2016

The Hongkong and Shanghai Banking Corporation Limited, Bangkok Branch

Pillar 3 Disclosures at 31 December 2016

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Cautionary statement regarding forward-looking statements

The *Pillar 3 Disclosures 2016* 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', '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 discretionary risk-weighted asset ('RWA') growth and 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 2016 to meet the regulatory disclosure requirements under the Bank of Thailand ('the BoT') Notification dated 2 May 2013, Re: The Public Disclosure of Capital Maintenance for Commercial Banks.

Additional relevant information may be found in the Bank's annual financial statements for the year ended 31 December 2016.

Key regulatory information

Regulatory capital

THB 20,100m

2015: THB 20,100m

Capital ratio

18.7%

2015: 17.4%

The Hongkong and Shanghai Banking Corporation Limited is a subsidiary of HSBC Holdings plc ('HSBC' or 'the Group').

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, both quantitative and qualitative which 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, enabling a comprehensive view of a bank's risk profile.

Regulatory development

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 will phase in this buffer from 1 January 2016 to 1 January 2019.

Pillar 3 disclosures

The Pillar 3 Disclosures 2016 comprise all information required under Pillar 3, both quantitative and qualitative in accordance with Section 5.3.3 of the BoT's notification Re: Regulations on Capital Supervision for Commercial Banks.

The Pillar 3, market discipline, complements the minimum capital requirements and the supervisory review process.

Frequency

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

Media and location

The *Pillar 3 Disclosures 2016* on a standalone basis are available on our website: www.hsbc.co.th, whereas the Pillar 3 Disclosures 2016 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 2016* 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 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 internal ratings-based ('IRB') foundation 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 IRB advanced approach allows banks to use their own internal assessment in both determining PD and quantifying EAD and LGD.

For credit risk, with the BoT's approval, we have adopted the standardised approach.

Counterparty credit risk 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. Three approaches for calculating counterparty credit risk and determining exposure values are defined by Basel: standardised, mark-to-market and internal model method ('IMM'). These exposure values are used to determine capital requirements under one of the credit risk approaches; standardised, IRB foundation and IRB advanced.

Internally, we use the mark-to-market and IMM approaches for managing and monitoring our counterparty credit risk.

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

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 ('VaR') model is used for general market, foreign exchange and interest rate risk.

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

We have adopted the standardised approach in determining our operational risk capital requirements.

Capital

Approach and policy

Our approach to capital management is designed to ensure we meet current regulatory requirements and that we respect the payment priority of our capital providers. We aim to maintain a strong capital base, to support the risks inherent in our business and to meet 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 plc 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.

Composition of regulatory capital

The BoT has issued the notification to revise the components of regulatory capital effective from 1 January 2013. 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. The revised adjustments to regulatory capital are being phased in: starting at 20% on 1 January 2014 and increasing a further 20% each year in order to reach 100% on 1 January 2018. During the transition period, any residual amount not deducted from regulatory capital under the revised adjustments will continue to be subject to the former treatment.

As permitted by the BoT regulation, however, we have elected to accelerate this transition and to apply the revisions in full with effect from 1 January 2014.

At 31 December 2016, we have an allocated and registered capital fund with the BoT of Baht 20,100 million *(30 June 2016 and 31 December 2015 : Baht* 20,100 *million and Baht* 20,100 *million, respectively)*. The detail can be summarised as follows:

Table 1 : Capital Structure

	31 December 2016 THBm	30 June 2016 THBm	31 December 2015 THBm
Assets maintained under Section 32	**21,990**	**20,693**	**21,268**
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	10,136	17,723	14,470
Total	**30,236**	**37,823**	**34,570**
Capital Fund	**20,100**	**20,100**	**20,100**
Less Regulatory adjustment	-	-	-
Regulatory Capital	**20,100**	**20,100**	**20,100**
Regulatory Capital after deducting capital add-on from Single Lending Limit	**19,828**	**19,664**	**19,271**

Table 2 : Capital Adequacy

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

	31 December 2016 THBm	30 June 2016 THBm	31 December 2015 THBm
Performing claims			
Claims on sovereigns and central banks, and multilateral development banks (MDBs)	9	42	2
Claims on financial institutions, non-central government public sector entities (PSEs) treated as claims on financial institutions, and securities firms	1,171	1,357	1,366
Claims on corporates, non-central government public sector entities (PSEs) treated as claims on corporates	6,547	7,138	7,184
Claims on retail portfolios	14	15	14
Claims on housing loans	27	28	22
Other assets	21	23	22
Non-performing claims	293	7	96
Total minimum capital requirement for credit risk	**8,082**	**8,610**	**8,706**

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

	31 December 2016 THBm	30 June 2016 THBm	31 December 2015 THBm
Standardised approach - specific interest rate risk	4	13	16
Internal model approach	143	238	185
Total minimum capital requirement for market risk	**147**	**251**	**201**

Minimum capital requirement for operational risk

	31 December 2016 THBm	30 June 2016 THBm	31 December 2015 THBm
Standardised approach	900	966	895
Total minimum capital requirement for operational risk	**900**	**966**	**895**

Capital ratio

	31 December 2016 %	30 June 2016 %	31 December 2015 %
Total capital to risk-weighted assets	**18.7**	**18.6**	**17.4**
Total capital to risk-weighted assets after deducting capital add-on from Single Lending Limit	**18.4**	**18.2**	**16.7**

Risk exposure and assessment

Risk management framework and policies

Risk management framework

We use an enterprise-wide risk management framework across the organisation and across all risk types. It is underpinned by our risk culture and is reinforced by HSBC Values and our Global Standards programme.

