even in times of liquidity stress. The value of each type of HQLA is after the application of both haircuts and any applicable caps as specified by the BoT.

   The average HQLA of the Bank for the 4th quarter of 2019 is Baht 71,311 million, which is the average of HQLA as at the end of October – December. 98% of the average HQLA included in the LCR are Level 1 assets as specified by the BoT, which consist mainly of cash and Baht denominated government and central bank debt securities. The Bank maintains a well-diversification of HQLA to support the regulatory and internal requirements.

2. The amount of net cash outflows is equal to expected cash outflows within the 30-day time horizon minus expected cash inflows within the 30-day time horizon under liquidity stress scenarios; but the expected cash inflows must not exceed 75% of the expected cash outflows.

   The average net cash outflows of the Bank for the 4th quarter of 2019 is Baht 34,788 million, which is the average of net cash outflows within the 30-day time horizon as at the end of October – December.

   The expected cash outflows on which the Bank focuses under the severe liquidity stress scenarios are the run-off of unsecured wholesales deposits and borrowings, repayments of secured borrowings under repurchase agreements (repos), derivative cash outflows to which the specified BoT run-off rates applied. The cash outflows arising from contingent funding, obligations and collateral requirements such repo funding and derivatives are also captured with the run-off rate assigned by the BoT.

   The expected cash inflows are majority from performing customer's loan repayments, maturing deposits placement and derivative cash inflows, to which the specified BoT inflow rates applied.

Abbreviation	Brief description
A	
ALCO	Asset and Liability Management Committee
AIRB	Advanced Internal Ratings Based Approach
B	
Bank	The Hongkong and Shanghai Banking Corporation Limited, Bangkok Branch
Basel Committee	The Basel Committee on Banking Supervision
BoT	The Bank of Thailand
BRCM	Business Risk and Control Managers
BSM	Balance Sheet Management
C	
CCB	Capital Conservation Buffer
CCR	Counterparty Credit Risk
CEO	Chief Executive Officer
CRO	Chief Risk Officer
CRR	Customer Risk Rating
E	
EAD	Exposure at Default
ECAI	External Credit Assessment Institutions
ERMF	Enterprise Risk Management Framework
F	
FIRB	Foundation Internal Ratings Based Approach
G	
GB&M	Global Banking and Markets, a global business
GMB	Group Management Board
Group	HSBC Holdings together with its subsidiary undertakings
H	
HQLA	High-quality liquid assets
HSBC	HSBC Holdings together with its subsidiary undertakings
I	
ICAAP	Internal Capital Adequacy Assessment Process
IFRS	International Financial Reporting Standard
ILAAP	Internal Liquidity Adequacy Assessment Process
IMA	Internal Models Approach
IMM	Internal Model Method
IRB	Internal Ratings Based Approach
L	
LCR	Liquidity Coverage Ratio
LFRF	Liquidity and Funding Risk Management Framework
LGD	Loss Given Default
M	
MDB	Multilateral Development Bank
N	
NSFR	Net Stable Funding Ratio
O	
ORMF	Operational Risk Management Framework
OTC	Over-the-Counter

Abbreviation	Brief description
P	
PD	Probability of Default
PSE	Public Sector Entities
R	
RAS	Risk Appetite Statement
RMM	Risk Management Meeting
RWA	Risk-Weighted Asset
S	
SA	Standardised Approach
SFT	Securities Financing Transactions
V	
VaR	Value at Risk

Term	Definition
B	
Back-testing	A statistical technique used to monitor and assess the accuracy of a model, and how that model would have performed had it been applied in the past.
Basel II	The capital adequacy framework issued by the Basel Committee on Banking Supervision in June 2006 in the form of the 'International Convergence of Capital Measurement and Capital Standards', amended by subsequent changes to the capital requirements for market risk and re-securitisations, commonly known as Basel 2.5, which took effect from 31 December 2011.
Basel III	In December 2010, the Basel Committee issued 'Basel III rules: a global regulatory framework for more resilient banks and banking systems' and 'International framework for liquidity risk measurement, standards and monitoring'. Together, these documents present the Basel Committee's reforms to strengthen global capital and liquidity rules with the goal of promoting a more resilient banking sector. In June 2011, the Basel Committee issued a revision to the former document setting out the finalised capital treatment for counterparty credit risk in bilateral trades.
Basis point ('bps')	One hundredth of a per cent (0.01%), so 100 basis points is 1%. For example, this is used in quoting movements in interest rates or yields on securities.
C	
Capital conservation buffer ('CCB')	A capital buffer prescribed by regulators under Basel III and designed to ensure banks build up capital buffers outside periods of stress that can be drawn down as losses are incurred. Should a bank's capital levels fall within the capital conservation buffer range, capital distributions will be constrained by the regulators.
Compliance risk	The risk that the Bank fails to observe the letter and spirit of all relevant laws, codes, rules, regulations and standards of good market practice, and incurs fines and penalties and suffers damage to its business as a consequence.
Counterparty credit risk	Counterparty credit risk is the risk that the counterparty to a transaction may default before completing the satisfactory settlement of the transaction.
Credit quality step	A step in the Bank of Thailand credit quality assessment scale which is based on the credit ratings of ECAIs. It is used to assign risk weights under the standardised approach.
Credit risk	The risk of financial loss if a customer or counterparty fails to meet an obligation under a contract. It arises principally from direct lending and trade finance business but also from other products such as guarantees, credit derivatives and from holding assets in the form of debt securities.
Credit risk mitigation	A technique to reduce the credit risk associated with an exposure by application of credit risk mitigants, such as collateral, guarantees and credit derivatives.

