恒生銀行
HANG SENG BANK

Banking Disclosure Statement

31 December 2018

(Unaudited)

These disclosures are prepared under the Banking (Disclosure) Rules

BANKING DISCLOSURE STATEMENT *(unaudited)*

Contents

Tables

Introduction

Purpose

The information contained in this document is for Hang Seng Bank Limited ("the Bank") and its subsidiaries (together "the Group"). It should be read in conjunction with the Group's 2018 Annual Report. The Group's Annual Report and the Banking Disclosure Statement, taken together, comply with the Banking (Disclosure) Rules ("BDR") made under section 60A of the Banking Ordinance.

These banking disclosures are governed by the Group's disclosure policy, which has been approved by the Board. The disclosure policy sets out the governance, control and assurance requirements for publication of the document. While the Banking Disclosure Statement is not required to be externally audited, the document has been subject to independent review in accordance with the Group's policies on disclosure and its financial reporting and governance processes.

Basis of preparation

Except where indicated otherwise, the financial information contained in this Banking Disclosure Statement has been prepared on a consolidated basis. The basis of consolidation for regulatory purposes is different from that for accounting purposes. Information regarding subsidiaries that are not included in the consolidation for regulatory purposes is set out in the "Basis of consolidation" section in this document.

The information in this document is not audited and does not constitute statutory accounts.

Certain financial information in this document is extracted from the statutory accounts for the year ended 31 December 2018 which will be delivered to the Registrar of Companies and the Hong Kong Monetary Authority ("HKMA"). The Auditors expressed an unqualified opinion on those statutory accounts in their report dated 19 February 2019. The Auditor's Report did not include a reference to any matters to which the auditor drew any attention by way of emphasis without qualifying their report; and did not contain a statement under sections 406(2), 407(2) or (3) of the Hong Kong Companies Ordinance (Cap.622). The Group's 2018 Annual Report, which include the statutory accounts, can be viewed on our website, www.hangseng.com.

The Banking Disclosure Statement

The HKMA has implemented the Basel Committee on Banking Supervision ("BCBS") standards on revised Pillar 3 disclosures requirements released in January 2015 ("January 2015 standard") since 2017. In June 2018, the HKMA further amended the BDR to incorporate the BCBS Pillar 3 disclosures requirements – consolidated and enhanced framework finalised in March 2017 ("March 2017 standard"). The Group has implemented the relevant updates and new requirements in accordance with the latest BDR.

According to the BDR, disclosure of comparative information is not required unless otherwise specified in the standard disclosure templates. Prior period disclosures can be found in the Regulatory Disclosures section of our website, www.hangseng.com.

The Banking Disclosure Statement includes the majority of the information required under the BDR. The remainder of the disclosure requirements are covered in the Group's 2018 Annual Report which can be found in the Investor Relations – Financial Statements section of our website, www.hangseng.com.

Disclosure requirements covered in the Group's 2018 Annual Report:

– Section 16FJ - LIQA : Liquidity risk management on pages 69 to 73
– Section 16J - The Group's definition of "Impaired" and "Renegotiated" and the methods adopted for determining impairments in note 2(j) on pages 163 to 169
– Sections 16ZS, 16ZT, 16ZU, 16ZV - Remuneration on pages 113, 116 to 117
– Section 44 - Assets used as security in note 30 on page 200
– Section 46 - The general disclosure of the major business activities and product lines in note 5 on page 181 and note 21 on pages 188 to 191 respectively
– Section 52 - Corporate governance on pages 104 to 127

Table 1: KM1 – Key prudential ratios

			a	b	c	d	e
			At[1]				
		Footnotes	**31 Dec 2018**	30 Sep 2018	30 Jun 2018	31 Mar 2018	31 Dec 2017
	Regulatory capital (HK$m)	*2*					
1	Common Equity Tier 1 ("CET1")		**101,724**	100,320	97,542	95,632	94,458
2	Tier 1		**108,705**	107,301	104,523	102,613	101,439
3	Total capital		**123,307**	121,299	118,100	116,016	115,247
	Risk-weighted asset ("RWA") (HK$m)	*2*					
4	Total RWA		**611,885**	602,711	601,549	600,727	572,723
	Risk-based regulatory capital ratios (as a percentage of RWA)	*2*					
5	CET1 ratio (%)		**16.6**	16.6	16.2	15.9	16.5
6	Tier 1 ratio (%)		**17.8**	17.8	17.4	17.1	17.7
7	Total capital ratio (%)		**20.2**	20.1	19.6	19.3	20.1
	Additional CET1 buffer requirements (as a percentage of RWA)	*2*					
8	Capital conservation buffer requirement (%)		**1.875**	1.875	1.875	1.875	1.250
9	Countercyclical capital buffer requirement (%)		**1.550**	1.661	1.651	1.626	1.085
10	Higher loss absorbency requirements (%) (applicable only to Global systemically important authorised institutions ("G-SIBs") or Domestic systemically important authorised institutions ("D-SIBs"))		**1.125**	1.125	1.125	1.125	0.750
11	Total AI-specific CET1 buffer requirements (%)		**4.550**	4.661	4.651	4.626	3.085
12	CET1 available after meeting the AI's minimum capital requirements (%)		**11.8**	11.8	11.4	11.1	11.7
	Basel III leverage ratio	*3*					
13	Total leverage ratio ("LR") exposure measure (HK$m)		**1,477,001**	1,418,636	1,444,966	1,415,190	1,388,288
14	LR (%)		**7.4**	7.6	7.2	7.3	7.3
	Liquidity Coverage Ratio ("LCR")	*4*					
	Total high quality liquid assets ("HQLA") (HK$m)		**293,081**	280,177	274,966	279,172	277,788
16	Total net cash outflows (HK$m)		**140,330**	135,029	131,540	135,437	133,131
17	LCR (%)		**209.1**	208.2	209.6	207.0	209.5
	Net Stable Funding Ratio ("NSFR")	*5*					
18	Total available stable funding (HK$m)		**1,076,646**	1,038,035	1,058,496	1,025,318	N/A
19	Total required stable funding (HK$m)		**699,089**	689,787	689,335	670,407	N/A
20	NSFR (%)		**154.0**	150.5	153.6	152.9	N/A

1 *All figures reported in 2018 are under the new Hong Kong Financial Reporting Standard 9 ("HKFRS 9"). Prior to 2018, the figures presented are reported under the Hong Kong Accounting Standard 39 ("HKAS 39").*

2 *The regulatory capital, RWA, risk-based regulatory capital ratios and additional CET1 buffer requirements above are based on or derived from the information as contained in the "Capital Adequacy Ratio" return submitted to the HKMA on a consolidated basis under the requirements of section 3C(1) of the Banking (Capital) Rules ("BCR").*

3 *From 1 January 2018 onwards, the Basel III leverage ratio disclosures are made in accordance with the information contained in the "Leverage Ratio" return submitted to the HKMA under the requirements specified in Part 1C of the BCR. Prior to 2018, the leverage ratio disclosures are made in accordance with the "Quarterly Template on Leverage Ratio" submitted to the HKMA during the parallel run period.*

4 *The LCR shown are the simple average values of all working days in the reporting periods and are made in accordance with the requirements specified in the "Liquidity Position" return submitted to the HKMA under rule 11(1) of the Banking (Liquidity) Rules ("BLR").*

5 *The NSFR disclosures are made in accordance with the information contained in the "Stable Funding Position" return submitted to the HKMA under the requirements specified in rule 11(1) of the BLR. The requirements have been implemented with effect from 2018 reporting periods. Accordingly, the ratio at 31 December 2017 is not shown.*

Overview of Risk Management

Our 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 promotes risk awareness and sound operational and strategic decision making. It also ensures we have a consistent approach to monitoring, managing and mitigating the risks we accept and incur in our activities. Further information on our risk management framework is set out on page 40 of the Group's 2018 Annual Report. The measurement and management of principal risks facing the Group is described on pages 42 to 45 of the Group's 2018 Annual Report.

Risk culture

We have long recognised the importance of a strong risk culture, the fostering of which is a key responsibility of senior executives. Our risk culture is reinforced by HSBC Values and our Global Standards programme. It is instrumental in aligning the behaviours of individuals with our attitude to assuming and managing risk, which helps to ensure that our risk profile remains in line with our risk appetite.

Our risk culture is further reinforced by our approach to remuneration. Individual awards, including those for senior executives, are based on compliance with HSBC Values and the achievement of financial and non-financial objectives that are aligned to our risk appetite and strategy.

Risk governance

The Board has ultimate responsibility for the effective management of risk and approves the risk appetite. It is advised by the Risk Committee on risk appetite and its alignment with strategy, risk governance and internal controls, and high-level risk related matters.

Executive accountability for the ongoing monitoring, assessment and management of the risk environment and the effectiveness of the risk management framework resides with the Group's Chief Risk Officer, supported by the Risk Management Meeting ("RMM").

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

Our executive risk governance structures ensure appropriate oversight and accountability for risk, which facilitates the reporting and escalation to the RMM.

Risk appetite

Risk appetite is a key component of our management of risk. It sets out the aggregate level and types of risk that we are willing to accept in achieving our medium to long-term strategic goals. Within the Group, risk appetite is managed through a global risk appetite framework and articulated in a Risk Appetite Statement ("RAS"), which is approved by the Board on the advice of the Group's Risk Committee.

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

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. Information on our risk management tools is set out on page 41 of the Group's 2018 Annual Report. Details on the Group's overarching risk appetite are set out on in the global risk appetite framework.

Stress testing

The Group operates a comprehensive stress testing programme that supports our risk management and capital planning. It includes execution of stress tests mandated by our regulators, as well as internal stress tests. Our stress testing is supported by dedicated teams and infrastructure.

Our testing programme assesses our capital strength through a rigorous examination of our resilience to external shocks. It also helps us understand and mitigate risks, and informs our decision about capital levels. Stress testing results are reported, where appropriate, to the RMM and the Group's Risk Committee.

The Group's risk functions

The Group's Risk function, headed by the Group's Chief Risk Officer, is responsible for enterprise-wide risk oversight. This includes establishing and monitoring of risk profiles and forward-looking risk identification and management. The Group's Risk function is made up of sub-functions covering all risks to our operations and forms part of the second line of defence. They are independent from the sales and trading functions, ensuring the necessary balance in risk/return decisions.

Risk management and internal control systems

The Directors are responsible for maintaining and reviewing the effectiveness of risk management and internal control systems, and for determining the aggregate level and risk types they are willing to accept in achieving the Group's business objectives.

On behalf of the Board, the Group's Audit Committee has responsibility for oversight of risk management and internal controls over financial reporting, and the Group's Risk Committee has responsibility for oversight of risk management and internal controls other than for financial reporting.

The Directors, through the Group's Risk Committee and the Group's Audit Committee, conduct an annual review of the effectiveness of our system of risk management and internal control. The Group's Risk Committee and the Group's Audit Committee received confirmation that executive management has taken or is taking the necessary actions to remedy any failings or weaknesses identified through the operation of our framework of controls.

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 Risk and IT functions, 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 BCBS 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 our subsidiaries to process risk information within business lines and risk functions.

Risk measurement and reporting structures deployed at Group level are applied throughout global businesses and major operating subsidiaries through a common operating model for integrated risk management and control. This model sets out the respective responsibilities of Group, global business and country level risk functions in respect of such matters as risk governance and oversight, compliance risks, approval authorities and lending guidelines, global and local scorecards, management information and reporting, and relations with third parties, including regulators, rating agencies and auditors.

Risk analytics and model governance

The Group's Risk functions manage a number of analytics disciplines supporting model development and management, including rating, scoring, economic capital and stress testing models for different risk types and business segments. They formulate technical responses to industry developments and regulatory policy in the field of risk analytics, supports the development of the HSBC Group's global risk model, develop local risk model and oversee the use around the Group toward our implementation targets for IRB approaches.

Model governance is under the general oversight of HSBC Group Model Oversight Committee ("MOC"). Local Model Oversight Committees ("Local MOCs") are established for Wholesale Credit and Market Risk ("WCMR") and Retail Banking and Wealth Management ("RBWM") Risk respectively with comparable terms of reference as HSBC Group MOC.

Models are also subject to an independent model review and validation process led by the Independent Model Review team within the HSBC Global Risk. The Independent Model Review team provides robust challenge to the modelling approaches used across the HSBC Group, including HASE, and ensures that the performance of those models is transparent and that their limitations are visible to key stakeholders.

Linkage to the 2018 Annual Report

Basis of consolidation

The basis of consolidation for financial accounting purposes is in accordance with Hong Kong Financial Reporting Standards ("HKFRS"), as described in note 1 on the consolidated financial statements in the Group's 2018 Annual Report.

The basis of consolidation for regulatory purposes is different from that for accounting purposes. Subsidiaries included in the consolidation for regulatory purposes are specified in a notice from the HKMA in accordance with section 3C(1) of the BCR.

Subsidiaries not included in consolidation for regulatory purposes are securities and insurance companies that are authorised and supervised by regulators and are subject to supervisory arrangements regarding the maintenance of adequate capital to support business activities comparable to those prescribed for authorised institutions ("AI") under the BCR and the Banking Ordinance. The capital invested by the Group in these subsidiaries is deducted from the capital base subject to certain thresholds, as determined in accordance with Part 3 of the BCR.

For insurance entities, the figures shown below exclude deferred acquisition cost assets as these are derecognised for consolidation purpose due to the recognition of the present value of in-force long-term insurance business ("PVIF") on long-term insurance contracts and investment contracts with discretionary participation features at Group level. As at 31 December 2018, the PVIF asset of HK$15,910m and the related deferred tax liability, however, are recognised at the consolidated group level only, and are therefore also not included in the asset or equity positions for the standalone entities shown below.

As at 31 December 2018, there are no subsidiaries which are included within both the accounting scope of consolidation and the regulatory scope of consolidation but the method of consolidation differs.

There are also no subsidiaries which are included within the regulatory scope of consolidation but not included within the accounting scope of consolidation as at 31 December 2018.

The Group operates subsidiaries in different territories where capital is governed by local rules and there may be restrictions on the transfer of regulatory capital and funds between members of the Group.

The Group maintains a regulatory reserve to satisfy the provisions of the Banking Ordinance and local regulatory requirements for prudential supervision purposes. As at 31 December 2018, the effect of this requirement is to restrict the amount of reserves which can be distributed to shareholders by HK$4,982m.

There are no relevant capital shortfalls in any of the Group's subsidiaries which are not included in its consolidation group for regulatory purposes as at 31 December 2018.

A list of subsidiaries not included in consolidation for regulatory purposes is shown below:

Table 2: List of subsidiaries outside the regulatory scope of consolidation

		As at 31 Dec 2018	
	Principal activities	**Total assets* HK$m**	**Total equity* HK$m**
Hang Seng Futures Ltd	Futures brokerages	**102**	**102**
Hang Seng Investment Management Ltd	Fund management	**1,528**	**1,512**
Hang Seng Investment Services Ltd	Provision of investment commentaries	**9**	**9**
Hang Seng Securities Ltd	Stockbroking	**2,253**	**1,039**
Hang Seng Insurance Co. Ltd and its subsidiaries	Retirement benefits and life assurance	**135,763**	**12,533**
Hang Seng Qianhai Fund Management Co. Ltd	Fund raising, fund sales and asset management	**99**	**82**

** Prepared in accordance with HKFRS*

The approaches used in calculating the Group's regulatory capital and RWA are in accordance with the BCR. The Group uses the advanced internal ratings-based approach to calculate its credit risk for the majority of its non-securitisation exposures. For counterparty credit risk, the Group uses the current exposure method to calculate its default risk exposures. For market risk, the Group uses an internal models approach to calculate its general market risk for the risk categories of interest rate and foreign exchange (including gold) exposures and the standardised (market risk) approach for calculating other market risk positions. For operational risk, the Group uses the standardised (operational risk) approach to calculate its operational risk.

Balance sheet reconciliation

The following table expands the balance sheet under the regulatory scope of consolidation to show separately the capital components that are reported in the "Composition of regulatory capital disclosures" template in Table 6. The capital components in this table contain a reference that shows how these amounts are included in Table 6.