The framework fosters continuous monitoring of the risk environment, and an integrated evaluation of risks and their interactions. It also ensures a consistent approach to monitoring, managing and mitigating the risks we accept and incur in our activities.

Risk culture

Risk culture is a term describing an institution's norms, attitudes and behaviours related to risk awareness, risk taking and risk management. Risk culture is critical as it permeates everything that we do; an effective risk culture is one that enables and rewards individuals and groups for taking the right risks in an informed manner.

A high standard of risk culture is a sound risk culture that "*consistently supports appropriate risk awareness, behaviours and judgements about risk-taking within a strong risk governance framework*" and "*bolsters effective risk management, promotes sound risk-taking, and ensures that emerging risks or risk-taking activities beyond the institution's risk appetite are recognised assessed, escalated and addressed in a timely manner*". Governance, risk appetite and remuneration, are key contributors to a sound risk culture.

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', 'effective communication and challenge', 'incentives' and 'competency'. The principles can be summarised as follows:

Tone from the Top

The board and senior management are the starting point for setting the financial institution's core values and expectations for the risk culture of the institution, and their behaviour must reflect the values being espoused.

Accountability

Relevant employees at all levels understand the core values of the institution and its approach to risk, are capable of performing their prescribed roles, and are aware that they are held accountable for their actions in relation to the institution's risk-taking behavior.

Effective communication and challenge

A sound risk culture promotes 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 promote an environment of open and constructive engagement.

Incentives

Performance and talent management encourage and reinforce maintenance of the financial institution's desired risk management behaviour.

Competency

The status, resources and empowerment of the risk function as well as the embedding of risk attitudes and behaviours to ensure actions align with the organisation's risk culture, even when taken outside of rules and policies.

Risk management responsibilities
Overall accountability for risk resides with the Board of Directors. The Board delegates decision making authority to senior management.

Under the Chief Executive Officer ('CEO'), the individual business heads are accountable for the risks associated with their respective business (as part of the First Line of Defence).

The Chief Risk Officer ('CRO') is accountable for the Enterprise Risk Management ('ERM') framework and infrastructure and for ensuring that appropriate oversight of all inherent risks associated with the Group's activities is in place (as part of the Second Line of Defence). Risk and control functions and risk committees play a key role in risk oversight by supporting the CRO.

Given the broad geographical spread and diverse nature of the Group's operations, responsibilities are devolved to local business heads and functional heads.

Every employee at HSBC is then responsible for the risks that are part of their day to day job. These responsibilities for risk management are defined in the line with the three lines of defence model which defines responsibilities by activity rather than by department/ function.

The model underpins our approach to risk management by clarifying responsibility, encouraging collaboration, and 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 and ensuring that the right controls and assessments are in pace to mitigate them.
- The second line of defence sets the policy and guidelines for managing specific risks areas, provides advice and guidance in relation to the risk, and challenges the first line of defence on effective risk management.
- The third line of defence is Internal Audit function, which provides independent and objective assurance of the adequacy of the design and operational effectiveness of the Group's risk management framework and control governance process.

Risk governance
Governance is the combination of processes and structures to inform, direct, manage, and monitor the activities of the organisation toward the achievement of its objectives. It is used to balance the interests, power and accountability of the many stakeholders and members.

ERM must be governed in an efficient and effective way, ensuring adequate monitoring and escalation of matters relating to one or more of the risk types and the interaction and balance between them.

The governance of ERM is owned by Global Risk and the principles of effective decision making discussed 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) do not have decision making authority but 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 risk ownership and risk management. Decision are not taken by committees, but by specific individuals, in line with the three lines of defence, to promote 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 individuals as part of their roles, and significant issues should be escalated through reporting lines to heads - both through the first and second line of defence.

Board governance structure:
Board governance committees provide the structure to ensure clear accountability for risk and support suitable controls, mitigation and management.

Global Risk function
We have a Global Risk function, headed by the Group Chief Risk Officer, which is responsible for the Group's risk management framework. This responsibility includes establishing global policy, monitoring risk profiles, and forward-looking risk identification and management. Global Risk is made up of sub-functions covering all risks to our operations. It is independent from the global businesses, including sales and trading functions, helping to ensure balance in risk/return decisions.

In Thailand, the Risk Management Meeting ('RMM') is chaired by CRO with membership made up of senior managers. The RMM is the Bank's senior designated risk management committee as defined by the HSBC Regional Office in Hong Kong which is responsible for setting risk appetite and approving definitive risk policies and controls.

The members of Risk Management Meeting are the Chief Risk Officer, Chief Financial Officer, Chief Operating Officer, Treasurer, Head of Global Banking and Head of Commercial Banking. The RMM is chaired by CRO and convened on a monthly basis.

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. Within HSBC, risk appetite is managed through a global risk appetite framework and articulated in a risk appetite statement ('RAS'), which is biannually approved by the Board on the advice of the Group Risk Committee ('GRC').

The Group's risk appetite informs our strategic and financial planning process, defining the desired forward-looking risk profile of the Group. It is also integrated within other risk management tools, such as the top and emerging risks report and stress testing, to ensure consistency in risk management.