Term	Definition
D	
Debt securities	Financial assets on the Bank's balance sheet representing certificates of indebtedness of credit institutions, public bodies or other undertakings.
E	
Economic capital	The internally calculated capital requirement that is deemed necessary by HSBC to support the risks to which it is exposed.
Exposure	A claim, contingent claim or position which carries a risk of financial loss.
Exposure at default ('EAD')	The amount expected to be outstanding after any credit risk mitigation, if and when the counterparty defaults. EAD reflects drawn balances as well as allowance for undrawn amounts of commitments and contingent exposures.
F	
Funding risk	A form of liquidity risk arising when the liquidity needed to fund illiquid asset positions cannot be obtained at the expected terms and when required.
G	
Global functions	Global functions establish and manage all policies, processes and delivery platforms relevant to their activities. There are 11: Global Communications; Global Company Secretary; Global Finance; Global HR; Global Internal Audit; Global Legal; Global Marketing; Global Risk (including Compliance); Global Sustainability; HSBC Operations, Services and Technology; and Strategy and Planning.
Guarantee	An undertaking by a party to pay a creditor should a debtor fail to do so.
H	
Haircut	A discount applied when determining the amount at which an asset can be realised. The discount takes into account the method of realisation, including the extent to which an active market for the asset exists. With respect to credit risk mitigation, a downward adjustment to collateral value to reflect any currency or maturity mismatches between the credit risk mitigant and the underlying exposure to which it is being applied. Also a valuation adjustment to reflect any fall in value between the date the collateral was called and the date of liquidation or enforcement.
High-quality liquid assets (HQLA)	Total high-quality liquid assets" (HQLA) is defined as the sum of liquid assets with the features as specified by the BoT as follows: I. Characteristics of liquid assets II. Guidelines on the calculation of liquid assets III. Operational requirements IV. Diversification of liquid assets The total HQLA is the value of total HQLA after the application of both haircuts and any applicable caps as specified by the BoT.

Term	Definition
I	
Impairment allowances	Management's best estimate of losses incurred in the loan portfolios at the balance sheet date.
Internal Capital Adequacy Assessment Process ('ICAAP')	The Bank's own assessment of the levels of capital that it needs to hold through an examination of its risk profile from regulatory and economic capital viewpoints.
Internal Model Method ('IMM')	One of three approaches defined in the Basel framework to determine exposure values for counterparty credit risk.
Internal ratings-based ('IRB')	A method of calculating credit risk capital requirements using internal estimates of risk parameters.
L	
Liquidity risk	The risk that the Bank does not have sufficient financial resources to meet its obligations as they fall due, or will have to do so at an excessive cost. This risk arises from mismatches in the timing of cash flows.
M	
Market risk	The risk that movements in market risk factors, including foreign exchange rates and commodity prices, interest rates, credit spreads and equity prices will reduce income or portfolio values.
N	
Net interest income	The amount of interest received or receivable on assets net of interest paid or payable on liabilities.
O	
Operational risk	The risk of loss resulting from inadequate or failed internal processes, people and systems, or from external events, including legal risk.
Over-the-counter ('OTC')	A bilateral transaction (e.g. derivatives) that is not exchange traded and that is valued using valuation models.
P	
Percentage of Liquidity Coverage Ratio (%LCR)	LCR is the ratio of total HQLA to total net cash outflows within the 30-day time horizon.
Probability of default ('PD')	The probability that an obligor will default within one year.
R	
Regulatory capital	The capital which the Bank holds, determined in accordance with rules established by the BoT.
Repo/reverse repo (or sale and repurchase agreement)	A short-term funding agreement that allows a borrower to create a collateralised loan by selling a financial asset to a lender. As part of the agreement, the borrower commits to repurchase the security at a date in the future repaying the proceeds of the loan. For the party on the other end of the transaction (buying the security and agreeing to sell in the future), it is a reverse repurchase agreement or a reverse repo.
Reputational risk	The risk that illegal, unethical or inappropriate behaviour by the Bank itself, members of staff or clients or representatives of the Bank, will damage HSBC's reputation, leading, potentially, to a loss of business, fines or penalties.

Term	Definition
R	
Risk appetite	The aggregate level and types of risk a firm is willing to assume within its risk capacity to achieve its strategic objectives and business plan.
Risk-weighted assets ('RWA's)	Calculated by assigning a degree of risk expressed as a percentage (risk weight) to an exposure value.
S	
Securitisation	A transaction or scheme whereby the credit risk associated with an exposure, or pool of exposures, is tranched, and where payments to investors in the transaction or scheme are dependent upon the performance of the exposure or pool of exposures. A traditional securitisation involves the transfer of the exposures being securitised to a SPE that issues securities. In a synthetic securitisation, the tranching is achieved by the use of credit derivatives and the exposures are not removed from the balance sheet of the originator.
Standardised approach ('SA')	In relation to credit risk, a method for calculating credit risk capital requirements using ratings agencies and supervisory risk weights. In relation to operational risk, a method of calculating the operational capital requirement by the application of a supervisory defined percentage charge to the gross income of eight specified business lines.
T	
Total net cash outflows within the 30-day time horizon	The term "total net cash outflows within the 30-day time horizon" is defined as the sum of all types of expected cash outflows within the 30-day time horizon multiplied by respective run-off rates minus the sum of all types of expected cash inflows within the 30-day time horizon multiplied by respective inflow rates, but no more than 75% of total expected cash outflows as specified by the BoT.

Total net cash outflows within the 30-day time horizon under liquidity stress scenarios	= Total expected cash outflows within the 30-day time horizon under liquidity stress scenarios	- Total expected cash inflows within the 30-day time horizon under liquidity stress scenarios

Term	Definition
V	
Value at risk ('VaR')	A measure of the loss that could occur on risk positions as a result of adverse movements in market risk factors (e.g. rates, prices, volatilities) over a specified time horizon and to a given level of confidence.