Table 3: CC2 – Reconciliation of regulatory capital to balance sheet

	a	b	c
	Balance sheet as in published financial statements As at 31 Dec 2018	**Under regulatory scope of consolidation As at 31 Dec 2018**	**Cross-referenced to Definition of Capital Components**
	HK$m	**HK$m**	
Assets			
Cash and sight balances at central banks	**16,421**	**16,421**	
Placings with and advances to banks	**79,400**	**75,929**	
Trading assets	**47,164**	**47,164**	
Financial assets designated and otherwise mandatorily measured at fair value	**13,070**	**231**	
Derivative financial instruments	**8,141**	**8,164**	
Loans and advances to customers	**874,456**	**874,458**	
of which: Impairment allowances eligible for inclusion in Tier 2 capital		***1,171***	*(1)*
Financial investments	**428,532**	**329,022**	
Investment in subsidiaries	**-**	**7,104**	
Subordinated loans to subsidiaries	**-**	**915**	*(2)*
Interest in associates	**2,444**	**-**	
Investment properties	**10,108**	**7,187**	
Premises, plant and equipment	**30,510**	**30,169**	
Intangible assets	**16,751**	**504**	*(3)*
Other assets	**44,300**	**26,590**	
of which: Deferred tax assets ("DTAs")		***111***	*(4)*
Defined benefit pension fund net assets		***13***	*(5)*
Total assets	**1,571,297**	**1,423,858**	
Liabilities			
Current, savings and other deposit accounts	**1,154,415**	**1,157,281**	
Repurchase agreements – non-trading	**410**	**410**	
Deposits from banks	**2,712**	**2,712**	
Trading liabilities	**33,649**	**33,649**	
Financial liabilities designated at fair value	**33,454**	**33,006**	
of which: Gains and losses due to changes in own credit risk on fair valued liabilities		***1***	*(6)*
Derivative financial instruments	**8,270**	**8,461**	
of which: Gains and losses due to changes in own credit risk on fair valued liabilities		***11***	*(7)*
Certificates of deposit and other debt securities in issue	**3,748**	**3,748**	
Other liabilities	**45,247**	**39,268**	
Liabilities under insurance contracts	**120,195**	**-**	
Current tax liabilities	**696**	**695**	
Deferred tax liabilities	**6,394**	**3,657**	
of which: Deferred tax liabilities related to intangible assets		***41***	*(8)*
Deferred tax liabilities related to defined benefit pension fund		***2***	*(9)*
Total liabilities	**1,409,190**	**1,282,887**	
Equity			
Share capital	**9,658**	**9,658**	*(10)*
Retained profits	**123,350**	**102,260**	*(11)*
of which: Revaluation gains of investment properties		***6,741***	*(12)*
Regulatory reserve for general banking risks		***4,982***	*(13)*
Regulatory reserve eligible for inclusion in Tier 2 capital		***2,402***	*(14)*
Valuation adjustments		***123***	*(15)*
Other equity instruments	**6,981**	**6,981**	*(16)*
Other reserves	**22,093**	**22,072**	*(17)*
of which: Cash flow hedge reserve		***(4)***	*(18)*
Valuation adjustments		***25***	*(19)*
Revaluation reserve of properties		***19,802***	*(20)*
Total shareholders' equity	**162,082**	**140,971**	
Non-controlling interests	**25**	**-**	
Total equity	**162,107**	**140,971**	
Total equity and liabilities	**1,571,297**	**1,423,858**	

Table 4: LI1 – Differences between accounting and regulatory scopes of consolidation and mapping of financial statement categories with regulatory risk categories

		a	b	c	d	e	f	g
				Carrying values of items:				
		Carrying values as reported in published financial statements	Carrying values under scope of regulatory con-solidation	subject to credit risk framework	subject to counterparty credit risk framework	subject to the securi-tisation framework	subject to market risk framework	not subject to capital require-ments or subject to deduction from capital
As at 31 Dec 2018	*Footnotes*	HK$m	HK$m	HK$m	HK$m	HK$m	HK$m	HK$m
Assets								
Cash and sight balances at central banks		**16,421**	**16,421**	**16,421**	-	-	-	-
Placings with and advances to banks		**79,400**	**75,929**	**75,929**	-	-	-	-
Trading assets		**47,164**	**47,164**	-	-	-	**47,164**	-
Financial assets designated and otherwise mandatorily measured at fair value		**13,070**	**231**	**68**	**163**	-	-	-
Derivative financial instruments	*1*	**8,141**	**8,164**	-	**7,785**	-	**8,164**	**379**
Loans and advances to customers		**874,456**	**874,458**	**874,458**	-	-	-	-
Financial investments		**428,532**	**329,022**	**329,022**	-	-	-	-
Investment in subsidiaries		-	**7,104**	**7,104**	-	-	-	-
Subordinated loans to subsidiaries		-	**915**	-	-	-	-	**915**
Interest in associates		**2,444**	-	-	-	-	-	-
Investment properties		**10,108**	**7,187**	**7,187**	-	-	-	-
Premises, plant and equipment		**30,510**	**30,169**	**30,169**	-	-	-	-
Intangible assets	*2*	**16,751**	**504**	-	-	-	-	**463**
Other assets	*2, 3*	**44,300**	**26,590**	**24,818**	**1,648**	-	-	**122**
Total assets		**1,571,297**	**1,423,858**	**1,365,176**	**9,596**	-	**55,328**	**1,879**
Liabilities								
Current, savings and other deposit accounts		**1,154,415**	**1,157,281**	-	-	-	-	**1,157,281**
Repurchase agreements – non-trading		**410**	**410**	-	**410**	-	-	-
Deposits from banks		**2,712**	**2,712**	-	-	-	-	**2,712**
Trading liabilities		**33,649**	**33,649**	-	-	-	**33,649**	-
Financial liabilities designated at fair value		**33,454**	**33,006**	-	-	-	**31**	**32,975**
Derivative financial instruments	*1*	**8,270**	**8,461**	-	**8,461**	-	**8,461**	-
Certificates of deposit and other debt securities in issue		**3,748**	**3,748**	-	-	-	-	**3,748**
Other liabilities	*3*	**45,247**	**39,268**	-	**504**	-	-	**38,764**
Liabilities under insurance contracts		**120,195**	-	-	-	-	-	-
Current tax liabilities		**696**	**695**	-	-	-	-	**695**
Deferred tax liabilities		**6,394**	**3,657**	-	-	-	-	**3,657**
Total liabilities		**1,409,190**	**1,282,887**	-	**9,375**	-	**42,141**	**1,239,832**

1 Assets/liabilities arising from derivative contracts held in the regulatory trading book are subject to both market risk and counterparty credit risk because derivative contracts are mark to market and there is a risk that the counterparty may not be able to fulfil the contractual obligations. As a result, the amounts shown in column (b) do not equal the sum of columns (c) to (g).

2 The assets disclosed in column (g) are net of any associated deferred tax liability.

3 The difference in the carrying values reported in the financial statements in column (a) and the scope of regulatory consolidation in column (b) mainly represents (i) the differences between the financial and regulatory scope of consolidation, and (ii) the amounts of acceptance and endorsements being included as contingencies in accordance with the BCR, whilst for accounting purposes, acceptances and endorsements are recognised on the balance sheet.

Table 5: LI2 – Main sources of differences between regulatory exposure amounts and carrying values in financial statements

		a	b	c	d	e
			Items subject to:			
		Total	**credit risk framework**	**securitisation framework**	**counterparty credit risk framework**	**market risk framework**
As at 31 Dec 2018		**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**
1	Asset carrying value amount under scope of regulatory consolidation (as per template LI1)[1]	**1,421,979**	**1,365,176**	**-**	**9,596**	**55,328**
2	Liabilities carrying value amount under regulatory scope of consolidation (as per template LI1)[2]	**43,055**	**-**	**-**	**9,375**	**42,141**
3	Total net amount under regulatory scope of consolidation	**1,378,924**	**1,365,176**	**-**	**221**	**13,187**
4	Off-balance sheet amounts and potential future exposures for counterparty risk	**487,873**	**156,277**	**-**	**6,949**	**-**
5	Differences due to impairments	**2,542**	**2,542**	**-**	**-**	**-**
6	Differences due to recognised collateral	**(10,497)**	**(10,497)**	**-**	**-**	**-**
7	Differences arising from off-balance sheet amounts recognised in regulatory exposures	**(331,596)**	**-**	**-**	**-**	**-**
8	Differences due to credit risk mitigation	**3,449**	**-**	**-**	**3,449**	**-**
9	Differences arising from capital deductions	**(43)**	**-**	**-**	**-**	**-**
10	Exposure amounts considered for regulatory purposes	**1,530,652**	**1,513,498**	**-**	**10,619**	**13,187**

1 The amount shown in column (a) is equal to column (b) less column (g) in the Total assets row in Table 4.
2 The amount shown in column (a) is equal to column (b) less column (g) in the Total liabilities row in Table 4.

Explanations of differences between accounting and regulatory exposure amounts

Off-balance sheet amounts and potential future exposures for counterparty risk

Off-balance sheet amounts subject to credit risk regulatory framework includes undrawn portion of committed facilities, various trade finance commitments and guarantees, by applying credit conversion factor ("CCF") to these items and consideration of potential future exposures ("PFE") for counterparty risk.

Differences due to impairments

The carrying value of assets is net of impairments. From the regulatory perspective, only exposure value under the IRB approach and non-defaulted exposure under the standardised approach are before deducting impairments.

Differences due to recognised collateral

Exposure value under the standardised approach is calculated after deducting credit risk mitigation whereas accounting value is before such deductions.

Differences due to credit risk mitigation

In counterparty credit risk, differences arise between accounting carrying values and regulatory exposure as a result of the application of credit risk mitigation.

Explanations of differences between accounting fair value and regulatory prudent valuation

Fair value is defined as the best estimate of the price that would be received to sell an asset or be paid to transfer a liability in an orderly transaction between market participants at the measurement date.

Some fair value adjustments already reflect valuation uncertainty to some degree. These are market data uncertainty, model uncertainty and concentration adjustments.

However, it is recognised that a variety of valuation techniques using stressed assumptions and combined with the range of plausible market parameters at a given point in time may still generate unexpected uncertainty beyond fair value.

A series of additional valuation adjustments ("AVAs") are therefore required to reach a specified degree of confidence (the "Prudent Value") set by regulators and that differ both in terms of scope and measurement from the Group's own quantification for disclosure purposes.

AVAs should consider at the minimum: market price uncertainty, bid/offer (close out) uncertainty, model risk, concentration, administrative cost, unearned credit spread and funding fair value adjustment ("FFVA").

AVAs are not limited to level 3 exposures, for which a 95% uncertainty range is already computed and disclosed, but must also be calculated for any exposure for which the exit price cannot be determined with a high degree of certainty.

Capital and RWA

Regulatory capital disclosures

The following table sets out the detailed composition of the Group's regulatory capital using the composition of regulatory capital disclosures template as specified by the HKMA.

Table 6: CC1 – Composition of regulatory capital

		a	b
	As at 31 Dec 2018	**Component of regulatory capital HK$m**	**Cross-referenced to Table 3 Source based on reference numbers/letters of the balance sheet under the regulatory scope of consolidation**
	CET1 capital: instruments and reserves		
1	Directly issued qualifying CET1 capital instruments plus any related share premium	**9,658**	(10)
2	Retained earnings	**102,260**	(11)
3	Disclosed reserves	**22,072**	(17)
4	Directly issued capital subject to phase-out arrangements from CET1 (only applicable to non-joint stock companies)	**Not applicable**	Not applicable
5	Minority interests arising from CET1 capital instruments issued by consolidated bank subsidiaries and held by third parties (amount allowed in CET1 capital of the consolidation group)	**-**	
6	**CET1 capital before regulatory adjustments**	**133,990**	
	CET1 capital: regulatory deductions		
7	Valuation adjustments	**148**	(15) + (19)
8	Goodwill (net of associated deferred tax liability)	**-**	
9	Other intangible assets (net of associated deferred tax liabilities)	**463**	(3) - (8)
10	Deferred tax assets (net of associated deferred tax liabilities)	**111**	(4)
11	Cash flow hedge reserve	**(4)**	(18)
12	Excess of total EL amount over total eligible provisions under the IRB approach	**-**	
13	Credit-enhancing interest-only strip, and any gain-on-sale and other increase in the CET1 capital arising from securitisation transactions	**-**	
14	Gains and losses due to changes in own credit risk on fair valued liabilities	**12**	(6) + (7)
15	Defined benefit pension fund net assets (net of associated deferred tax liabilities)	**11**	(5) - (9)
16	Investments in own CET1 capital instruments (if not already netted off paid-in capital on reported balance sheet)	**-**	
17	Reciprocal cross-holdings in CET1 capital instruments	**-**	
18	Insignificant capital investments in CET1 capital instruments issued by financial sector entities that are outside the scope of regulatory consolidation (amount above 10% threshold)	**-**	
19	Significant capital investments in CET1 capital instruments issued by financial sector entities that are outside the scope of regulatory consolidation (amount above 10% threshold)	**-**	
20	Mortgage servicing rights (net of associated deferred tax liabilities)	**Not applicable**	Not applicable
21	Deferred tax assets arising from temporary differences (net of associated deferred tax liabilities)	**Not applicable**	Not applicable
22	Amount exceeding the 15% threshold	**Not applicable**	Not applicable
23	*of which: significant investments in the ordinary share of financial sector entities*	***Not applicable***	*Not applicable*
24	*of which: mortgage servicing rights*	***Not applicable***	*Not applicable*
25	*of which: deferred tax assets arising from temporary differences*	***Not applicable***	*Not applicable*
26	National specific regulatory adjustments applied to CET1 capital	**31,525**	
26a	Cumulative fair value gains arising from the revaluation of land and buildings (own-use and investment properties)	**26,543**	(12) + (20)
26b	Regulatory reserve for general banking risks	**4,982**	(13)
26c	Securitisation exposures specified in a notice given by the Monetary Authority	**-**	
26d	Cumulative losses below depreciated cost arising from the institution's holdings of land and buildings	**-**	
26e	Capital shortfall of regulated non-bank subsidiaries	**-**	
26f	Capital investment in a connected company which is a commercial entity (amount above 15% of the reporting institution's capital base)	**-**	
27	Regulatory deductions applied to CET1 capital due to insufficient additional tier 1 ("AT1") capital and Tier 2 capital to cover deductions	**-**	
28	**Total regulatory deductions to CET1 capital**	**32,266**	
29	**CET1 capital**	**101,724**	

Table 6: CC1 – Composition of regulatory capital *(continued)*

		a	b
		Component of regulatory capital HK$m	**Cross-referenced to Table 3 Source based on reference numbers/letters of the balance sheet under the regulatory scope of consolidation**
	AT1 capital: instruments		
30	Qualifying AT1 capital instruments plus any related share premium	**6,981**	
31	*of which: classified as equity under applicable accounting standards*	***6,981***	(16)
32	*of which: classified as liabilities under applicable accounting standards*	-	
33	Capital instruments subject to phase-out arrangements from AT1 capital	-	
34	AT1 capital instruments issued by consolidated bank subsidiaries and held by third parties (amount allowed in AT1 capital of the consolidation group)	-	
35	*of which: AT1 capital instruments issued by subsidiaries subject to phase-out arrangements*	-	
36	**AT1 capital before regulatory deductions**	**6,981**	
	AT1 capital: regulatory deductions	-	
37	Investments in own AT1 capital instruments	-	
38	Reciprocal cross-holdings in AT1 capital instruments	-	
39	Insignificant capital investments in AT1 capital instruments issued by financial sector entities that are outside the scope of regulatory consolidation (amount above 10% threshold)	-	
40	Significant capital investments in AT1 capital instruments issued by financial sector entities that are outside the scope of regulatory consolidation	-	
41	National specific regulatory adjustments applied to AT1 capital	-	
42	Regulatory deductions applied to AT1 capital due to insufficient Tier 2 capital to cover deductions	-	
43	**Total regulatory deductions to AT1 capital**	-	
44	**AT1 capital**	**6,981**	
45	**Tier 1 capital (T1 = CET1 + AT1)**	**108,705**	
	Tier 2 capital: instruments and provisions		
46	Qualifying Tier 2 capital instruments plus any related share premium	-	
47	Capital instruments subject to phase-out arrangements from Tier 2 capital	-	
48	Tier 2 capital instruments issued by consolidated bank subsidiaries and held by third parties (amount allowed in Tier 2 capital of the consolidation group)	-	
49	*of which: capital instruments issued by subsidiaries subject to phase-out arrangements*	-	
50	Collective provisions and regulatory reserve for general banking risks eligible for inclusion in Tier 2 capital	**3,573**	(1) + (14)
51	**Tier 2 capital before regulatory deductions**	**3,573**	
	Tier 2 capital: regulatory deductions		
52	Investments in own Tier 2 capital instruments	-	
53	Reciprocal cross-holdings in Tier 2 capital instruments	-	
54	Insignificant capital investments in Tier 2 capital instruments issued by financial sector entities that are outside the scope of regulatory consolidation (amount above 10% threshold)	-	
55	Significant capital investments in Tier 2 capital instruments issued by financial sector entities that are outside the scope of regulatory consolidation (net of eligible short positions)	**915**	(2)
56	National specific regulatory adjustments applied to Tier 2 capital	**(11,944)**	
56a	Add back of cumulative fair value gains arising from the revaluation of land and buildings (own-use and investment properties) eligible for inclusion in Tier 2 capital	**(11,944)**	((12)+(20))*45%
57	**Total regulatory adjustments to Tier 2 capital**	**(11,029)**	
58	**Tier 2 capital (T2)**	**14,602**	
59	**Total regulatory capital (TC = T1 + T2)**	**123,307**	
60	**Total RWA**	**611,885**	
	Capital ratios (as a percentage of RWA)		
61	**CET1 capital ratio**	**16.6%**	
62	**Tier 1 capital ratio**	**17.8%**	
63	**Total capital ratio**	**20.2%**	
64	**Institution-specific buffer requirement (capital conservation buffer plus countercyclical capital buffer plus higher loss absorbency requirements)**	**4.550%**	
65	*of which: capital conservation buffer requirement*	***1.875%***	
66	*of which: bank specific countercyclical capital buffer requirement*	***1.550%***	
67	*of which: higher loss absorbency requirement*	***1.125%***	
68	CET1 (as a percentage of RWA) available after meeting minimum capital requirements	**11.8%**	