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

Financial position
- Strong capital position, defined by regulatory and internal capital ratios.
- Liquidity and funding management.

Operating model
- Returns generated in line with risk taken.
- Sustainable and diversified earnings mix, delivering consistent returns.

Business practice
- Zero tolerance for knowingly engaging in any business, activity or association where foreseeable reputational risk or damage has not been considered and/or mitigated.
- No appetite for deliberately or knowingly causing detriment to consumers arising from our products and services or incurring a breach of the letter or spirit of regulatory requirements.
- No appetite for inappropriate market conduct by a member of staff or by any Group business.

Risk measurement and reporting systems

Our risk measurement and reporting systems are designed to help ensure that risks are comprehensively captured with all the attributes necessary to support well-founded decisions, that those attributes are accurately assessed and that information is delivered in a timely manner for those risks to be successfully managed and mitigated.

Risk measurement and reporting systems are also subject to a governance framework designed to ensure that their build and implementation are fit for purpose and functioning appropriately. Risk information systems development is a key responsibility of the Global Risk function, while the development and operation of risk rating and management systems and processes are ultimately subject to the oversight of the Board.

We continue to invest significant resources in IT systems and processes in order to maintain and improve our risk management capabilities. A number of key initiatives and projects to enhance consistent data aggregation, reporting and management, and work towards meeting our Basel Committee data obligations are in progress. Group policy promotes the deployment of preferred technology where practicable. Group standards govern the procurement and operation of systems used in the Group to process risk information within business lines and risk functions.

Risks managed by HSBC

The principal risks associated with our banking operation 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 certain other products such as guarantees and derivatives.	Credit risk is: • **measured** as the amount which could be lost if a customer or counterparty fails to make repayments. In the case of derivatives, the measurement of exposure takes into account the current mark-to-market value to the Bank of the contract and the expected potential change in that value over time caused by movements in market rates; • **monitored** within limits approved by individuals within a framework of delegated authorities; and • **managed** through a robust risk control framework which outlines clear and consistent policies, principles and guidance for risk managers.
Liquidity and funding risk		
Liquidity risk is the risk that we do not have sufficient financial resources to meet our obligations as they fall due or that we can only do so at excessive cost. Funding risk is the risk that funding considered to be sustainable, and therefore used to fund assets, is not sustainable over time.	Liquidity risk arises from mismatches in the timing of cash flows. Funding risk arises when illiquid asset positions cannot be funded at the expected terms and when required.	Liquidity and funding risk is: • **measured** using a range of metrics including liquidity coverage ratios and net stable funding ratios; • **monitored** against the liquidity and funding risk framework; and • **managed** on a stand-alone basis with no reliance on any Group entity.

<table>
<tr><th>Risks</th><th>Arising from</th><th>Measurement, monitoring and management of risk</th></tr>
<tr><td colspan="3">Market risk</td></tr>
<tr><td>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.</td><td>Exposure to market risk is separated into two portfolios:
• trading portfolios; and
• non-trading portfolios.</td><td>Market risk is:
• measured in terms of value at risk, which measures the potential losses on risk positions over a specified time horizon for a given level of confidence, and assessed using stress testing;
• monitored using VaR, 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 RMM and the risk management meeting in various global businesses.</td></tr>
<tr><td colspan="3">Operational risk</td></tr>
<tr><td>Operational 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.</td><td>Operational risk arises from day-to-day operations or external events, and is relevant to every aspect of our business.</td><td>Operational risk is:
• measured using the risk and control assessment process, which assesses the level of risk and effectiveness of controls;
• monitored using key indicators and other internal control activities; and
• managed primarily by global business and functional managers that identify and assess risks, implement controls to manage them and monitor the effectiveness of these controls using the operational risk management framework.</td></tr>
<tr><td colspan="3">Regulatory compliance risk</td></tr>
<tr><td>Regulatory Compliance risk is the risk that we fail to observe the letter and spirit of all relevant laws, codes, rules, regulations and standards of good market practice, and incur fines and penalties and suffer damage to our business as a consequence.</td><td>Regulatory compliance risk is part of operational risk, and arises from the risk associated with breaching our duty to clients and, other counter-parties, inappropriate market conduct and breaching other regulatory requirements.</td><td>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 our regulatory compliance risk assessments 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.</td></tr>
<tr><td colspan="3">Financial crime risk</td></tr>
<tr><td>Financial crime risk is the risk that we knowingly or unknowingly help parties to commit or to further potentially illegal activity through HSBC.</td><td>Financial crime risk is part of operational risk and arises from day-to-day banking operations.</td><td>Financial crime 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 compliance risk appetite statement 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.</td></tr>
</table>

Risks	Arising from	Measurement, monitoring and management of risk
Reputational risk		
Reputational risk is the risk of failure to meet stakeholder expectations as a result of any event, behaviour, action or inaction, either by the Bank itself, our employees or those with whom we are associated, that might cause stakeholders to form a negative view of HSBC.	Primary reputational risks arise directly from an action or inaction by the Bank, its employees or associated parties that are not the consequence of another type of risk. Secondary reputational risks are those arising indirectly and are a result of a failure to control any other risks.	Reputational risk is: • **measured** by reference to our reputation as indicated by our dealings with all relevant stakeholders, including media, regulators, customers and employees; • **monitored** through a reputational risk management framework; and • **managed** by every member of staff, and covered by a number of policies and guidelines.