Table 6: CC1 – Composition of regulatory capital *(continued)*

		a	b
		Component of regulatory capital HK$m	**Cross-referenced to Table 3 Source based on reference numbers/letters of the balance sheet under the regulatory scope of consolidation**
	National minima (if different from Basel 3 minimum)		
69	National CET1 minimum ratio	**Not applicable**	Not applicable
70	National Tier 1 minimum ratio	**Not applicable**	Not applicable
71	National Total capital minimum ratio	**Not applicable**	Not applicable
	Amounts below the thresholds for deduction (before risk weighting)		
72	Insignificant capital investments in CET1, AT1 and Tier 2 capital instruments issued by financial sector entities that are outside the scope of regulatory consolidation	**3,661**	
73	Significant capital investments in CET1 capital instruments issued by financial sector entities that are outside the scope of regulatory consolidation	**7,587**	
74	Mortgage servicing rights (net of associated deferred tax liabilities)	**Not applicable**	Not applicable
75	Deferred tax assets arising from temporary differences (net of associated deferred tax liabilities)	**Not applicable**	Not applicable
	Applicable caps on the inclusion of provisions in Tier 2 capital		
76	Provisions eligible for inclusion in Tier 2 in respect of exposures subject to the BSC approach, or the STC approach and SEC-ERBA, SEC-SA and SEC-FBA (prior to application of cap)	**715**	
77	Cap on inclusion of provisions in Tier 2 under the BSC approach, or the STC approach , and SEC-ERBA, SEC-SA and SEC-FBA	**789**	
78	Provisions eligible for inclusion in Tier 2 in respect of exposures subject to the IRB approach and SEC-IRBA (prior to application of cap)	**2,858**	
79	Cap for inclusion of provisions in Tier 2 under the IRB approach and SEC-IRBA	**2,947**	
	Capital instruments subject to phase-out arrangements (only applicable between 1 Jan 2018 and 1 Jan 2022)		
80	Current cap on CET1 capital instruments subject to phase-out arrangements	**Not applicable**	Not applicable
81	Amount excluded from CET1 due to cap (excess over cap after redemptions and maturities)	**Not applicable**	Not applicable
82	Current cap on AT1 capital instruments subject to phase-out arrangements	-	
83	Amount excluded from AT1 capital due to cap (excess over cap after redemptions and maturities)	-	
84	Current cap on Tier 2 capital instruments subject to phase-out arrangements	-	
85	Amount excluded from Tier 2 capital due to cap (excess over cap after redemptions and maturities)	-	

Notes to the template:

Elements where a more conservative definition has been applied in the BCR relative to that set out in Basel III capital standards:

		Hong Kong basis	**Basel III basis**
	As at 31 Dec 2018	**HK$m**	**HK$m**
10	Deferred tax assets (net of associated deferred tax liabilities)	**111**	**31**

Explanation

As set out in paragraphs 69 and 87 of the Basel III text issued by the Basel Committee (December 2010), DTAs of the bank to be realised are to be deducted, whereas DTAs which relate to temporary differences may be given limited recognition in CET1 capital (and hence be excluded from deduction from CET1 capital up to the specified threshold). In Hong Kong, an AI is required to deduct all DTAs in full, irrespective of their origin, from CET1 capital. Therefore, the amount to be deducted as reported in row 10 may be greater than that required under Basel III.

The amount reported under the column "Basel III basis" in this box represents the amount reported in row 10 (i.e. the amount reported under the "Hong Kong basis") adjusted by reducing the amount of DTAs to be deducted which relate to temporary differences to the extent not in excess of the 10% threshold set for DTAs arising from temporary differences and the aggregate 15% threshold set for Mortgage servicing rights ("MSRs"), DTAs arising from temporary differences and significant investments in CET1 capital instruments issued by financial sector entities (excluding those that are loans, facilities and other credit exposures to connected companies) under Basel III.

Remarks:

The amount of the 10% threshold mentioned above is calculated based on the amount of CET1 capital determined in accordance with the deduction methods set out in BCR Schedule 4F. The 15% threshold is referring to paragraph 88 of the Basel III text issued by the Basel Committee (December 2010) and has no effect to the Hong Kong regime.

The following is a summary of the Group's CET1 capital and AT1 capital instruments.

Table 7: CCA – Main features of regulatory capital instruments

		a	
As at 31 Dec 2018		**Quantitative / qualitative information**	
		1) Ordinary shares	2) Perpetual subordinated loan (US$ 900 million)
1	Issuer	Hang Seng Bank Limited	Hang Seng Bank Limited
2	Unique identifier (e.g. CUSIP, ISIN or Bloomberg identifier for private placement)	HK0011000095	N/A
3	Governing law(s) of the instrument	Laws of Hong Kong	Laws of Hong Kong
	Regulatory treatment		
4	Transitional Basel III rules[1]	N/A	N/A
5	Post-transitional Basel III rules[2]	Common Equity Tier 1	Additional Tier 1
6	Eligible at solo /group /solo and group	Group and Solo	Group and Solo
7	Instrument type (types to be specified by each jurisdiction)	Ordinary shares	Perpetual debt instrument
8	Amount recognised in regulatory capital (currency in millions, as of most recent reporting date)	HK$ 9,658 million	HK$ 6,981 million
9	Par value of instrument	No par value (Total amount HK$ 9,658 million)	US$ 900 million
10	Accounting classification	Shareholders' equity	Shareholders' equity
11	Original date of issuance	Various	22 Dec 2014
12	Perpetual or dated	Perpetual	Perpetual
13	Original maturity date	No maturity	No maturity
14	Issuer call subject to prior supervisory approval	N/A	Yes
15	Optional call date, contingent call dates and redemption amount	N/A	22 December 2019 at par value
16	Subsequent call dates, if applicable	N/A	Callable on any interest payment date after first call date
	Coupons / dividends		
17	Fixed or floating dividend/coupon	N/A	Floating
18	Coupon rate and any related index	N/A	12-month US$ LIBOR + 3.84%
19	Existence of a dividend stopper	N/A	No
20	Fully discretionary, partially discretionary or mandatory	Fully discretionary	Fully discretionary
21	Existence of step up or other incentive to redeem	N/A	No
22	Non-cumulative or cumulative	Noncumulative	Noncumulative
23	Convertible or non-convertible	Non-convertible	Non-convertible
24	If convertible, conversion trigger(s)	N/A	N/A
25	If convertible, fully or partially	N/A	N/A
26	If convertible, conversion rate	N/A	N/A
27	If convertible, mandatory or optional conversion	N/A	N/A
28	If convertible, specify instrument type convertible into	N/A	N/A
29	If convertible, specify issuer of instrument it converts into	N/A	N/A
30	Write-down feature	No	Yes
31	If write-down, write-down trigger(s)	N/A	Non-Viability Event. Hong Kong Monetary Authority – Contractual
32	If write-down, full or partial	N/A	Full
33	If write-down, permanent or temporary	N/A	Permanent
34	If temporary write-down, description of write-up mechanism	N/A	N/A
35	Position in subordination hierarchy in liquidation (specify instrument type immediately senior to instrument in the insolvency creditor hierarchy of the legal entity concerned).	Represents the most subordinated claim in liquidation	Subordinated to the claims of all Senior Creditors (including any holders of Tier 2 Instruments)
36	Non-compliant transitioned features	No	No
37	If yes, specify non-compliant features	N/A	N/A
	Terms and conditions	Terms and conditions - Ordinary shares	Terms and conditions – Perpetual subordinated loan

Footnotes:

1 *Regulatory treatment of capital instruments subject to transitional arrangements provided for in Schedule 4H to the BCR.*

2 *Regulatory treatment of capital instruments not subject to transitional arrangements provided for in Schedule 4H to the BCR.*

Countercyclical capital buffer ratio

The countercyclical capital buffer ("CCyB") is calculated as the weighted average of the applicable CCyB ratios in effect in the jurisdictions in which banks have private sector credit exposures. The Group uses country of business as the basis of geographical allocation for the majority of its credit risk and risk country for market risk, which is defined by considering the country of incorporation, location of guarantor, headquarter domicile, distribution of revenue and booking country.

Table 8: CCyB1 – Geographical distribution of credit exposures used in countercyclical capital buffer

	As at 31 Dec 2018		a	c	d	e
	Geographical breakdown by Jurisdiction ("J")	*Footnotes*	**Applicable JCCyB ratio in effect %**	**RWA used in computation of CCyB ratio HK$m**	**AI-specific CCyB ratio %**	**CCyB amount HK$m**
1	Hong Kong SAR		**1.875**	**426,105**		
2	Norway		**2.000**	**1**		
3	Sweden		**2.000**	**1**		
4	United Kingdom		**1.000**	**715**		
5	**Sum**	*1*		**426,822**		
6	**Total**	*2*		**515,917**	**1.550**	**9,484**

1 This represents the sum of RWA for the private sector credit exposures in jurisdictions with a non-zero countercyclical buffer rate.
2 The total RWA used in the computation of the CCyB ratio in column (c) represents the total RWA for the private sector credit exposures in all jurisdictions to which the bank is exposed, including jurisdictions with no countercyclical buffer rate or with a countercyclical buffer rate set at zero. The CCyB amount in column (e) represents the Group's total RWA multiplied by the AI-specific CCyB ratio in column (d).

The major driver for the movement of the AI-specific CCyB ratio during the reporting period is due to a change in reporting methodology.

Leverage ratio

The following table shows the leverage ratio, Tier 1 capital and total exposure measure as contained in the "Leverage Ratio" return submitted to the HKMA under the requirements specified in Part 1C of the BCR.

Table 9: LR2 – Leverage ratio

		a	b
		31 Dec 2018	30 Sep 2018
		HK$m	HK$m
	On-balance sheet exposures		
1	On-balance sheet exposures (excluding those arising from derivative contracts and securities financing transactions ("SFTs"), but including collateral)	**1,417,917**	1,350,327
2	Less: Asset amounts deducted in determining Tier 1 capital	**(32,258)**	(31,238)
3	**Total on-balance sheet exposures (excluding derivative contracts and SFTs)**	**1,385,659**	1,319,089
	Exposures arising from derivative contracts		
4	Replacement cost associated with all derivative contracts (where applicable net of eligible cash variation margin and/or with bilateral netting)	**3,771**	5,278
5	Add-on amounts for PFE associated with all derivative contracts	**10,544**	12,076
6	Gross-up for derivatives collateral provided where deducted from the balance sheet assets pursuant to the applicable accounting framework	**-**	-
7	Less: Deductions of receivables assets for cash variation margin provided under derivative contracts	**-**	-
8	Less: Exempted central counterparty ("CCP") leg of client-cleared trade exposures	**-**	-
9	Adjusted effective notional amount of written credit derivative contracts	**-**	-
10	Less: Adjusted effective notional offsets and add-on deductions for written credit derivative contracts	**-**	-
11	**Total exposures arising from derivative contracts**	**14,315**	17,354
	Exposures arising from SFTs		
12	Gross SFT assets (with no recognition of netting), after adjusting for sale accounting transactions	**461**	3,696
13	Less: Netted amounts of cash payables and cash receivables of gross SFT assets	**-**	-
14	Counterparty credit risk ("CCR") exposure for SFT assets	**50**	248
15	Agent transaction exposures	**-**	-
16	**Total exposures arising from SFTs**	**511**	3,944
	Other off-balance sheet exposures		
17	Off-balance sheet exposure at gross notional amount	**487,873**	483,594
18	Less: Adjustments for conversion to credit equivalent amounts	**(408,609)**	(402,436)
19	**Off-balance sheet items**	**79,264**	81,158
	Capital and total exposures		
20	Tier 1 capital	**108,705**	107,301
20a	Total exposures before adjustments for specific and collective provisions	**1,479,749**	1,421,545
20b	Adjustments for specific and collective provisions	**(2,748)**	(2,909)
21	**Total exposures after adjustments for specific and collective provisions**	**1,477,001**	1,418,636
	Leverage ratio		
22	Leverage ratio	**7.4%**	7.6%

Table 10: LR1 – Summary comparison of accounting assets against leverage ratio exposure measure

	As at 31 Dec 2018	a
	Item	**Value under the LR framework HK$m**
1	Total consolidated assets as per published financial statements	**1,571,297**
2	Adjustment for investments in banking, financial, insurance or commercial entities that are consolidated for accounting purposes but outside the scope of regulatory consolidation	**(147,439)**
3	Adjustment for fiduciary assets recognised on the balance sheet pursuant to the applicable accounting standard but excluded from the LR exposure measure	**-**
4	Adjustments for derivative contracts	**6,151**
5	Adjustment for SFTs (i.e. repos and similar secured lending)	**50**
6	Adjustment for off-balance sheet ("OBS") items (i.e. conversion to credit equivalent amounts of OBS exposures)	**79,264**
6a	Adjustment for specific and collective provisions that are allowed to be excluded from exposure measure	**(2,748)**
7	Other adjustments	**(29,574)**
8	**Leverage ratio exposure measure**	**1,477,001**

Other adjustments mainly represent the regulatory deductions of property revaluation reserves and regulatory reserve to Tier 1 capital under the leverage ratio framework.

Overview of RWA and the minimum capital requirements

Table 11: OV1 – Overview of RWA

		a	b	c
		RWA		**Minimum capital requirements**
		31 Dec 2018 HK$m	30 Sep 2018 HK$m	**31 Dec 2018 HK$m**
1	Credit risk for non-securitisation exposures	**490,027**	478,406	**41,253**
2	*Of which: Standardised credit risk ("STC") approach*	***62,793***	*61,377*	***5,023***
2a	*Of which: Basic ("BSC") approach*	-	-	-
3	*Of which: Foundation internal ratings-based ("IRB") approach*	-	-	-
4	*Of which: Supervisory slotting criteria approach*	***8,725***	*8,720*	***740***
5	*Of which: Advanced IRB approach*	***418,509***	*408,309*	***35,490***
6	Counterparty default risk and default fund contributions	**2,663**	3,217	**224**
7	*Of which: Standardised approach for counterparty credit risk ("SA-CCR")**	***Not Applicable***	*Not Applicable*	***Not Applicable***
7a	*Of which: Current exposure method ("CEM")*	***2,631***	*3,177*	***221***
8	*Of which: Internal models (counterparty credit risk) ("IMM(CCR)") approach*	-	-	-
9	*Of which: Others*	***32***	*40*	***3***
10	Credit valuation adjustment ("CVA") risk	**1,833**	2,120	**147**
11	Equity positions in banking book under the simple risk-weight method and internal models method	**14,848**	15,976	**1,259**
12	Collective investment scheme ("CIS") exposures – Look-through approach ("LTA")*	**Not Applicable**	Not Applicable	**Not Applicable**
13	CIS exposures – Mandate-based approach ("MBA")*	**Not Applicable**	Not Applicable	**Not Applicable**
14	CIS exposures – Fall-back approach ("FBA")*	**Not Applicable**	Not Applicable	**Not Applicable**
14a	CIS exposures – combination of approaches*	**Not Applicable**	Not Applicable	**Not Applicable**
15	Settlement risk	**1**	-	-
16	Securitisation exposures in banking book	-	-	-
17	*Of which: Securitisation internal ratings-based ("SEC-IRBA") approach*	-	-	-
18	*Of which: Securitisation external ratings-based ("SEC-ERBA") approach*	-	-	-
19	*Of which: Securitisation standardised ("SEC-SA") approach*	-	-	-
19a	*Of which: Securitisation fall-back ("SEC-FBA") approach*	-	-	-
20	Market risk	**11,021**	12,715	**882**
21	*Of which: Standardised market risk ("STM") approach*	***38***	*70*	***3***
22	*Of which: Internal models ("IMM") approach*	***10,983***	*12,645*	***879***
23	Capital charge for switch between exposures in trading book and banking book (not applicable before the revised market risk framework takes effect)*	**Not Applicable**	Not Applicable	**Not Applicable**
24	Operational risk	**59,323**	57,680	**4,746**
25	Amounts below the thresholds for deduction (subject to 250% RW)	**18,967**	19,277	**1,608**
26	Capital floor adjustment	-	-	-
26a	Deduction to RWA	**(14,599)**	(13,984)	**(1,168)**
26b	*Of which: Portion of regulatory reserve for general banking risks and collective provisions which is not included in Tier 2 Capital*	-	-	-
26c	*Of which: Portion of cumulative fair value gains arising from the revaluation of land and buildings which is not included in Tier 2 Capital*	***(14,599)***	*(13,984)*	***(1,168)***
27	**Total**	**584,084**	575,407	**48,951**

1 RWA in this table are before the application of the 1.06 scaling factor, where applicable.

2 Minimum capital requirement represents the Pillar 1 capital charge at 8% of the RWA after application of the 1.06 scaling factor, where applicable.