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 Internal Capital Adequacy Assessment Process ('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 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

Our exposure to credit risk arises from a wide range of customer and product types, and the risk rating systems in place to measure and monitor these risks are correspondingly diverse. Senior management receives a variety of reports on our credit risk exposures including loan impairments, total exposures and RWAs, as well as updates on specific portfolios that are considered to have heightened credit risk.

Credit risk exposures are generally measured and managed in portfolios of either customer types or product categories. Risk rating systems are designed to assess the default propensity of, and loss severity associated with, distinct customers who are typically managed as individual relationships or, on a product portfolio basis.

Rating systems for individually managed relationships typically use customer financial statements and market data analysis, but also qualitative elements and a final subjective overlay to better reflect any idiosyncratic elements of the customer’s risk profile.

We use the Standardised Approach to calculate capital requirement for credit risks. Non-performing claims represent classified assets/loans 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 based on collective impairment for which historical loss rate experience, time value and economic factors have been taken into account.

The following tables set out credit risk exposure value according to regulatory requirement at 31 December 2016 and 2015.

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 2016 and 2015

	31 December 2016		31 December 2015	
	Average exposure value THBm	Exposure value THBm	Average exposure value THBm	Exposure value THBm
On-balance sheet				
Loans and advances, net	112,038	98,078	109,101	114,885
Investments in debt securities, net	83,123	84,709	81,199	89,339
Deposits (including accrued interest receivable)	2,886	3,188	2,245	3,246
Derivative assets	43,309	37,713	47,253	47,541
Total	**241,356**	**223,688**	**239,798**	**255,011**
Off-balance sheet				
Aval, guarantees and letter of credit	38,433	37,984	39,274	38,192
OTC derivatives	2,637,492	2,492,023	2,776,940	2,723,337
Undrawn commitment	94,110	83,509	89,497	97,155
Total	**2,770,035**	**2,613,516**	**2,905,711**	**2,858,684**

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 2016 and 2015

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

31 December 2016

	On-balance sheet					**Off-balance sheet**			
Country or geographical area	**Total THBm**	**Loans and advances THBm**	**Investments in debt securities THBm**	**Deposits THBm**	**Derivative assets THBm**	**Total THBm**	**Aval, guarantees and letter of credit THBm**	**OTC derivatives THBm**	**Undrawn commitment THBm**
Thailand	200,099	95,050	84,709	2,739	17,601	1,115,518	20,353	1,016,506	78,659
Asia Pacific (excluding Thailand)	13,469	-	-	4	13,465	1,083,055	4,336	1,078,325	394
North America and Latin America	3,817	-	-	422	3,395	231,860	8,009	219,551	4,300
Africa and Middle East	2,121	2,121	-	-	-	-	-	-	-
Europe	4,182	907	-	23	3,252	183,083	5,286	177,641	156
Total	**223,688**	**98,078**	**84,709**	**3,188**	**37,713**	**2,613,516**	**37,984**	**2,492,023**	**83,509**

31 December 2015

	On-balance sheet					**Off-balance sheet**			
Country or geographical area	**Total THBm**	**Loans and advances THBm**	**Investments in debt securities THBm**	**Deposits THBm**	**Derivative assets THBm**	**Total THBm**	**Aval, guarantees and letter of credit THBm**	**OTC derivatives THBm**	**Undrawn commitment THBm**
Thailand	224,747	110,635	89,339	3,158	21,615	1,094,994	20,783	980,694	93,517
Asia Pacific (excluding Thailand)	18,202	786	-	12	17,404	1,327,635	4,227	1,323,017	391
North America and Latin America	4,661	-	-	46	4,615	239,679	7,036	229,529	3,114
Africa and Middle East	2,522	2,522	-	-	-	-	-	-	-
Europe	4,879	942	-	30	3,907	196,376	6,146	190,097	133
Total	**255,011**	**114,885**	**89,339**	**3,246**	**47,541**	**2,858,684**	**38,192**	**2,723,337**	**97,155**

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 2016 and 2015

	31 December 2016			**31 December 2015**		
	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	72,295	25,783	98,078	85,556	29,329	114,885
Investments in debt securities, net	58,303	26,406	84,709	59,494	29,845	89,339
Deposits (including accrued interest receivable)	3,188	-	3,188	3,246	-	3,246
Derivative assets	10,282	27,431	37,713	11,532	36,009	47,541
Total	**144,068**	**79,620**	**223,688**	**159,828**	**95,183**	**255,011**
Off-balance sheet						
Aval, guarantees and letter of credit	35,655	2,329	37,984	37,775	417	38,192
OTC derivatives	1,058,331	1,433,692	2,492,023	981,844	1,741,493	2,723,337
Undrawn commitment	79,846	3,663	83,509	92,342	4,813	97,155
Total	**1,173,832**	**1,439,684**	**2,613,516**	**1,111,961**	**1,746,723**	**2,858,684**

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 2016 and 2015

31 December 2016

Country or geographic area	Loans including accrued interest receivable			Investments in debt securities classified as doubtful loss
	Normal THBm	**Doubtful loss THBm**	**Total THBm**	**THBm**
Thailand	95,892	218	96,110	410
Africa and Middle East	2,143	-	2,143	-
Europe	915	-	915	-
Total	**98,950**	**218**	**99,168**	**410**

31 December 2015

Country or geographic area	Loans including accrued interest receivable					Investments in debt securities classified as doubtful loss
	Normal THBm	**Special mentioned THBm**	**Substandard THBm**	**Doubtful loss THBm**	**Total THBm**	**THBm**
Thailand	111,058	391	15	228	111,692	5
Asia Pacific (excluding Thailand)	794	-	-	-	794	-
Africa and Middle East	2,548	-	-	-	2,548	-
Europe	951	-	-	-	951	-
Total	**115,351**	**391**	**15**	**228**	**115,985**	**5**

Remark:

- *Loans represent loans to customers, interbank and money market, including accrued interest receivable and net of deferred revenue.*
- *Investments in debt securities for 2016 and 2015 classified as doubtful loss represent unrealised losses on revaluation according to the definition of BoT notifications No. 5/2559 dated 10 June 2016 and No. 31/2551 dated 3 August 2008 Re: Classification and Provision of the Financial Institutions, respectively.*
- *The classification of assets for 2016 and 2015 shown above is in accordance with BoT notifications No. 5/2559 dated 10 June 2016 and No. 31/2551 dated 3 August 2008 Re: Classification and Provision of the Financial Institutions, respectively.*

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 2016 and 2015

	31 December 2016			
	Loans including accrued interest receivable			**Specific provision for investments in debt securities THBm**
Country or geographic area	**General provision THBm**	**Specific provision THBm**	**Bad debt written-off during the year THBm**	
Thailand		162	-	410
Africa and Middle East		-	-	-
Europe		-	-	-
Total	**928**	**162**	**-**	**410**

	31 December 2015			
	Loans including accrued interest receivable			**Specific provision for investments in debt securities THBm**
Country or geographic area	**General provision THBm**	**Specific provision THBm**	**Bad debt written-off during the year THBm**	
Thailand		207	120	5
Asia Pacific (excluding Thailand)		-	-	-
Africa and Middle East		-	-	-
Europe		-	-	-
Total	**893**	**207**	**120**	**5**

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 2016 and 2015

Type of business	31 December 2016		
	Pass THBm	**Doubtful loss THBm**	**Total THBm**
Agriculture and mining	1,444	-	1,444
Financial sector	47,273	-	47,273
Manufacturing and commerce	40,920	218	41,138
Real estate business and construction	1,811	-	1,811
Public utilities and services	6,989	-	6,989
Housing loan	347	-	347
Others	166	-	166
Total	**98,950**	**218**	**99,168**

Type of business	31 December 2015				
	Pass THBm	**Special mention THBm**	**Substandard THBm**	**Doubtful of loss THBm**	**Total THBm**
Agriculture and mining	2,495	355	-	-	2,850
Financial sector	56,270	-	-	-	56,270
Manufacturing and commerce	47,714	12	-	228	47,954
Real estate business and construction	2,909	-	15	-	2,924
Public utilities and services	5,503	23	-	-	5,526
Housing loan	295	-	-	-	295
Others	166	-	-	-	166
Total	**115,352**	**390**	**15**	**228**	**115,985**

Remark: The classification of assets for 2016 and 2015 shown above is in accordance with BoT notifications No. 5/2559 dated 10 June 2016 and No. 31/2551 dated 3 August 2008 Re: Classification and Provision of the Financial Institutions, respectively.

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 2016 and 2015

	31 December 2016		
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		162	-
Real estate business and construction		-	-
Public utilities and services		-	-
Housing loan		-	-
Others		-	-
Total	**928**	**162**	**-**

	31 December 2015		
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		207	120
Real estate business and construction		-	-
Public utilities and services		-	-
Housing loan		-	-
Others		-	-
Total	**893**	**207**	**120**

Table 10 : Reconciliation of the movement in the general provision and specific provision against loans including accrued interest receivable at 31 December 2016 and 2015

	31 December 2016		
	General provision THBm	**Specific provision THBm**	**Total THBm**
Provisions at the beginning of year	893	207	1,100
Bad debts recovery during the year	-	(1)	(1)
Provisions charge (reversal) during the year	35	(44)	(9)
Provisions at the end of year	**928**	**162**	**1,090**

	31 December 2015		
	General provision THBm	**Specific provision THBm**	**Total THBm**
Provisions at the beginning of year	707	350	1,057
Bad debts written-off during the year	-	(120)	(120)
Provisions charge (reversal) during the year	186	(23)	163
Provisions at the end of year	**893**	**207**	**1,100**

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 2016 and 2015

	31 December 2016		
	On-balance sheet THBm	Off-balance sheet THBm	Total THBm
Performing claims			
Claims on sovereigns and central banks, and MDBs	61,069	2,687	63,756
Claims on financial institutions, PSEs treated as claims on financial institutions, and securities firms	7,142	76,418	83,560
Claims on corporate, PSEs treated as claims on corporate	65,816	24,389	90,205
Claims on retail portfolios	166	-	166
Claims on housing loans	347	-	347
Other assets	38,164	-	38,164
Non-performing claims	56	2,311	2,367
Total	**172,760**	**105,805**	**278,565**

	31 December 2015		
	On-balance sheet THBm	Off-balance sheet THBm	Total THBm
Performing claims			
Claims on sovereigns and central banks, and MDBs	68,614	6,067	74,681
Claims on financial institutions, PSEs treated as claims on financial institutions, and securities firms	4,075	80,035	84,110
Claims on corporate, PSEs treated as claims on corporate	71,578	26,414	97,992
Claims on retail portfolios	166	-	166
Claims on housing loans	295	-	295
Other assets	47,884	-	47,884
Non-performing claims	36	789	825
Total	**192,648**	**113,305**	**305,953**

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

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 the customer records in the 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.