3 Items marked with an asterisk (*) will be applicable only after their respective policy frameworks take effect. Until then, "Not applicable" is reported in the rows.

Total RWA increased by HK$8.7bn since last quarter. Credit risk RWA for non-securitisation exposures was the key contributor which increased by HK$11.6bn mainly driven by model updates and policy changes under IRB approach and loan growth. It was partly offset by market risk RWA decrease of HK$1.7bn mainly due to the movement in risk levels and RWA decrease on equity position by HK$1.1bn due to valuation change.

RWA flow statements

RWA flow statement for credit risk

Table 12: CR8 – RWA flow statement of credit risk exposures under IRB approach

		a
		Amount
		HK$m
1	RWA as at end of previous reporting period (30 Sep 2018)	**417,029**
2	Asset size	**2,385**
3	Asset quality	**(141)**
4	Model updates	**4,057**
5	Methodology and policy	**3,105**
6	Acquisitions and disposals	**-**
7	Foreign exchange movements	**(53)**
8	Other	**852**
9	**RWA as at end of reporting period (31 Dec 2018)**	**427,234**

1 Credit risk in this table represents the credit risk for non-securitisation exposures excluding counterparty credit risk.

RWA increased by HK$10.2bn in the fourth quarter of 2018, mainly due to model updates and policy changes relating to retail and corporate exposures of HK$7.2bn, and asset size increase from loan growth of HK$2.4bn.

RWA flow statement for market risk

Table 13: MR2 – RWA flow statement of market risk exposures under IMM approach

		a	b	c	d	e	f
		Value at risk ("VaR")	**Stressed VaR**	**Incremental risk charge ("IRC")**	**Comprehensive risk charge ("CRC")**	**Other**	**Total RWA**
		HK$m	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**
1	RWA as at end of previous reporting period (30 Sep 2018)	**4,947**	**7,698**	**-**	**-**	**-**	**12,645**
2	Movement in risk levels	**(1,049)**	**(628)**	**-**	**-**	**-**	**(1,677)**
3	Model updates/changes	**-**	**-**	**-**	**-**	**-**	**-**
4	Methodology and policy	**-**	**-**	**-**	**-**	**-**	**-**
5	Acquisitions and disposals	**-**	**-**	**-**	**-**	**-**	**-**
6	Foreign exchange movements	**6**	**9**	**-**	**-**	**-**	**15**
7	Other	**-**	**-**	**-**	**-**	**-**	**-**
8	**RWA as at end of reporting period (31 Dec 2018)**	**3,904**	**7,079**	**-**	**-**	**-**	**10,983**

Credit risk

Credit risk management

Credit risk is the risk that financial loss arises from the failure of a customer or counterparty to meet its obligations under a contract. It arises principally from lending, trade finance, and treasury businesses. The Group has dedicated standards, policies and procedures in place to control and monitor risk from all such activities.

There are dedicated credit risk functions, reported to Chief Risk Officer, responsible for centralised management of credit risk through:

– formulating credit policies on approval process, post disbursement monitoring, recovery process and large exposure;
– issuing guidelines on lending to specified market sectors, industries and products; the acceptability of specific classes of collateral or risk mitigations and valuation parameters for collateral;
– undertaking an independent review and objective assessment of credit risk for all commercial non-bank credit facilities in excess of designated amount prior to the facilities being committed to customers;
– controlling exposures to selected industries, counterparties, countries and portfolio types, etc. by setting limits;
– maintaining and developing credit risk rating/facility grading process to categorise exposures and facilitate focused management;
– reporting to senior executives and various committees on aspects of the Group loan portfolio;
– managing and directing credit-related systems initiatives; and
– providing advice and guidance to business units on various credit-related issues.

These credit risk functions work closely with other functions of the Group.

Credit risk operates through a hierarchy of individual credit approval authority limits. With delegation from the Board, Executive Committee delegates the credit approval authority limits to Chief Executive and empowers the Chief Executive to further delegate to Chief Risk Officer and senior management teams on individual basis. Chief Risk Officer is empowered by Chief Executive to further delegate the credit approval authority limits.

Business model/strategy will be reviewed regularly by different business units taking into consideration of current market condition and the Group's risk appetite. Credit risk policies and limits will also be reviewed to align with the direction of defined risk appetite and business strategy.

Credit Risk Management

The Group's exposure to credit risk arises from a wide range of customers and product types. To measure and manage the risk in these exposures, both to distinct customer types or product categories, the Group employs diverse risk rating systems and methodologies: judgmental, analytical, and hybrids of the two.

A fundamental principle of the Group's policy and approach is that analytical risk rating systems and scorecards are decision tools facilitating management, serving ultimately judgemental decisions for which individual approvers are accountable.

For individually assessed customers, the credit process provides for at least annual review of the facility granted. Review may be more frequent, as required by circumstances.

The Group adopts a set of standards that govern the process through which risk rating systems are initially developed, judged fit for purpose, approved and implemented, the conditions under which analytical risk model outcomes can be overridden by approvers; and the process of model performance monitoring and reporting. The framework emphasises on an effective dialogue between business line and risk management, suitable independence of decision takers and a good understanding and robust reflection on the part of senior management.

Analytical risk rating systems are not static and are subject to review and modification in light of the changing environment and the greater availability and quality of data. Processes are established to capture the relevant data for continuous model improvement.

We constantly seek to improve the quality of our risk management. IT systems that process credit risk data continue to be enhanced in order to deliver both comprehensive management information in support of business strategy and solutions to evolving regulatory reporting requirements.

Credit quality of assets

Tables 14 to 18 analyse credit exposures between defaulted and non-defaulted, changes in defaulted loans and debt securities, exposures by geographical locations, by industries and residual maturity on a regulatory consolidation basis. The exposures covered in these tables include loans, debt securities and off-balance sheet exposures. Loans are generally referred to as any on-balance sheet exposures included as credit risk for non-securitisation exposures, covering exposures to customers, banks, sovereigns and others. Cash items and non-financial assets are excluded.

Table 14: CR1 – Credit quality of exposures

		a	b	c	d
		Gross carrying amounts of			
		Defaulted exposures	**Non-defaulted exposures**	**Allowances/ impairments**	**Net values**
	As at 31 Dec 2018	**HK$m**	**HK$m**	**HK$m**	**HK$m**
1	Loans	**2,161**	**965,080**	**2,685**	**964,556**
2	Debt securities	**-**	**325,835**	**5**	**325,830**
3	Off-balance sheet exposures	**-**	**487,873**	**58**	**487,815**
4	**Total**	**2,161**	**1,778,788**	**2,748**	**1,778,201**

Table 15: CR2 – Changes in defaulted loans and debt securities

			a
			Amount
		Footnote	**HK$m**
1	Defaulted loans and debt securities at end of the previous reporting period (30 Jun 2018)		**2,638**
2	Loans and debt securities that have defaulted since the last reporting period		**584**
3	Returned to non-defaulted status		**(3)**
4	Amounts written off		**(568)**
5	Other changes	*1*	**(490)**
6	**Defaulted loans and debt securities at end of the current reporting period (31 Dec 2018)**		**2,161**

1 Other changes included repayment and foreign exchange movements.

Table 16: CRB1 – Exposures by geographical location

		Gross carrying amounts at 31 Dec 2018
	Footnote	**HK$m**
Hong Kong SAR		**1,621,496**
Others	*1*	**159,453**
Total		**1,780,949**

1 Any segment which constitutes less than 10% of total gross carrying amounts is disclosed on an aggregated basis under the category "Others".

Table 17: CRB2 – Exposures by industry

	Gross carrying amounts at 31 Dec 2018
	HK$m
Industrial, commercial and financial	
- Property development and investment	**325,305**
- Financial concerns	**355,884**
- Stockbrokers	**3,284**
- Wholesale and retail trade	**103,599**
- Manufacturing	**75,042**
- Transport and transport equipment	**20,057**
- Recreational activities	**396**
- Information technology	**13,766**
- Others	**290,613**
Individuals	**526,331**
Trade finance	**66,672**
Total	**1,780,949**

Table 18: CRB3 – Exposures by residual maturity

	Gross carrying amounts at 31 Dec 2018
	HK$m
Less than 1 year	**722,413**
Between 1 and 5 years	**520,031**
More than 5 years	**535,543**
Undated	**2,962**
Total	**1,780,949**

Impaired exposures, past due unimpaired exposures and renegotiated exposures

Tables 19 to 22 analyse impaired exposures, impairment allowances, past due but not impaired exposures and renegotiated exposures on a regulatory consolidation basis.

Our approach for determining impairment allowances, definitions for accounting purposes of "credit-impaired" and "renegotiated" are explained in Note 2(j) of the Group's 2018 Annual Report. The accounting definition of credit impaired and the regulatory definition of default are generally aligned.

The analysis of gross impaired loans and advances and impairment allowances by major industry sectors based on categories and definitions used by the Group is as follows:

Table 19: CRB4 – Impaired exposures and related allowances and write-offs by industry

As at 31 Dec 2018	Footnote	Gross loans and advances[1] HK$m	Gross impaired loans and advances HK$m	Overdue loans and advances HK$m	Specific provisions[2] HK$m	Collective provisions[2] HK$m	Impairment provisions (charged to) / released from profit and loss HK$m	Advances written off during the year HK$m
Residential mortgages		**244,324**	**185**	**54**	**(8)**	**(2)**	**8**	**8**
Real estate		**248,286**	**147**	**71**	**-**	**(223)**	**117**	**-**
Others	*3*	**384,526**	**1,828**	**1,460**	**(951)**	**(1,494)**	**(1,149)**	**997**
Total		**877,136**	**2,160**	**1,585**	**(959)**	**(1,719)**	**(1,024)**	**1,005**

1 The amounts shown in column "Gross loans and advances" represent the loans and advances to customers gross of provisions in the financial statements under the regulatory consolidation basis. The difference of total gross loans of HK$2m against the figure under an accounting consolidation basis represents the Bank's loans and advances to the Group's subsidiary which is outside the regulatory scope of consolidation.

2 The classification of specific and collective provisions follows the treatment specified in the completion instructions of the HKMA Capital Adequacy Ratio - MA(BS)3 return. According to the completion instructions, impairment provisions classified into Stage 1 and Stage 2 under HKFRS 9 are treated as collective provisions, while those classified under Stage 3 are treated as specific provisions. Provisions made for purchased or originated credit-impaired financial assets, under which any changes in lifetime expected credit losses will be recognised in the profit and loss account as in impairment gain or loss, are treated as specific provisions.

3 Any segment which constitutes less than 10% of total gross loans and advances to customers is disclosed on an aggregated basis under the category "Others".

Impaired loans and advances to customers are those loans and advances where objective evidence exists that full repayment of principal or interest is considered unlikely. Specific provisions are made after taking into account the value of collateral in respect of such loans and advances. The geographical information shown below has been classified by the location of the principal operations of the subsidiary and by the location of the branch responsible for advancing the funds.

Table 20: CRB5 – Impaired exposures and related allowances and write-offs by geographical location

As at 31 Dec 2018	Gross loans and advances[1] HK$m	Gross impaired loans and advances HK$m	Overdue loans and advances HK$m	Specific provisions[2] HK$m	Collective provisions[2] HK$m	Impairment provisions (charged to) / released from profit and loss HK$m	Advances written off during the year HK$m
Hong Kong SAR	**799,329**	**1,739**	**1,279**	**(644)**	**(1,421)**	**(639)**	**924**
China	**62,223**	**359**	**244**	**(256)**	**(289)**	**(326)**	**81**
Others	**15,584**	**62**	**62**	**(59)**	**(9)**	**(59)**	**-**
Total	**877,136**	**2,160**	**1,585**	**(959)**	**(1,719)**	**(1,024)**	**1,005**

1 The amounts shown in column "Gross loans and advances" represent the loans and advances to customers gross of provisions in the financial statements under the regulatory consolidation basis. The difference of total gross loans of HK$2m against the figure under an accounting consolidation basis represents the Bank's loans and advances to the Group's subsidiary which is outside the regulatory scope of consolidation.

2 The classification of specific and collective provisions follows the treatment specified in the completion instructions of the HKMA Capital Adequacy Ratio - MA(BS)3 return. Details can be found in footnote 2 under table 19 of this document.

Past due unimpaired exposures are those loans where customers have failed to make payments in accordance with the contractual terms of their facilities. Exposures past due for more than 90 days are considered impaired.

Table 21: CRB6 – Aging analysis of accounting past-due unimpaired exposures

As at 31 Dec 2018	Up to 29 days HK$m	30-59 days HK$m	60-89 days HK$m	Total HK$m
Loans and advances to customers held at amortised cost:				
- Personal	**3,545**	**337**	**120**	**4,002**
- Corporate and commercial	**2,458**	**21**	**30**	**2,509**
- Non-bank financial institutions	**3**	**-**	**-**	**3**
Placings with and advances to banks held at amortised cost	**-**	**-**	**-**	**-**
Other assets	**2**	**-**	**-**	**2**
Total	**6,008**	**358**	**150**	**6,516**

Table 22: CRB7 – Breakdown of renegotiated loans between impaired and unimpaired

	31 Dec 2018 HK$m
Impaired	**344**
Unimpaired	**-**
Total	**344**

Loans and advances to customers

Tables 23 to 26 analyse the loans and advances to customers by geographical locations, by industries and overdue and rescheduled loans and advances on an accounting consolidation basis, which is different from the basis of regulatory consolidation. As a result, the total gross loans and advances to customers in tables 23, 24 and 25 are different from that in tables 19 and 20.

The following analysis of loans and advances to customers by geographical areas is in accordance with the location of counterparties, after recognised risk transfer.

Table 23: Loans and advances to customers by geographical location

	Hong Kong	**Mainland China**	**Others**	**Total**
As at 31 Dec 2018	**HK$m**	**HK$m**	**HK$m**	**HK$m**
Gross loans and advances to customers	**757,142**	**94,595**	**25,397**	**877,134**

Impaired loans and advances to customers are those loans and advances where objective evidence exists that full repayment of principal or interest is considered unlikely. Specific provisions are made after taking into account the value of collateral, in respect of such loans and advances. The geographical information shown below has been classified by the location of the principal operations of the subsidiary and by the location of the branch responsible for advancing the funds.