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 2016 and 2015

	31 December 2016										
	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	96,459	-	102	-	-			-			-
Claims on financial institutions, PSEs treated as claims on financial institutions, and securities firms	-	28,335	2,441	6,890	-						-
Claims on corporate, PSEs treated as claims on corporate	-	2,326	963	7,096	-						71,720
Claims on retail portfolios										-	166
Claims on housing loans									57		290
Other assets						52,381	52				238
Risk weight			**50%**	**100%**	**150%**					**75%**	
Non-performing claims			-	56	2,311					-	

31 December 2015

	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	110,391	-	57	-	-			-			-
Claims on financial institutions, PSEs treated as claims on financial institutions, and securities firms	-	37,220	1,960	7,647	-						-
Claims on corporate, PSEs treated as claims on corporate	-	889	3,389	8,328	-						76,590
Claims on retail portfolios										-	166
Claims on housing loans									60	-	235
Other assets						50,771	53				245
Risk weight			**50%**	**100%**	**150%**					**75%**	
Non-performing claims			-	21	804					-	

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.

Our general policy is to 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.

The most common method of mitigating credit risk is to take collateral. In our commercial real estate businesses, a mortgage over the property is usually taken to help secure claims. In the commercial and industrial sectors, charges are created over business assets such as premises, stock and debtors. Facilities to Small and Medium Enterprises are commonly granted against guarantees given by their owners and/or directors.

In the institutional sector, trading facilities are supported by charges over financial instruments such as cash, debt securities and equities. 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, reverse repos, securities lending and borrowing. Netting is used extensively and is a prominent feature of market standard documentation.

Our Global Banking and Markets business utilises credit risk mitigation to manage the credit risk of its portfolios, with the goal of reducing concentrations in individual names, sectors or portfolios. The techniques in use include credit default swaps ('CDS') purchases, structured credit notes and securitisation structures. Buying credit protection creates credit exposure against the protection provider, which is monitored as part of the overall credit exposure to them.

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.

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. Residential property collateral values are determined through a combination of professional appraisals, market indices or statistical analysis.

For banking book exposures subject to the standardised approach – covered by 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 applicable to the credit quality step associated with the protection provider. The uncovered portion attracts the risk weight associated with the credit quality step 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 associated with the credit quality step of the obligor.

Collateral arrangements

It is our policy to revalue all traded transactions and associated collateral positions on a daily basis. An independent Collateral Management function manages the collateral process including pledging and receiving collateral, investigating disputes and non-receipts.

Eligible collateral types are controlled under a policy to ensure price transparency, price stability, liquidity, enforceability, independence, reusability and eligibility for regulatory purposes. A valuation 'haircut' policy reflects the fact that collateral may fall in value between the date the collateral was called and the date of liquidation or enforcement.

Table 13 : Exposure value under the Standardised Approach covered by collateral classified by type of assets and collateral at 31 December 2016 and 2015

	31 December 2016		31 December 2015	
	Eligible financial collateral THBm	Guarantee and credit derivatives THBm	Eligible financial collateral THBm	Guarantee and credit derivatives THBm
Performing claims				
Claims on sovereigns and central banks, and MDBs	2,556	-	6,000	-
Claims on financial institutions, PSEs treated as claims on financial institutions, and securities firms	47,046	4,009	43,060	-
Claims on corporate, PSEs treated as claims on corporate	2,939	10,492	3,020	10,333
Non-performing claims	1	57	1	72
Total	**52,542**	**14,558**	**52,081**	**10,405**

Market risk

Overview and objective

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 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 available-for-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 GMB. 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 equity prices, 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 a principal factor in determining the level of limits.

Value at risk

VaR is a technique for estimating potential losses on risk positions as a result of movements in market rates and prices over a specified time horizon and to a given level of confidence. The use of VaR is integrated into market risk management and calculated for all trading positions regardless of how we capitalise them. Where there is not an approved internal model, we use the appropriate local rules to capitalise exposures. In addition, we calculate VaR for non-trading portfolios to have a complete picture of risk. Where we do not calculate VaR explicitly, we use alternative tools as summarised in the ‘Stress testing’ section below.

Our models are predominantly based on historical simulation which 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; and
- VaR measures are calculated to a 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 extreme ones;
- the use of a holding period assumes that all positions can be liquidated or the risks offset during that period, which 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 does not take into account losses that might occur beyond this level of confidence; and
- VaR is calculated on the basis of exposures outstanding at the close of business and therefore does not necessarily reflect intra-day exposures.

Market Product Control 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 also 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 of more extreme, although plausible, events or movements in a set of financial variables. In such scenarios, losses can be much greater than those predicted by VaR modelling.

Stress testing is implemented at legal entity, 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 potential events or market movements at each level. The risk appetite around potential stress losses for the Group is set and monitored against referral limits.

Market risk reverse stress tests are undertaken on the premise that there is a fixed loss. The stress testing process identifies which scenarios lead to this loss. The rationale behind the reverse stress test is to understand scenarios that are beyond normal business settings and could have contagion and systemic implications.