Table 24: Impaired and overdue loans and advances to customers

	Hong Kong	**Mainland China**	**Others**	**Total**
As at 31 Dec 2018	**HK$m**	**HK$m**	**HK$m**	**HK$m**
Impaired gross loans and advances	**1,739**	**359**	**62**	**2,160**
Unimpaired gross loans and advances	**797,588**	**61,864**	**15,522**	**874,974**
Total gross loans and advances to customers	**799,327**	**62,223**	**15,584**	**877,134**
Impairment allowances				
- specific provisions	**(644)**	**(256)**	**(59)**	**(959)**
- collective provisions	**(1,421)**	**(289)**	**(9)**	**(1,719)**
Net loans and advances	**797,262**	**61,678**	**15,516**	**874,456**
Total impaired gross loans and advances as a percentage of total gross loans and advances to customers	**0.22%**	**0.58%**	**0.40%**	**0.25%**
Total allowances as a percentage of total gross loans and advances to customers	**0.26%**	**0.88%**	**0.44%**	**0.31%**
Overdue loans and advances to customers	**1,279**	**244**	**62**	**1,585**

The classification of specific and collective provisions follows the treatment specified in the completion instructions of the HKMA Capital Adequacy Ratio – MA(BS)3 return. Details can be found in footnote 2 under table 19 of this document.

The analysis of gross loans and advances to customers by industry sector based on categories and definitions contained in the "Quarterly Analysis of Loans and Advances and Provisions - (MA(BS)2A)" return submitted to the HKMA is as follows:

Table 25: Gross loans and advances to customers by industry sector

	Gross loans and advances	% of gross advances covered by collateral
As at 31 Dec 2018	HK$m	%
Industrial, commercial and financial sectors		
- property development	**67,295**	**38.6%**
- property investment	**145,791**	**86.0%**
- financial concerns	**8,737**	**45.6%**
- stockbrokers	**20**	**100.0%**
- wholesale and retail trade	**31,044**	**46.6%**
- manufacturing	**22,653**	**40.0%**
- transport and transport equipment	**13,077**	**59.4%**
- recreational activities	**177**	**34.5%**
- information technology	**8,736**	**2.8%**
- other	**84,705**	**70.3%**
Individuals		
- loans and advances for the purchase of flats under the Government Home Ownership Scheme, Private Sector Participation Scheme and Tenants Purchase Scheme	**25,664**	**100.0%**
- loans and advances for the purchase of other residential properties	**194,839**	**100.0%**
- credit card loans and advances	**29,793**	**0.0%**
- other	**30,275**	**52.0%**
Gross loans and advances for use in Hong Kong	**662,806**	**72.8%**
Trade finance	**36,127**	**29.6%**
Gross loans and advances for use outside Hong Kong	**178,201**	**36.5%**
Gross loans and advances to customers	**877,134**	**63.7%**

Collateral includes any tangible security that carries a fair market value and is readily marketable. This includes (but is not limited to) cash and deposits, stocks and bonds, mortgages over properties and charges over other fixed assets such as plant and equipment. Where collateral values are greater than gross loans and advances to customers, only the amount of collateral up to the gross loans and advances is included.

Loans and advances to customers that are more than three months overdue and their expression as a percentage of gross loans and advances to customers are as follows:

Table 26: Overdue loans and advances to customers

As at 31 Dec 2018	HK$m	%
Gross loans and advances which have been overdue with respect to either principal or interest for periods of:		
- more than three months but not more than six months	**533**	**0.06%**
- more than six months but not more than one year	**395**	**0.05%**
- more than one year	**657**	**0.07%**
Total	**1,585**	**0.18%**
of which:		
- specific provision	**(784)**	
- covered portion of overdue loans and advances	**485**	
- uncovered portion of overdue loans and advances	**1,100**	
- current market value of collateral held against the covered portion of overdue loans and advances	**996**	
Rescheduled loans and advances to customers	**102**	**0.01%**

Collateral held with respect to overdue loans and advances is mainly residential properties and commercial properties. The current market value of residential properties and commercial properties were HK$868m and HK$112m respectively.

Loans and advances with a specific repayment date are classified as overdue when the principal or interest is overdue and remains unpaid at period-end. Loans and advances repayable by regular instalments are treated as overdue when an instalment payment is overdue and remains unpaid at period-end. Loans and advances repayable on demand are classified as overdue either when a demand for repayment has been served on the borrower but repayment has not been made in accordance with the demand notice, or when the loans and advances have remained continuously outside the approved limit advised to the borrower for more than the overdue period in question.

Rescheduled loans and advances to customers are those loans and advances that have been rescheduled or renegotiated for reasons related to the borrower's financial difficulties. This will normally involve the granting of concessionary terms and resetting the overdue account to non-overdue status. Rescheduled loans and advances to customers are stated net of any advances which have subsequently become overdue for more than three months and which are included in "Overdue loans and advances to customers".

The amount of repossessed assets as at 31 December 2018 was HK$18m.

Overdue and rescheduled amounts relating to placings with and advances to banks and other assets

There were no impaired, overdue or rescheduled placings with and advances to banks, nor rescheduled other assets as at 31 December 2018.

Off-balance sheet exposures other than derivative transactions

The following table gives the nominal contract amounts and RWA of contingent liabilities and commitments. The information is consistent with that in the "Capital Adequacy Ratio" return required to be submitted to the HKMA by the Group. The return is prepared on a consolidated basis as specified by the HKMA under the requirement of section 3C(1) of the BCR.

For accounting purposes, acceptances and endorsements are recognised on the balance sheet in "Other assets". For the purpose of the BCR, acceptances and endorsements are included in the capital adequacy calculation as if they were contingencies.

Table 27: Off-balance sheet exposures other than derivative transactions

	31 Dec 2018
	HK$m
Contract amounts	
Direct credit substitutes	**4,315**
Transaction-related contingencies	**6,690**
Trade-related contingencies	**15,388**
Commitments that are unconditionally cancellable without prior notice	**400,982**
Commitments which have an original maturity of not more than one year	**6,072**
Commitments which have an original maturity of more than one year	**54,426**
Total	**487,873**
RWA	**47,926**

Credit risk under internal ratings-based approach

Qualitative disclosures related to internal models for measuring credit risk under IRB approach

(i) Nature of exposures within each IRB class

The Group adopts advanced IRB approach for the majority of its business under the approval granted by the HKMA. The following non-securitisation exposures are subject to advanced IRB approach:

– Corporate exposures including exposures to global large corporates, local large corporates, middle market corporates and small and medium-sized enterprises ("SME"), non-bank financial institutions and specialised lending.

– Sovereign exposures including exposures to central governments, government agencies, central monetary institutions, multilateral development banks and relevant international organisations.

– Bank exposures including exposures to banks and regulated securities firms.

– Retail exposures, including residential mortgages, qualifying revolving retail exposures, other retail exposures and retail SME exposures.

– Equity exposures.

– Other exposures mainly including notes and coins, premises, plant and equipment and other assets.

At 31 December 2018, the portion of exposure at default ("EAD") and RWA within the Group covered by IRB apporach are summarised in the following table. The remaining portions not covered by IRB approach are under STC approach.

Table 28: Percentage of total EAD and RWA covered by IRB approach

Portfolio	Percentage of total EAD under IRB approach	Percentage of total RWA under IRB approach
Corporate exposures (includes SME and other corporates and specialised lending)	**93%**	**87%**
Sovereign exposures	**100%**	**100%**
Bank exposures (including securities firms)	**100%**	**100%**
Residential mortgage loans	**90%**	**81%**
Other retail exposures	**92%**	**77%**
Equity exposures	**100%**	**100%**
Other exposures	**100%**	**100%**

The above table covers credit risk for non-securitisation exposures excluding counterparty credit risk. For counterparty credit risk, the percentage of total RWA covered by models is 70% for corporate exposures and 100% for bank exposures.

(ii) The internal rating system

Exposure to credit risk arises from a very wide range of customers and product types, and the risk rating systems in place to measure and monitor these risks are correspondingly diverse.

Credit risk exposures are generally measured and managed in portfolios of either distinct customer types or product categories. Risk rating systems for the former are designed to assess the default risk of, and loss severity associated with, customers who are typically managed as individual relationships; these rating systems tend to have a higher subjective content. Risk rating systems for the latter are generally more analytical, applying techniques such as behavioural analysis across product portfolios comprising large numbers of homogeneous transactions.

A fundamental principle of the Group's policy and approach is that analytical risk rating systems and scorecards are decision tools facilitating management, serving ultimately judgmental decisions for which individual approvers are accountable. In the case of automated decision-making processes, accountability rests with those responsible for the parameters built into those processes/systems and the controls surrounding their use. For distinct customers, the credit process requires at least annual review of facility limits granted. Review may be more frequent, as required by circumstances.

Group standards govern the process through which risk rating systems are initially developed, judged fit for purpose, approved and implemented; the conditions under which individual approvers can override analytical risk model outcomes; and the process of model performance monitoring and reporting. There is emphasis on an effective dialogue between business lines and risk management, appropriate independence of decision takers, and a good understanding and robust reflection on the part of senior management.

(iii) Application of IRB parameters

The Group's credit risk rating framework incorporates the probability of default ("PD") of a borrower and the loss severity, expressed in terms of EAD and loss given default ("LGD"). These measures are used to calculate both expected loss ("EL") and capital requirements, subject to any floors required by the HKMA. They are also used in conjunction with other inputs to inform rating assessments for the purpose of credit approval and many other risk management decisions. The narrative explanations that follow relate to the IRB advanced approaches, that is, IRB advanced for distinct customers and retail IRB for the portfolio managed retail business.

Table 29: Wholesale IRB credit risk models

Regulatory asset classes measured	**Component**	**Number of significant models**	**Model description and methodology**	**Number of years loss data**	**Regulatory Floors**
Central governments and central banks	PD	1	A shadow rating approach that includes macroeconomic and political factors, constrained with expert judgement.	>10	No
	LGD	1	An unsecured model built on assessment of structural factors that influence the country's long-term economic performance. For unsecured LGD, a floor of 45% is applied.	8	45%[1]
	EAD	1	A cross-classification model that uses both internal data and expert judgement, as well as information on similar exposure types from other asset classes.	8	EAD must be at least equal to the current utilisation of the balance at account level
Bank / Securities firm	PD	2	A statistical model that combines quantitative analysis on financial information with expert inputs and macroeconomic factors.	10	0.03%
	LGD	1	A quantitative model that produces both downturn and expected LGD. Several securities types are included in the model to recognise collateral in the LGD calculation. For unsecured LGD, a floor of 45% is applied.	10	45%[2]
	EAD	1	A quantitative model that assigns CCF taking into account product types and committed/uncommitted indicator to calculate EAD using current utilisation and available headroom.	10	EAD must be at least equal to the current utilisation of the balance at account level
Other Corporate / Small and medium sized corporates[3]	PD	12	The corporate models use financial information, macroeconomic information and market-driven data, and is complemented by a qualitative assessment. The Non-Bank Financial Institution ("NBFI") models which are the predominantly statistical models that combines quantitative analysis on financial information with expert inputs.	>=10	0.03%
	LGD	1	Regional statistical models covering all corporates, developed using historical loss/recovery data and various data inputs, including collateral information, facility seniority and customer geography.	>10	No
	EAD	1	Regional statistical models covering all corporates, developed using historical utilisation information and various data inputs, including product type and nature of commitment.	>10	EAD must be at least equal to the current utilisation of the balance at account level

1 LGD floor exempted for the People's Republic of China and Hong Kong Special Administrative Region

2 LGD floor exempted for intra-group entities

3 Excludes specialised lending exposures subject to supervisory slotting approach.

(iii) Application of IRB parameters *(continued)*

Table 30: Material retail IRB credit risk models

Regulatory asset classes measured	Component	Number of significant models	Model description and methodology	Number of years loss data	Regulatory Floors
Hong Kong - Hang Seng Personal Residential Mortgages (Residential mortgage exposures)	PD	1	Statistical model built on internal behavioural data and calibrated to a long-run default rate by segment.	>10	0.03%
	LGD	3	1 component based model and 2 historical average models based on estimate of loss incurred over a recovery period derived from historical data with downturn LGD based on the worst observed default rate.	>10	LGD floor of 10% at portfolio level
	EAD	1	Rule-based calculation based on current balance and estimated incurred interest which continues to be a conservative estimate for EAD.	>10	EAD must at least be equal to current balance
Hong Kong – Hang Seng Credit Cards (Qualifying revolving retail exposures and Other retail exposures to individuals)	PD	1	Statistical model built on internal behavioural data and calibrated to a long-run default rate by segment.	>10	0.03%
	LGD	1	Statistical model based on forecasting the amount of expected future losses with downturn adjustment.	>10	
	EAD	1	Statistical model which derives a credit limit utilization by segment which is used to determine the EAD.	>10	EAD must at least be equal to current balance
Hong Kong – Hang Seng Personal Loans (Qualifying revolving retail exposures and Other retail exposures to individuals)	PD	1	Statistical model built on internal behavioural data and calibrated to a long-run default rate by segment.	>10	PD floor of 0.03%
	LGD	1	Statistical model based on forecasting the amount of expected future losses with downturn adjustment.	> 10	
	EAD	1	EAD derived by different product types. Statistical model which derives a credit conversion factor to determine the proportion of undrawn limit to be added to the balance at observation for revolving nature while rule based calculation based on current balance for non-revolving nature.	> 10	EAD must at least be equal to current balance

These measures are used to calculate expected loss and capital requirements. They are also used in conjunction with other inputs to form rating assessments for the purpose of credit approval and for risk management decisions.

PD models are developed using statistical estimation generally based on a minimum of five years of historical data. The modelling approach is typically hybrid. EAD models are also generally developed using at least five years of historical observations and typically adopt one of two approaches:

- Closed-end products without the facility for additional drawdowns, EAD is estimated as the outstanding balance of accounts at the time of observation with predicted interest and fees; or
- EAD for products with the facility for additional drawdowns is estimated as the outstanding balance of accounts at the time of observation plus a credit conversion factor applied to the undrawn portion of the facility.

LGD estimates have more variation, particularly in respect of the time period that is used to quantify economic downturn assumptions.

For management information and reporting purposes, retail portfolios are segmented into 10 EL bands facilitating comparability across retail customer segment and product types. EL band is derived through a combination of PD and LGD.

(iv) Model Governance

Model governance is under the oversight of HSBC Group or HSBC Regional Model Oversight Committee ("HSBC Group MOC" or "HSBC Regional MOC"). Wholesale Credit and Markets MOC and Retail Risk ("Local MOCs") are established respectively in the Bank with comparable terms of reference as HSBC Group MOC or HSBC Regional MOC.

Local MOCs meet regularly and report to RMM. They are chaired by the Risk function, and its membership is drawn from Risk, Finance and Businesses. Its primary responsibilities are to oversee the framework for the management of model risk, bring a strategic approach to model-related issues across the Bank, and to oversee the governance of our risk rating models, their consistency, within the regulatory framework. Also, it identifies emerging risks for all aspects of the risk rating system, ensuring that model risk is managed within our risk appetite statement, and formally advises RMM / HSBC Group MOC / HSBC Regional MOC on any material model-related issues.

All new or materially changed IRB capital models require the HKMA and the Prudential Regulation Authority's ("PRA") approval and such models fall directly under the remit of Local MOCs and HSBC Group MOC / HSBC Regional MOC.

The approval of models/model changes is the responsibility of individual approvers. Model Owner/Technical Expert ensures that the model is technically sound, has been developed robustly and follows the relevant modelling policies, standards, internal and regulatory requirements. Whereas the Model User/Steward for the function ensures that the model makes sense to the business or function where it will be used and that the model satisfies the requirements from the business, function and regulators.

Compliance with the HSBC Group and local standards for model development, credit risk models validation and implementation are subject to an independent model review process led by the HSBC Independent Model Review team which is separated from the Risk Analytics functions that are responsible for the development, usage and management of models. The Independent Model Review team provides robust challenge to the modelling approaches used and ensures that the performance of those models is transparent and that their limitations are visible to key stakeholders.

HSBC Group Audit, local Internal Audit, or a comparable independent model review unit also conducts regular reviews of the risk rating model application by credit and business groups.