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 against the corresponding VaR numbers. 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 only Hypothetical loss, are counted towards the multiplier determined by the BoT for the purposes of the capital requirement calculation for market risk. The multiplier capital add-on does not get increased if there are less than five loss exceptions 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 limit 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 which 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 as a result of 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.

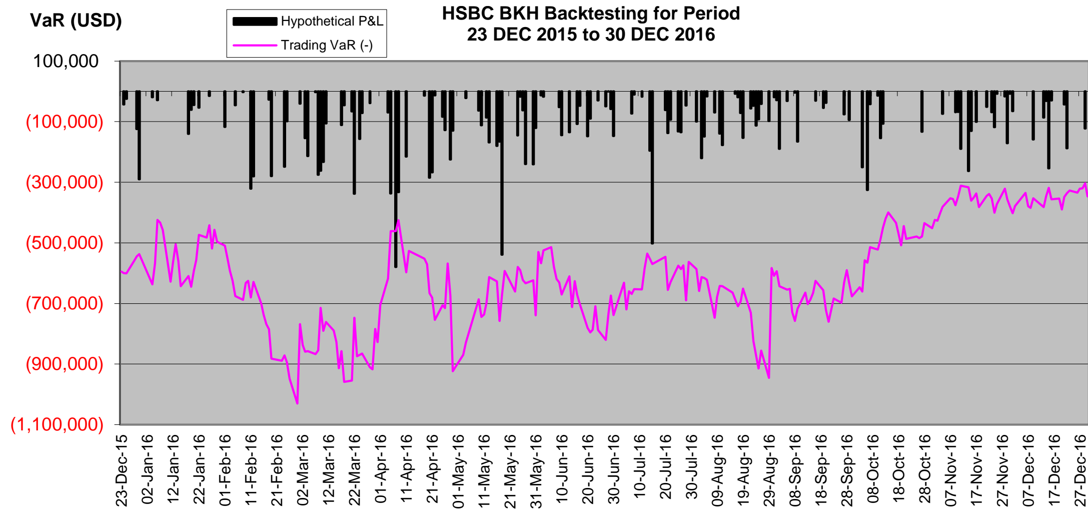
Specific issuer risk
Specific issuer (credit spread) risk arises from a change in the value of debt instruments due to a perceived change in the credit quality of the issuer or underlying assets. As well as through VaR and stress testing, we manage the exposure to credit spread movements within the trading portfolios through the use of 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 2016, 30 June 2016 and 31 December 2015

	31 December 2016 THBm	30 June 2016 THBm	31 December 2015 THBm
Interest Rate Risk			
Maximum VaR during the period	68	103	92
Average VaR during the period	45	74	58
Minimum VaR during the period	36	47	37
VaR at the end of the period	39	84	63
Foreign Exchange Rate Risk			
Maximum VaR during the period	21	18	33
Average VaR during the period	7	7	6
Minimum VaR during the period	1	1	1
VaR at the end of the period	1	5	1
Total Market Risk			
Maximum VaR during the period	64	103	93
Average VaR during the period	45	75	58
Minimum VaR during the period	34	47	37
VaR at the end of the period	39	82	61

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 is a back-testing exception for the period 23 December 2015 to 30 December 2016.

Interest rate risk in the banking book

Interest rate risk in the banking book or non-trading portfolios arises principally from mismatches between the future yield on assets and their funding cost, as a result of interest rate changes. The prospective change in future net interest income from non-trading portfolios will be reflected in the current realisable value of these positions, should they be sold or closed prior to maturity.

In order to manage this risk optimally, market risk in non-trading portfolios is transferred to Balance Sheet Management ('BSM') or to separate books managed under the supervision of the local ALCO.

The transfer of market risk to books managed by BSM or supervised by ALCO is usually achieved by a series of internal deals between the business units and these books. When the behavioural characteristics of a product differ from its contractual characteristics, the behavioural characteristics are assessed to determine the true underlying interest rate risk. Behavioural assumptions of a product are assessed with respect to each local market in which the product is offered. Local ALCO are required to regularly monitor all such behavioural assumptions and interest rate risk positions to ensure they comply with interest rate risk limits established by Risk Management Meeting ('RMM').

We aim, through our management of interest rate risk in the banking book, to mitigate the effect of prospective interest rate movements which could reduce future net interest income, while balancing the cost of such hedging activities on the current net revenue stream.

Interest rate risk arising within the trading portfolios and non-trading portfolios is measured, where practical, on a daily basis. HSBC uses a range of tools to monitor and limit interest rate risk exposures. These include the present value of a basis point movement in interest rates, VaR, stress testing and sensitivity analysis.

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 2016 and 2015

	Effect to net income	
	2016	**2015**
Currency	**THBm**	**THBm**
Baht	19	54
US Dollar	(72)	(175)
Others	10	3
Total effect of changes in interest rates to net interest income	**(43)**	**(118)**
Percentage of net effect to net future interest income	**(0.6%)**	**(1.6%)**

Equity exposures in the banking book

At 31 December 2016 and 2015, there is no equity investments.

Details of the Bank's accounting policy for investments may be found on page 13, of the *Annual financial statements 2016*.

Operational risk

Overview and objective

Operational 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.

Operational risk is relevant to every aspect of our business. It covers a wide spectrum of issues, in particular legal, compliance, security and fraud. 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 operational 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 operational risk lies with HSBC's staff.