Credit risk under internal ratings-based approach

Table 31.1: CR6 – Credit risk exposures by portfolio and PD ranges – for IRB approach (Wholesale)

	a	b	c	d	e	f	g	h	i	j	k	l
As at 31 Dec 2018	**Original on-balance sheet gross exposure**	**Off-balance sheet exposures pre-CCF**	**Average CCF**	**EAD post-credit risk mitigation ("CRM") and post-CCF**	**Average PD**	**Number of obligors**	**Average LGD**	**Average maturity**	**RWA**	**RWA density**	**EL**	**Provisions^**
PD scale	**HK$m**	**HK$m**	**%**	**HK$m**	**%**		**%**	**years**	**HK$m**	**%**	**HK$m**	**HK$m**
Sovereign												
0.00 to < 0.15	**296,137**	**-**	**-**	**296,137**	**0.01**	**38**	**23.5**	**1.12**	**7,803**	**3**	**10**	
0.15 to < 0.25	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0.25 to < 0.50	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0.50 to < 0.75	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
0.75 to < 2.50	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
2.50 to < 10.00	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
10.00 to < 100.00	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
100.00 (Default)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Sub-total	**296,137**	**-**	**-**	**296,137**	**0.01**	**38**	**23.5**	**1.12**	**7,803**	**3**	**10**	**3**
Bank												
0.00 to < 0.15	**96,831**	**536**	**45.6**	**97,075**	**0.04**	**985**	**43.2**	**1.15**	**12,577**	**13**	**15**	
0.15 to < 0.25	**304**	**144**	**50.0**	**376**	**0.22**	**67**	**42.5**	**0.50**	**122**	**32**	**-**	
0.25 to < 0.50	**561**	**-**	**-**	**561**	**0.37**	**48**	**44.6**	**0.75**	**272**	**48**	**1**	
0.50 to < 0.75	**501**	**1**	**0.5**	**501**	**0.63**	**41**	**45.0**	**0.78**	**366**	**73**	**1**	
0.75 to < 2.50	**26**	**-**	**-**	**26**	**1.04**	**24**	**45.0**	**0.06**	**18**	**69**	**-**	
2.50 to < 10.00	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
10.00 to < 100.00	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
100.00 (Default)	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	
Sub-total	**98,223**	**681**	**46.5**	**98,539**	**0.04**	**1,165**	**43.2**	**1.14**	**13,355**	**14**	**17**	**4**
Corporate – small-and-medium sized corporates												
0.00 to < 0.15	**4,597**	**3,313**	**31.9**	**5,652**	**0.12**	**141**	**26.3**	**2.99**	**983**	**17**	**2**	
0.15 to < 0.25	**15,261**	**3,172**	**32.7**	**16,297**	**0.22**	**323**	**32.4**	**2.60**	**4,418**	**27**	**12**	
0.25 to < 0.50	**23,762**	**3,384**	**32.9**	**24,874**	**0.37**	**338**	**25.4**	**2.94**	**7,479**	**30**	**23**	
0.50 to < 0.75	**24,051**	**8,567**	**39.2**	**27,409**	**0.63**	**439**	**29.2**	**2.26**	**10,746**	**39**	**50**	
0.75 to < 2.50	**47,631**	**14,385**	**28.4**	**51,711**	**1.40**	**1,324**	**29.2**	**2.39**	**27,482**	**53**	**209**	
2.50 to < 10.00	**6,681**	**2,323**	**28.5**	**7,342**	**3.67**	**223**	**27.8**	**2.21**	**4,929**	**67**	**76**	
10.00 to < 100.00	**76**	**13**	**32.7**	**80**	**10.00**	**8**	**36.1**	**1.49**	**96**	**120**	**3**	
100.00 (Default)	**164**	**-**	**-**	**164**	**100.00**	**8**	**48.6**	**3.02**	**677**	**413**	**26**	
Sub-total	**122,223**	**35,157**	**32.2**	**133,529**	**1.10**	**2,804**	**28.7**	**2.51**	**56,810**	**43**	**401**	**855**
Corporate – others												
0.00 to < 0.15	**132,030**	**68,860**	**36.6**	**157,250**	**0.09**	**479**	**44.8**	**2.52**	**42,483**	**27**	**64**	
0.15 to < 0.25	**39,117**	**28,837**	**30.2**	**47,830**	**0.22**	**276**	**41.9**	**2.04**	**18,427**	**39**	**44**	
0.25 to < 0.50	**46,793**	**22,819**	**28.2**	**53,229**	**0.37**	**417**	**33.8**	**2.42**	**23,359**	**44**	**67**	
0.50 to < 0.75	**44,375**	**21,764**	**25.5**	**49,927**	**0.63**	**428**	**38.8**	**2.01**	**29,893**	**60**	**122**	
0.75 to < 2.50	**99,207**	**58,149**	**26.4**	**114,563**	**1.38**	**1,307**	**36.2**	**1.84**	**83,406**	**73**	**560**	
2.50 to < 10.00	**15,481**	**9,530**	**20.5**	**17,436**	**3.79**	**238**	**39.1**	**1.33**	**18,344**	**105**	**258**	
10.00 to < 100.00	**528**	**451**	**19.6**	**616**	**12.11**	**24**	**27.3**	**1.32**	**699**	**113**	**20**	
100.00 (Default)	**1,396**	**-**	**-**	**1,396**	**100.00**	**82**	**48.8**	**1.40**	**2,112**	**151**	**740**	
Sub-total	**378,927**	**210,410**	**30.1**	**442,247**	**1.01**	**3,251**	**40.0**	**2.17**	**218,723**	**49**	**1,875**	**2,487**

Table 31.2: CR6 – Credit risk exposures by portfolio and PD ranges – for IRB approach (Retail)

	a	b	c	d	e	f	g	h	i	j	k	l
As at 31 Dec 2018	Original on-balance sheet gross exposure	Off-balance sheet exposures	Average CCF	EAD post CRM and post-CCF	Average PD	Number of obligors	Average LGD	Average maturity	RWA	RWA density	EL	Provisions^
PD scale	**HK$m**	**HK$m**	**%**	**HK$m**	**%**		**%**	**years**	**HK$m**	**%**	**HK$m**	**HK$m**
Retail – qualifying revolving retail exposures ("QRRE")												
0.00 to < 0.15	**11,568**	**137,217**	**39.4**	**65,684**	**0.07**	**1,653,732**	**104.5**		**3,000**	**5**	**48**	
0.15 to < 0.25	**1,953**	**11,246**	**44.9**	**6,998**	**0.22**	**175,843**	**104.2**		**850**	**12**	**16**	
0.25 to < 0.50	**4,927**	**18,781**	**33.0**	**11,131**	**0.39**	**214,185**	**100.0**		**2,041**	**18**	**43**	
0.50 to < 0.75	**2,100**	**4,128**	**48.3**	**4,092**	**0.60**	**64,573**	**101.7**		**1,066**	**26**	**25**	
0.75 to < 2.50	**7,080**	**11,293**	**33.6**	**10,872**	**1.45**	**118,014**	**98.6**		**5,328**	**49**	**155**	
2.50 to < 10.00	**4,446**	**2,954**	**60.7**	**6,238**	**4.72**	**62,122**	**98.7**		**7,091**	**114**	**291**	
10.00 to < 100.00	**1,527**	**420**	**125.0**	**2,051**	**28.18**	**20,648**	**99.4**		**4,184**	**204**	**559**	
100.00 (Default)	**49**	**-**	**-**	**49**	**100.00**	**684**	**93.4**		**75**	**153**	**41**	
Sub-total	**33,650**	**186,039**	**39.5**	**107,115**	**1.13**	**2,309,801**	**102.8**		**23,635**	**22**	**1,178**	**2,971**
Retail – residential mortgage exposures												
0.00 to < 0.15	**144,661**	**1,155**	**100.0**	**145,816**	**0.09**	**46,857**	**17.7**		**28,192**	**19**	**23**	
0.15 to < 0.25	**36,008**	**287**	**100.0**	**36,295**	**0.18**	**30,586**	**16.7**		**6,459**	**18**	**11**	
0.25 to < 0.50	**766**	**6**	**100.0**	**772**	**0.34**	**210**	**15.9**		**128**	**17**	**-**	
0.50 to < 0.75	**18,057**	**144**	**100.0**	**18,201**	**0.52**	**8,151**	**16.3**		**3,168**	**17**	**16**	
0.75 to < 2.50	**14,971**	**118**	**100.0**	**15,089**	**0.95**	**14,827**	**15.9**		**3,052**	**20**	**23**	
2.50 to < 10.00	**4,627**	**36**	**100.0**	**4,663**	**4.75**	**3,224**	**15.2**		**2,265**	**49**	**34**	
10.00 to < 100.00	**3,468**	**27**	**100.0**	**3,495**	**14.94**	**2,936**	**14.8**		**2,706**	**77**	**77**	
100.00 (Default)	**124**	**-**	**-**	**124**	**100.00**	**78**	**14.1**		**202**	**163**	**1**	
Sub-total	**222,682**	**1,773**	**100.0**	**224,455**	**0.58**	**106,869**	**17.2**		**46,172**	**21**	**185**	**-**
Retail – small business retail exposures												
0.00 to < 0.15	**2,296**	**7**	**100.0**	**2,303**	**0.08**	**984**	**7.3**		**34**	**1**	**-**	
0.15 to < 0.25	**602**	**3**	**100.0**	**605**	**0.19**	**159**	**15.4**		**37**	**6**	**-**	
0.25 to < 0.50	**116**	**1**	**100.0**	**117**	**0.48**	**35**	**16.3**		**13**	**11**	**-**	
0.50 to < 0.75	**563**	**-**	**-**	**563**	**0.58**	**183**	**8.8**		**42**	**7**	**-**	
0.75 to < 2.50	**180**	**1**	**100.0**	**181**	**1.19**	**46**	**18.7**		**37**	**20**	**-**	
2.50 to < 10.00	**472**	**1**	**100.0**	**473**	**6.10**	**167**	**5.8**		**42**	**9**	**2**	
10.00 to < 100.00	**-**	**-**	**-**	**-**	**-**	**-**	**-**		**-**	**-**	**-**	
100.00 (Default)	**-**	**-**	**-**	**-**	**-**	**-**	**-**		**-**	**-**	**-**	
Sub-total	**4,229**	**13**	**100.0**	**4,242**	**0.89**	**1,574**	**9.2**		**205**	**5**	**2**	**-**
Other retail exposures to individuals												
0.00 to < 0.15	**2,450**	**2,530**	**10.2**	**2,708**	**0.07**	**26,981**	**11.2**		**60**	**2**	**-**	
0.15 to < 0.25	**1,842**	**2,593**	**15.5**	**2,244**	**0.20**	**23,618**	**15.7**		**139**	**6**	**1**	
0.25 to < 0.50	**146**	**1,180**	**14.5**	**317**	**0.41**	**11,998**	**88.2**		**176**	**56**	**1**	
0.50 to < 0.75	**4,946**	**165**	**28.3**	**4,992**	**0.55**	**21,838**	**64.3**		**2,398**	**48**	**17**	
0.75 to < 2.50	**4,136**	**1,238**	**27.6**	**4,478**	**1.57**	**28,741**	**53.7**		**2,910**	**65**	**41**	
2.50 to < 10.00	**3,530**	**189**	**28.8**	**3,584**	**4.67**	**25,417**	**63.9**		**3,358**	**94**	**110**	
10.00 to < 100.00	**780**	**8**	**129.1**	**791**	**15.82**	**6,992**	**68.8**		**1,060**	**134**	**86**	
100.00 (Default)	**17**	**-**	**-**	**17**	**100.00**	**372**	**162.0**		**39**	**229**	**24**	
Sub-total	**17,847**	**7,903**	**16.2**	**19,131**	**2.17**	**145,957**	**49.2**		**10,140**	**53**	**280**	**480**

Table 31.3: CR6 – Credit risk exposures by portfolio and PD ranges – for IRB approach (Total)

	a	b	c	d	e	f	g	h	i	j	k	l
As at 31 Dec 2018	Original on-balance sheet gross exposure	Off-balance sheet exposures	Average CCF	EAD post CRM and post-CCF	Average PD	Number of obligors	Average LGD	Average maturity*	RWA	RWA density	EL	Provisions^
	HK$m	**HK$m**	**%**	**HK$m**	**%**		**%**	**years**	**HK$m**	**%**	**HK$m**	**HK$m**
Total (all portfolios)	**1,173,918**	**441,976**	**34.3**	**1,325,395**	**0.68**	**2,571,459**	**36.7**	**1.79**	**376,843**	**28**	**3,948**	**6,800**

* The average maturity is relevant to wholesale portfolios only.

^ Provisions in this table represent the eligible provisions as defined under Division 1, Part 6 of the BCR which include the regulatory reserves for general banking risks and the impairment allowances reported under IRB approach.

Table 32: CR10 – Specialised lending under supervisory slotting criteria approach – other than high-volatility commercial real estate ("HVCRE")

As at 31 Dec 2018

		a	b	c	d(i)	d(ii)	d(iii)	d(iv)	d(v)	e	f
					EAD amount						
Supervisory Rating Grade	**Remaining Maturity**	**On-balance sheet exposure amount**	**Off-balance sheet exposure amount**	**Supervisory risk-weight ("SRW")**	**Project finance ("PF")**	**Object finance ("OF")**	**Commodities finance ("CF")**	**Income-producing real estate ("IPRE")**	**Total**	**RWA**	**Expected loss amount**
		HK$m	**HK$m**	**%**	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**
Strong^	Less than 2.5 years	**1,453**	**106**	**50%**	**-**	**-**	**-**	**1,511**	**1,511**	**756**	**-**
Strong	Less than 2.5 years	**2,581**	**419**	**70%**	**-**	**-**	**-**	**2,699**	**2,699**	**1,889**	**11**
Strong	Equal to or more than 2.5 years	**3,104**	**326**	**70%**	**-**	**-**	**-**	**3,229**	**3,229**	**2,261**	**13**
Good^	Less than 2.5 years	**222**	**-**	**70%**	**-**	**-**	**-**	**222**	**222**	**155**	**1**
Good	Less than 2.5 years	**2,222**	**342**	**90%**	**-**	**-**	**-**	**2,371**	**2,371**	**2,134**	**19**
Good	Equal to or more than 2.5 years	**725**	**926**	**90%**	**-**	**-**	**-**	**1,050**	**1,050**	**945**	**8**
Satisfactory		**456**	**151**	**115%**	**-**	**-**	**-**	**509**	**509**	**585**	**14**
Weak		**-**	**-**	**250%**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Default		**-**	**-**	**0%**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Total		**10,763**	**2,270**		**-**	**-**	**-**	**11,591**	**11,591**	**8,725**	**66**

^ Use of preferential risk-weights.

Table 33: CR10 – Equity exposures under the simple risk-weight method

As at 31 Dec 2018

	a	b	c	d	e
	On-balance sheet exposure amount	**Off-balance sheet exposure amount**	**SRW**	**EAD amount**	**RWA**
Categories	**HK$m**	**HK$m**	**%**	**HK$m**	**HK$m**
Publicly traded equity exposures	**68**	**-**	**300%**	**68**	**204**
All other equity exposures	**3,661**	**-**	**400%**	**3,661**	**14,644**
Total	**3,729**	**-**		**3,729**	**14,848**

Credit risk under standardised approach

The standardised approach is applied where exposures do not qualify for use of an IRB approach and/or where an exemption from IRB has been granted. The standardised approach requires banks to use risk assessments prepared by External Credit Assessment Institutions ("ECAI") to determine the risk weightings applied to rated counterparties.

The Group uses the following ECAIs to calculate its capital adequacy requirements under the STC approach prescribed in the BCR:

– Fitch Ratings
– Moody's Investors Service
– Standard & Poor's Ratings Services

Where exposures have been rated by the above-mentioned ECAIs, they are categorised under the following class of exposures:

– Sovereign exposures
– Public sector entity ("PSE") exposures
– Bank exposures
– Securities firm exposures
– Corporate exposures
– Collective investment scheme ("CIS") exposures

The process used to map ECAIs issuer ratings or ECAIs issue specific ratings in the Group's banking book is consistent with those prescribed in the Part 4 of the BCR.

Table 34: CR5 – Credit risk exposures by asset classes and by risk weights – for STC approach

		a	b	c	d	e	f	g	h	ha	i	j
	As at 31 Dec 2018											**Total credit risk exposures amount (post CCF and post CRM)**
	Risk weight	**0%**	**10%**	**20%**	**35%**	**50%**	**75%**	**100%**	**150%**	**250%**	**Others**	
		HK$m	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**
	Exposure class											
1	Sovereign exposures	**152**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**152**
2	PSE exposures	**16,588**	**-**	**4,312**	**-**	**15**	**-**	**-**	**-**	**-**	**-**	**20,915**
2a	*Of which: Domestic PSEs*	***-***	***-***	***2,053***	***-***	***-***	***-***	***-***	***-***	***-***	***-***	***2,053***
2b	*Of which: Foreign PSEs*	***16,588***	***-***	***2,259***	***-***	***15***	***-***	***-***	***-***	***-***	***-***	***18,862***
3	Multilateral development bank exposures	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
4	Bank exposures	**-**	**-**	**81**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**82**
5	Securities firm exposures	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
6	Corporate exposures	**-**	**-**	**160**	**-**	**393**	**-**	**41,070**	**-**	**-**	**-**	**41,623**
7	CIS exposures	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
8	Cash items	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
9	Exposures in respect of failed delivery on transactions entered into on a basis other than a delivery-versus-payment basis	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
10	Regulatory retail exposures	**-**	**-**	**-**	**-**	**-**	**4,181**	**-**	**-**	**-**	**-**	**4,181**
11	Residential mortgage loans	**-**	**-**	**-**	**22,090**	**-**	**526**	**2,504**	**-**	**-**	**-**	**25,120**
12	Other exposures which are not past due exposures	**-**	**-**	**-**	**-**	**-**	**-**	**6,386**	**-**	**-**	**-**	**6,386**
13	Past due exposures	**3**	**-**	**-**	**-**	**-**	**-**	**38**	**278**	**-**	**-**	**319**
14	Significant exposures to commercial entities	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
15	**Total**	**16,743**	**-**	**4,553**	**22,090**	**409**	**4,707**	**49,998**	**278**	**-**	**-**	**98,778**

Credit risk mitigation

The Group's approach when granting credit facilities is on the basis of capacity to repay, rather than primarily rely on credit risk mitigation. Depending on a customer's standing and the type of product, facilities may be provided on unsecured basis. Nevertheless, mitigation of credit risk is an important aspect of effective management and takes in many forms.

The Group's general policy is to promote the use of credit risk mitigation, justified by commercial prudence and good practice as well as capital efficiency. Policies covering the acceptability, structuring, control and valuation with regard to different types of collateral security are established to ensure that they are supported by evidence and continue to fulfil their intended purpose.

Concentration of credit risk exists when changes in geographic, economic or industry factors similarly affect groups of counterparties whose aggregate credit exposure is material in relation to the Group's total exposures. The Group's portfolio of financial instrument is diversified along geographic, industry and product sectors.

<u>Collateral</u>

The Group has implemented guidelines on the acceptability of specific classes of collateral or credit risk mitigation, and determined the valuation parameters. Such parameters are established prudently and are reviewed regularly in light of changing market environment and empirical evidence. Security structures and legal covenants are subject to regular review to ensure that they continue to fulfil their intended purpose and remain in line with local market practice.

While collateral is an important mitigant to credit risk, it is the Group's policy to establish that loans are within the customer's capacity to repay rather than to rely excessively on security. Facilities may be granted on unsecured basis depending on the customer's standing and the type of product. The principal collateral types are as follows:

– in the personal sector, charges over the properties, securities, investment funds and deposits;
– in the commercial and industrial sector, charges over business assets such as properties, stock, debtors, investment funds, deposits and machinery; and
– in the commercial real estate sector, charges over the properties being financed.

Repossessed assets are non-financial assets acquired in exchange for loans in order to achieve an orderly realisation, and are reported in the balance sheet within "Other assets" at the lower of fair value (less costs to sell) and the carrying amount of the loan (net of any impairment allowance). If excess funds arise after the debt has been repaid, they are made available either to repay other secured lenders with lower priority or are returned to the customer. The Group does not generally occupy repossessed properties for its business use.

Collateral held as security for financial assets other than loans and advances is determined by the nature of the instrument. Debt securities, treasury and other eligible bills are generally unsecured.

<u>Credit Risk Mitigation under IRB Approach</u>

The main types of recognised collateral taken by the Group are those as stated in section 80 of the BCR, including (but not limited to) cash on deposit, gold bullion, equities listed in a main index and/or a recognised exchange, collective investment schemes, various recognised debt securities, residential, industrial and commercial property, etc.

The Group's policy provides that netting is only to be applied where it has the legal right to do so. Consistent with the BCR, only bilateral netting arrangements are included for capital adequacy credit risk mitigation calculation.

In terms of the application within IRB approach, credit risk mitigants are considered in two broad categories: first, those which reduce the intrinsic PD of an obligor and therefore operate as adjustments to PD estimation, and second, those which affect estimated recoverability of obligations and require adjustment of LGD. The first includes, for example, full parental or group company guarantees; the second, collateral security of various kinds such as cash, equity, properties, fixed assets such as motor vehicles, plant and machinery, stock and debtors, bank and sovereign guarantees, etc.

<u>Credit Risk Mitigation under STC Approach</u>

As stated in sections 98 and 99 of the BCR, certain guarantees and credit derivative contracts are recognised for credit risk mitigation purposes. The main types of guarantees are from sovereigns, corporate and banks. With corporate guarantees, in order for it to be recognised as a credit risk mitigants, it must have a credit rating of A- or better by Standard & Poor's Ratings Services, Fitch Ratings or a credit rating of A3 or better by Moody's Investors Service.

Table 35: CR3 – Overview of recognised credit risk mitigation

		a	b1	b	d	f
		Exposures unsecured: carrying amount	**Exposures to be secured**	**Exposures secured by recognised collateral**	**Exposures secured by recognised guarantees**	**Exposures secured by recognised credit derivative contracts**
As at 31 Dec 2018		**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**
1	Loans	**317,615**	**646,941**	**488,910**	**129,514**	**-**
2	Debt securities	**323,766**	**2,064**	**-**	**2,018**	**-**
3	**Total**	**641,381**	**649,005**	**488,910**	**131,532**	**-**
4	*of which: Defaulted*	***706***	***496***	***170***	***3***	***-***

Table 36: CR7 – Effects on RWA of recognised credit derivative contracts used as recognised credit risk mitigation – for IRB approach

		a	b
		Pre-credit derivatives RWA	**Actual RWA**
As at 31 Dec 2018		**HK$m**	**HK$m**
1	Corporate – Specialised lending under supervisory slotting criteria approach (project finance)	**-**	**-**
2	Corporate – Specialised lending under supervisory slotting criteria approach (object finance)	**-**	**-**
3	Corporate – Specialised lending under supervisory slotting criteria approach (commodities finance)	**-**	**-**
4	Corporate – Specialised lending under supervisory slotting criteria approach (income-producing real estate)	**8,725**	**8,725**
5	Corporate – Specialised lending (high-volatility commercial real estate)	**-**	**-**
6	Corporate – Small-and-medium sized corporates	**56,810**	**56,810**
7	Corporate – Other corporates	**218,723**	**218,723**
8	Sovereigns	**6,199**	**6,199**
9	Sovereign foreign public sector entities	**-**	**-**
10	Multilateral development banks	**1,604**	**1,604**
11	Bank exposures – Banks	**13,253**	**13,253**
12	Bank exposures – Securities firms	**102**	**102**
13	Bank exposures – Public sector entities (excluding sovereign foreign public sector entities)	**-**	**-**
14	Retail – Small business retail exposures	**205**	**205**
15	Retail – Residential mortgages to individuals	**44,886**	**44,886**
16	Retail – Residential mortgages to property-holding shell companies	**1,286**	**1,286**
17	Retail – Qualifying revolving retail exposures	**23,635**	**23,635**
18	Retail – Other retail exposures to individuals	**10,140**	**10,140**
19	Equity – Equity exposures under market-based approach (simple risk-weight method)	**14,848**	**14,848**
20	Equity – Equity exposures under market-based approach (internal models method)	**-**	**-**
21	Equity – Equity exposures under PD/LGD approach (publicly traded equity exposures held for long-term investment)	**-**	**-**
22	Equity – Equity exposures under PD/LGD approach (privately owned equity exposures held for long-term investment)	**-**	**-**
23	Equity – Equity exposures under PD/LGD approach (other publicly traded equity exposures)	**-**	**-**
24	Equity – Equity exposures under PD/LGD approach (other equity exposures)	**-**	**-**
25	Equity – Equity exposures associated with equity investments in funds (CIS exposures)	**-**	**-**
26	Other – Cash items	**1,201**	**1,201**
27	Other – Other items	**40,466**	**40,466**
28	**Total (under the IRB calculation approaches)**	**442,083**	**442,083**

There is no effect in RWA, as the Group does not have credit derivative contracts used as recognised credit risk mitigation.

Table 37: CR4 – Credit risk exposures and effects of recognised credit risk mitigation – for STC approach

		a	b	c	d	e	f
		Exposures pre-CCF and pre-CRM		**Exposures post-CCF and post-CRM**		**RWA and RWA density**	
As at 31 Dec 2018		**On-balance sheet amount HK$m**	**Off-balance sheet amount HK$m**	**On-balance sheet amount HK$m**	**Off-balance sheet amount HK$m**	**RWA HK$m**	**RWA density %**
	Exposure classes						
1	Sovereign exposures	**-**	**-**	**152**	**-**	**-**	**-**
2	PSE exposures	**20,299**	**1,282**	**20,299**	**616**	**871**	**4**
2a	*Of which: Domestic PSEs*	***1,437***	***1,282***	***1,437***	***616***	***411***	***20***
2b	*Of which: Foreign PSEs*	***18,862***	***-***	***18,862***	***-***	***460***	***2***
3	Multilateral development bank exposures	**-**	**-**	**-**	**-**	**-**	**-**
4	Bank exposures	**82**	**-**	**82**	**-**	**17**	**21**
5	Securities firm exposures	**-**	**-**	**-**	**-**	**-**	**-**
6	Corporate exposures	**43,257**	**20,411**	**39,514**	**2,109**	**41,297**	**99**
7	CIS exposures	**-**	**-**	**-**	**-**	**-**	**-**
8	Cash items	**-**	**-**	**-**	**-**	**-**	**-**
9	Exposures in respect of failed delivery on transactions entered into on a basis other than a delivery-versus-payment basis	**-**	**-**	**-**	**-**	**-**	**-**
10	Regulatory retail exposures	**4,759**	**10,700**	**4,175**	**6**	**3,136**	**75**
11	Residential mortgage loans	**24,297**	**4,476**	**24,224**	**896**	**10,630**	**42**
12	Other exposures which are not past due exposures	**12,287**	**6,758**	**6,225**	**161**	**6,386**	**100**
13	Past due exposures	**319**	**-**	**319**	**-**	**456**	**143**
14	Significant exposures to commercial entities	**-**	**-**	**-**	**-**	**-**	**-**
15	**Total**	**105,300**	**43,627**	**94,990**	**3,788**	**62,793**	**64**

Model performance

The disclosure covers wholesale and retail models which have been approved by regulators. It validates the PD estimation by comparing the PD estimated by IRB Models against actual default experience. It shows our IRB models are generally conservative.

Table 38.1: CR9 – Back-testing of PD per portfolio – for IRB approach (Wholesale)

a	b	c			d	e	f		g	h	i
							Number of obligors [1,2]			**of which:**	
Portfolio	**PD Range**	**External rating equivalent (S&P)**	**External rating equivalent (Moody's)**	**External rating equivalent (Fitch)**	**Weighted average PD**	**Arithmetic average PD by obligors**	**Beginning of the year**	**End of the year**	**Defaulted obligors in the year**	**new defaulted obligors in the year**	**Average historical annual default rate**
As at 31 Dec 2018					%	%					%
Sovereign	0.00 to < 0.15	AAA to BBB	Aaa to Baa2	AAA to BBB	**0.01**	**0.02**	**21**	**23**	**-**	**-**	**-**
	0.15 to < 0.25	BBB-	Baa3	BBB-	-	-	-	-	-	-	-
	0.25 to < 0.50	BBB-	Baa3	BBB-	-	-	-	-	-	-	-
	0.50 to < 0.75	BB+ to BB	Ba1 to Ba2	BB+ to BB	-	-	-	-	-	-	-
	0.75 to < 2.50	BB- to B+	Ba3 to B2	BB- to B-	-	-	-	-	-	-	-
	2.50 to < 10.00	B to B-	B2 to Caa1	CCC+ to CCC	-	-	-	-	-	-	-
	10.00 to < 100.00	B- to C	Caa1 to C	CCC to C	-	-	-	-	-	-	-
Bank	0.00 to < 0.15	AAA to A-	Aaa to Baa1	AAA to BBB+	**0.03**	**0.06**	**64**	**66**	**-**	**-**	**-**
	0.15 to < 0.25	BBB+	Baa2	BBB	**0.22**	**0.22**	**8**	**5**	**-**	**-**	**-**
	0.25 to < 0.50	BBB	Baa3	BBB-	**0.37**	**0.37**	**8**	**7**	**-**	**-**	**-**
	0.50 to < 0.75	BBB-	Baa3	BBB-	**0.63**	**0.63**	**4**	**3**	**-**	**-**	**-**
	0.75 to < 2.50	BB+ to BB-	Ba1 to B1	BB+ to B+	**0.89**	**1.38**	**7**	**7**	**-**	**-**	**-**
	2.50 to < 10.00	B+ to B-	B2 to Caa1	B to CCC+	**5.75**	**5.75**	**1**	**-**	**-**	**-**	**-**
	10.00 to < 100.00	CCC+ to C	Caa1 to C	CCC to C	-	-	-	-	-	-	-
Corporate – small-and-medium sized corporates	0.00 to < 0.15	AAA to A-	Aaa to Baa1	AAA to BBB+	**0.12**	**0.11**	**141**	**105**	**-**	**-**	**-**
	0.15 to < 0.25	BBB+	Baa2	BBB	**0.22**	**0.22**	**161**	**260**	**-**	**-**	**0.07**
	0.25 to < 0.50	BBB	Baa3	BBB-	**0.37**	**0.37**	**297**	**278**	**5**	**-**	**0.64**
	0.50 to < 0.75	BBB-	Baa3	BBB-	**0.63**	**0.63**	**373**	**374**	**-**	**-**	**0.53**
	0.75 to < 2.50	BB+ to BB-	Ba1 to B1	BB+ to B+	**1.54**	**1.52**	**1,006**	**1,129**	**1**	**-**	**0.45**
	2.50 to < 10.00	B+ to B-	B2 to Caa1	B to CCC+	**3.63**	**3.70**	**131**	**186**	**3**	**-**	**1.16**
	10.00 to < 100.00	CCC+ to C	Caa1 to C	CCC to C	**10.00**	**10.00**	**2**	**6**	**1**	**-**	**21.43**
Corporate – others[3]	0.00 to < 0.15	AAA to A-	Aaa to Baa1	AAA to BBB+	**0.09**	**0.10**	**269**	**243**	**-**	**-**	**-**
	0.15 to < 0.25	BBB+	Baa2	BBB	**0.22**	**0.22**	**257**	**190**	**-**	**-**	**0.14**
	0.25 to < 0.50	BBB	Baa3	BBB-	**0.37**	**0.37**	**354**	**269**	**-**	**-**	**0.27**
	0.50 to < 0.75	BBB-	Baa3	BBB-	**0.63**	**0.63**	**326**	**319**	**3**	**-**	**0.72**
	0.75 to < 2.50	BB+ to BB-	Ba1 to B1	BB+ to B+	**1.41**	**1.54**	**1,098**	**1,056**	**16**	**-**	**1.19**
	2.50 to < 10.00	B+ to B-	B2 to Caa1	B to CCC+	**3.82**	**4.03**	**231**	**168**	**2**	**-**	**1.98**
	10.00 to < 100.00	CCC+ to C	Caa1 to C	CCC to C	**10.00**	**10.00**	**1**	**3**	**-**	**-**	**12.22**

1 The number of obligors represents the obligor rated by key wholesale IRB models directly.
2 The number of obligors on corporate counterparty is being reported at counterparty level, while the number of obligors on Multilateral Development Bank (grouped under Sovereign portfolio) and Bank are being reported at entity level. Sovereigns are reported at country level based on local currency and foreign currency ratings.
3 Specialised lending exposures are excluded.