HSBC's Operational Risk Management Framework ('ORMF') is our overarching approach to managing operational risk, the purpose of which is to:

- identify and manage our operational risks in an effective manner;
- remain within the Group's operational risk appetite, which helps the organisation understand the level of risk it is willing to accept; and
- drive forward-looking risk awareness and assist management focus during 2016.

Activity to strengthen our risk culture and better embed the use of the ORMF was further implemented in 2016. In particular, the use of the three lines of defence model.

The First Line of Defence owns the risk and is responsible for identifying, recording, reporting, managing the risks and ensuring that the right controls and assessments are in place to mitigate these risks. The Second Line of Defence sets the policy and guidelines for managing the risks and provides advice, guidance and challenge to the First Line of Defence on effective risk management.

The Third Line of Defence is Internal Audit which independently ensures we are managing risk 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 operational risk and give guidance on mitigating actions to be taken when weaknesses are identified.

Business managers are responsible for maintaining an acceptable 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.

Operational risk and control assessment approach

Operational 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 operational risks, an assessment of the effectiveness of controls, and a tracking mechanism for action plans so that they can proactively manage operational 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 centralised database to record the results of our operational risk management process. Operational risk and control assessments are input and maintained by business units. Business management and Business Risk and Control Managers monitor and follow up the progress of documented action plans.

Operational risk loss reporting

To ensure that operational risk losses are consistently reported and monitored at Group level, all Group companies are required to report individual losses when the net loss is expected to exceed US$10,000 and to aggregate all other operational risk losses under US$10,000. Losses are entered into the Operational Risk IT system and are reported to the Governance on a monthly basis.

Abbreviations

Abbreviation	Brief description
A	
ALCO	Asset and Liability Management Committee
B	
Bank	The Hongkong and Shanghai Banking Corporation Limited, Bangkok Branch
Basel Committee	The Basel Committee on Banking Supervision
BoT	The Bank of Thailand
BSM	Balance Sheet Management
C	
CCB	Capital Conservation Buffer
CCF	Credit Conversion Factor
CDS	Credit Default Swap
CEO	Chief Executive Officer
CRO	Chief Risk Officer
E	
EAD	Exposure at Default
ECAI	External Credit Assessment Institutions
ERM	Enterprise Risk Management
G	
GB&M	Global Banking and Markets, a global business
GMB	Group Management Board
GRC	Group Risk Committee
Group	HSBC Holdings together with its subsidiary undertakings
H	
HSBC	HSBC Holdings together with its subsidiary undertakings
I	
ICAAP	Internal Capital Adequacy Assessment Process
IMM	Internal Model Method
IRB	Internal Ratings-Based Approach
L	
LGD	Loss Given Default
M	
MDB	Multilateral Development Bank
O	
ORMF	Operational Risk Management Framework
OTC	Over-the-Counter
P	
PD	Probability of Default
PSE	Public Sector Entities
R	
RMM	Risk Management Meeting
RWA	Risk-Weighted Asset
S	
SA	Standardised Approach
SFT	Securities Financing Transactions
SPE	Special Purpose Entity
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 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.
Commercial real estate	Any real estate, comprising buildings or land, intended to generate a profit, either from capital gain or rental income.
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 default swap ('CDS')	A derivative contract whereby a buyer pays a fee to a seller in return for receiving a payment in the event of a defined credit event (e.g. bankruptcy, payment default on a reference asset or assets, or downgrades by a rating agency) on an underlying obligation (which may or may not be held by the buyer).
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	Risk of financial loss if a customer or counterparty fails to meet an obligation under a contract. It arises mainly from direct lending and trade finance business but also from products such as guarantees, derivatives and debt securities.

Term	Definition
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.
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.
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.

Term	Definition
L	
Legal risk	The risk of financial loss, sanction and/or reputational damage resulting from contractual risk (the risk that the rights and/or obligations of a Group member within a contractual relationship are defective); dispute risk (the risk due to an adverse dispute environment or the management of potential or actual disputes); legislative risk (the risk that a Group member fails to adhere to laws of the jurisdiction in which it operates); and non-contractual rights risk (the risk that a Group member's assets are not properly owned or are infringed by others or the infringement by a Group member of another party's rights).
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.
Minimum capital requirement	The minimum amount of regulatory capital that a financial institution must hold to meet the Pillar 1 requirements for credit, market and operational risk. The Pillar 1 capital charge calculated at 8.5% of RWAs.
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	
Pillar 1	Minimum capital requirements - the calculation of regulatory capital for credit, market, and operational risk.
Pillar 2	The supervisory review process - sets out the process by which a bank should review its overall capital adequacy and the processes under which the supervisors evaluate how well financial institutions are assessing their risks and take appropriate actions in response to the assessments.
Pillar 3	Market discipline - sets out the disclosure requirements for banks to publish certain details of their risks, capital and risk management, with the aim of strengthening market discipline.
Probability of default ('PD')	The probability that an obligor will default within one year.

Term	Definition
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.
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	
Securities financing transactions ('SFT')	A repurchase or reverse repurchase transaction, a securities or commodities lending or borrowing transaction, or a margin lending transaction.
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.
Special Purpose Entity ('SPE')	A corporation, trust or other non-bank entity established for a narrowly defined purpose, including for carrying on securitisation activities. The structure of the SPE and its activities are intended to isolate its obligations from those of the originator and the holders of the beneficial interests in the securitisation.
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.
Stressed VaR	A market risk measure based on potential market movements for a continuous one-year period of stress for a trading portfolio.
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.