BANKING DISCLOSURE STATEMENT *(unaudited) (continued)*

Table 38.2: CR9 – Back-testing of PD per portfolio – for IRB approach (Retail)

a	b	c	d	e	f		g	h	i
					Number of obligors			of which:	
Portfolio	**PD Range**	**External rating equivalent****	**Weighted average PD**	**Arithmetic average PD by obligors**	**Beginning of the year**	**End of the year**	**Defaulted obligors in the year**	**new defaulted obligors in the year**	**Average historical annual default rate**
As at 31 Dec 2018			%	%					%
Retail – QRRE	0.00 to < 0.15		**0.07**	**0.07**	**1,683,241**	**1,735,424**	**683**	**4**	**0.05**
	0.15 to < 0.25		**0.22**	**0.22**	**175,484**	**182,320**	**163**	**1**	**0.11**
	0.25 to < 0.50		**0.39**	**0.39**	**213,484**	**223,962**	**328**	**10**	**0.19**
	0.50 to < 0.75		**0.60**	**0.59**	**64,052**	**66,140**	**205**	**6**	**0.37**
	0.75 to < 2.50		**1.45**	**1.37**	**238,489**	**247,161**	**1,134**	**40**	**0.72**
	2.50 to < 10.00		**4.75**	**4.65**	**79,321**	**81,550**	**1,620**	**55**	**2.66**
	10.00 to < 100.00		**29.61**	**34.53**	**24,978**	**23,153**	**2,505**	**13**	**13.41**
Retail – residential mortgage exposures	0.00 to < 0.15		**0.04**	**0.04**	**78,709**	**47,802**	**17**	**1**	**0.02**
	0.15 to < 0.25		**0.19**	**0.19**	**5,338**	**31,174**	**-**	**-**	**0.03**
	0.25 to < 0.50		**0.35**	**0.35**	**3,584**	**226**	**1**	**-**	**0.12**
	0.50 to < 0.75		**0.57**	**0.58**	**1,491**	**8,306**	**5**	**-**	**0.22**
	0.75 to < 2.50		**1.63**	**1.66**	**16,106**	**15,347**	**32**	**-**	**0.25**
	2.50 to < 10.00		**3.01**	**3.12**	**1,050**	**3,356**	**12**	**-**	**1.28**
	10.00 to < 100.00		**12.47**	**14.61**	**270**	**3,048**	**27**	**-**	**8.47**
Retail – small business retail exposures	0.00 to < 0.15		**0.06**	**0.06**	**1,204**	**1,129**	**-**	**-**	**-**
	0.15 to < 0.25		**0.17**	**0.17**	**116**	**188**	**-**	**-**	**-**
	0.25 to < 0.50		**0.49**	**0.49**	**17**	**43**	**-**	**-**	**-**
	0.50 to < 0.75		**0.54**	**0.54**	**160**	**222**	**-**	**-**	**-**
	0.75 to < 2.50		**1.18**	**1.19**	**248**	**56**	**-**	**-**	**0.18**
	2.50 to < 10.00		**5.22**	**5.25**	**206**	**204**	**-**	**-**	**0.11**
	10.00 to < 100.00		-	-	**-**	**-**	**-**	**-**	-
Other retail exposures to individuals	0.00 to < 0.15		**0.08**	**0.08**	**14,710**	**14,384**	**1**	**-**	**0.01**
	0.15 to < 0.25		**0.20**	**0.20**	**12,254**	**12,085**	**6**	**-**	**0.08**
	0.25 to < 0.50		**0.47**	**0.40**	**8,722**	**7,974**	**15**	**-**	**0.23**
	0.50 to < 0.75		**0.53**	**0.53**	**19,338**	**22,698**	**49**	**2**	**0.36**
	0.75 to < 2.50		**1.58**	**1.62**	**25,630**	**26,138**	**181**	**25**	**1.02**
	2.50 to < 10.00		**4.69**	**4.98**	**26,624**	**26,491**	**610**	**70**	**3.06**
	10.00 to < 100.00		**15.88**	**16.71**	**7,618**	**7,347**	**764**	**11**	**11.58**

*** External rating equivalent is not applicable to retail exposures.*

Note:
The number of obligors is based on account level information for all retail IRB portfolios.

Counterparty credit risk exposures

Counterparty credit risk management

Counterparty credit risk ("CCR") arises for derivatives and SFTs. It is calculated in both the trading and non-trading books, and is the risk that a counterparty may default before settlement of the transaction. CCR is generated primarily in our wholesale global businesses.

The Bank uses current exposure method to calculate exposure value for CCR RWA. Under the approach, the EAD is calculated as current exposure plus regulatory add-ons.

The PFE measures used for CCR management are calibrated to the 95th percentile. The measures consider volatility, trade maturity and the counterparty legal documentation covering netting and collateral.

Limits for CCR exposures are assigned within the overall credit process. The credit risk function assigns a limit against each counterparty to cover derivatives exposure which may arise as a result of a counterparty default. The magnitude of this limit will depend on the overall risk appetite and type of derivatives trading undertaken with the counterparty.

Credit valuation adjustment

CVA risk is the risk of adverse moves in the credit valuation adjustments taken for expected credit losses on derivative transactions. The Bank uses the standardised approach to calculate the CVA capital charge.

Collateral arrangements

Our policy is 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 and 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.

Credit ratings downgrade

A credit rating downgrade clause in a Master Agreement or a credit rating downgrade threshold clause in a Credit Support Annex ("CSA") is designed to trigger an action if the credit rating of the affected party falls below a specified level. These actions may include the requirement to pay or increase collateral, the termination of transactions by the non-affected party or the assignment of transactions by the affected party.

At 31 December 2018, the potential value of the additional collateral pertaining to International Swaps and Derivatives Association ("ISDA") CSA downgrade thresholds that we would need to post with counterparties in the event of a one-notch or two-notch downgrade of our rating was nil.

Wrong-way risk

Wrong-way risk occurs when a counterparty's exposures are adversely correlated with its credit quality.

There are two types of wrong-way risk.

– General wrong-way risk occurs when the probability of counterparty default is positively correlated with general risk factors, for example, where a counterparty is resident and/or incorporated in a higher-risk country and seeks to sell a non-domestic currency in exchange for its home currency.

– Specific wrong-way risk occurs in self-referencing transactions. These are transactions in which exposure is driven by capital or financing instruments issued by the counterparty and occurs where exposure from the Bank's perspective materially increases as the value of the counterparty's capital or financing instruments referenced in the contract decreases. It is the HSBC policy that specific wrong-way transactions are approved on a case-by-case basis.

We use a range of tools to monitor and control wrong-way risk, including requiring the business to obtain prior approval before undertaking wrong-way risk transactions outside pre-agreed guidelines. The Traded Risk functions are responsible for the control and monitoring process within an overarching HSBC framework and limit framework.

Central counterparties

While exchange traded derivatives have been cleared through Central counterparties ("CCP")'s for many years, recent regulatory initiatives designed to reduce systemic risk in the banking system are directing increasing volumes of over-the-counter ("OTC") derivatives to be cleared through CCPs.

A dedicated CCP risk team has been established by the HSBC to manage the interface with CCPs and undertake in-depth due diligence of the unique risks associated with these organisations. This is to address an implication of the regulations that the HSBC's risk will be transferred from being distributed among individual, bilateral counterparties to a significant level of risk concentration on CCPs. The HSBC has developed a risk appetite framework to manage risk accordingly, on an individual CCP and global basis. The Bank has adopted such risk appetite framework with limits allocated to individual CCP.

Table 39: CCR1 – Analysis of counterparty default risk exposures (other than those to CCPs) by approaches

		a	b	c	d	e	f
		Replacement cost ("RC")	**PFE**	**Effective expected positive exposure ("EPE")**	**Alpha (α) used for computing default risk exposure**	**Default risk exposure after CRM**	**RWA**
As at 31 Dec 2018		**HK$m**	**HK$m**	**HK$m**		**HK$m**	**HK$m**
1	SA-CCR (for derivative contracts)	**-**	**-**		**1.4**	**-**	**-**
1a	CEM	**2,346**	**6,949**		**N/A**	**9,295**	**2,631**
2	IMM (CCR) approach			**-**	**-**	**-**	**-**
3	Simple Approach (for SFTs)					**-**	**-**
4	Comprehensive Approach (for SFTs)					**60**	**3**
5	VaR for SFTs					**-**	**-**
6	**Total**						**2,634**

Table 40: CCR2 – CVA capital charge

		a	b
		EAD post-CRM	**RWA**
As at 31 Dec 2018		**HK$m**	**HK$m**
	Netting sets for which CVA capital charge is calculated by the advanced CVA method	**-**	**-**
1	(i) VaR (after application of multiplication factor if applicable)		**-**
2	(ii) Stressed VaR (after application of multiplication factor if applicable)		**-**
3	Netting sets for which CVA capital charge is calculated by the standardised CVA method	**8,982**	**1,833**
4	**Total**	**8,982**	**1,833**

Table 41: CCR8 – Exposures to CCPs

As at 31 Dec 2018		a **Exposure after CRM HK$m**	b **RWA HK$m**
1	**Exposures of the AI as clearing member or client to qualifying CCPs (total)**		**29**
2	Default risk exposures to qualifying CCPs (excluding items disclosed in rows 7 to 10), of which:	**874**	**17**
3	*(i) Over-the-counter ("OTC") derivative transactions*	***874***	***17***
4	*(ii) Exchange-traded derivative contracts*	-	-
5	*(iii) Securities financing transactions*	-	-
6	*(iv) Netting sets subject to valid cross-product netting agreements*	-	-
7	Segregated initial margin	-	
8	Unsegregated initial margin	**227**	**5**
9	Funded default fund contributions	**163**	**7**
10	Unfunded default fund contributions	-	-
11	**Exposures of the AI as clearing member or client to non-qualifying CCPs (total)**		-
12	Default risk exposures to non-qualifying CCPs (excluding items disclosed in rows 17 to 20), of which:	-	-
13	*(i) OTC derivative transactions*	-	-
14	*(ii) Exchange-traded derivative contracts*	-	-
15	*(iii) Securities financing transactions*	-	-
16	*(iv) Netting sets subject to valid cross-product netting agreements*	-	-
17	Segregated initial margin	-	
18	Unsegregated initial margin	-	-
19	Funded default fund contributions	-	-
20	Unfunded default fund contributions	-	-

Table 42: CCR5 – Composition of collateral for counterparty default risk exposures (including those for contracts or transactions cleared through CCPs)

		a	b	c	d	e	f
		Derivative contracts				**SFTs**	
		Fair value of recognised collateral received		**Fair value of posted collateral**		**Fair value of recognised collateral received**	**Fair value of posted collateral**
As at 31 Dec 2018		**Segregated HK$m**	**Unsegregated HK$m**	**Segregated HK$m**	**Unsegregated HK$m**	**HK$m**	**HK$m**
1	Cash – domestic currency	**-**	**37**	**-**	**98**	**-**	**-**
2	Cash – other currencies	**-**	**467**	**-**	**129**	**410**	**-**
3	Domestic sovereign debt	-	-	-	-	-	-
4	Other sovereign debt	-	-	-	-	-	**470**
5	Government agency debt	-	-	-	-	-	-
6	Corporate bonds	-	-	-	-	-	-
7	Equity securities	-	-	-	-	-	-
8	Other collateral	-	-	-	-	-	-
9	**Total**	**-**	**504**	**-**	**227**	**410**	**470**

Counterparty default risk under internal ratings-based approach

Table 43: CCR4 – Counterparty default risk exposures (other than those to CCPs) by portfolio and PD range – for IRB approach

	a	b	c	d	e	f	g
As at 31 Dec 2018	**EAD post-CRM**	**Average PD**	**Number of obligors**	**Average LGD**	**Average maturity**	**RWA**	**RWA density**
PD scale	**HK$m**	**%**		**%**	**years**	**HK$m**	**%**
Sovereign							
0.00 to < 0.15	**26**	**0.04**	**1**	**45.0**	**1.00**	**3**	**9**
0.15 to < 0.25	-	-	-	-	-	-	-
0.25 to < 0.50	-	-	-	-	-	-	-
0.50 to < 0.75	-	-	-	-	-	-	-
0.75 to < 2.50	-	-	-	-	-	-	-
2.50 to < 10.00	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-
100.00 (Default)	-	-	-	-	-	-	-
Sub-total	**26**	**0.04**	**1**	**45.0**	**1.00**	**3**	**9**
Bank							
0.00 to < 0.15	**7,153**	**0.05**	**97**	**35.6**	**1.41**	**969**	**14**
0.15 to < 0.25	**168**	**0.22**	**6**	**45.0**	**1.05**	**72**	**43**
0.25 to < 0.50	**124**	**0.37**	**5**	**45.0**	**1.23**	**76**	**61**
0.50 to < 0.75	**577**	**0.63**	**4**	**45.0**	**1.01**	**442**	**77**
0.75 to < 2.50	**8**	**1.65**	**1**	**45.0**	**1.00**	**10**	**112**
2.50 to < 10.00	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-
100.00 (Default)	-	-	-	-	-	-	-
Sub-total	**8,030**	**0.10**	**113**	**36.7**	**1.37**	**1,569**	**20**
Corporates							
0.00 to < 0.15	**372**	**0.11**	**20**	**48.4**	**4.36**	**174**	**47**
0.15 to < 0.25	**45**	**0.22**	**14**	**53.5**	**1.14**	**19**	**42**
0.25 to < 0.50	**60**	**0.37**	**13**	**50.9**	**1.00**	**30**	**50**
0.50 to < 0.75	**88**	**0.63**	**24**	**53.9**	**1.07**	**63**	**71**
0.75 to < 2.50	**363**	**1.38**	**43**	**55.6**	**1.60**	**398**	**110**
2.50 to < 10.00	**30**	**3.46**	**10**	**61.2**	**1.08**	**47**	**155**
10.00 to < 100.00	-	-	-	-	-	-	-
100.00 (Default)	-	-	-	-	-	-	-
Sub-total	**958**	**0.76**	**124**	**52.5**	**2.55**	**731**	**76**
Retail							
0.00 to < 0.15	-	-	-	-	-	-	-
0.15 to < 0.25	-	-	-	-	-	-	-
0.25 to < 0.50	-	-	-	-	-	-	-
0.50 to < 0.75	-	-	-	-	-	-	-
0.75 to < 2.50	-	-	-	-	-	-	-
2.50 to < 10.00	-	-	-	-	-	-	-
10.00 to < 100.00	-	-	-	-	-	-	-
100.00 (Default)	-	-	-	-	-	-	-
Sub-total	-	-	-	-	-	-	-
Total (sum of all portfolios)	**9,014**	**0.17**	**238**	**38.4**	**1.49**	**2,303**	**26**

Note:
Details on the scope of models and percentage of RWA covered by models for each of the regulatory portfolios can be found in the "Credit risk under internal ratings-based approach" section of this document.

The Group has not used IMM(CCR) approach to calculate its default risk exposure.

Counterparty default risk under standardised approach

Table 44: CCR3 – Counterparty default risk exposures (other than those to CCPs) by asset classes and by risk weights – for STC approach

	As at 31 Dec 2018	a	b	c	ca	d	e	f	g	ga	h	i
	Risk weight	**0%**	**10%**	**20%**	**35%**	**50%**	**75%**	**100%**	**150%**	**250%**	**Others**	**Total default risk exposure after CRM**
		HK\$m	**HK\$m**	**HK\$m**	**HK\$m**	**HK\$m**	**HK\$m**	**HK\$m**	**HK\$m**	**HK\$m**	**HK\$m**	**HK\$m**
	Exposure class											
1	Sovereign exposures	-	-	-	-	-	-	-	-	-	-	-
2	PSE exposures	-	-	**5**	-	-	-	-	-	-	-	**5**
2a	*Of which: Domestic PSEs*	-	-	**5**	-	-	-	-	-	-	-	**5**
2b	*Of which: Foreign PSEs*	-	-	-	-	-	-	-	-	-	-	-
3	Multilateral development bank exposures	-	-	-	-	-	-	-	-	-	-	-
4	Bank exposures	-	-	-	-	-	-	-	-	-	-	-
5	Securities firm exposures	-	-	-	-	-	-	-	-	-	-	-
6	Corporate exposures	-	-	-	-	-	-	**313**	-	-	-	**313**
7	CIS exposures	-	-	-	-	-	-	-	-	-	-	-
8	Regulatory retail exposures	-	-	-	-	-	**23**	-	-	-	-	**23**
9	Residential mortgage loans	-	-	-	-	-	-	-	-	-	-	-
10	Other exposures which are not past due exposures	-	-	-	-	-	-	-	-	-	-	-
11	Significant exposures to commercial entities	-	-	-	-	-	-	-	-	-	-	-
12	**Total**	-	-	**5**	-	-	**23**	**313**	-	-	-	**341**

Market risk

Overview and governance

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

There were no significant changes to our policies and practices for the management of market risk in 2018.

Exposure to market risk is separated into two portfolios:

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

– Non-trading portfolios comprise positions that primarily arise from the interest rate management of our retail and commercial banking assets and liabilities, and financial investments designated as fair value through other comprehensive income.

The diagram below illustrates the major trading and non-trading market risk types and market risk measures used to monitor and limit exposures.

	Trading Risk	Non-Trading Risk
Risk Type	- Foreign exchange & Commodities - Interest rates - Credit spreads	- Structural foreign exchange - Interest rates - Credit spreads
Risk Measure	VaR / Sensitivity / Stress testing	VaR / Sensitivity / Stress testing

Where appropriate, the Group applies similar risk management policies and measurement techniques to both trading and non-trading portfolios. The Group's objective is to manage and control market risk exposures in order to optimise return on risk while maintaining a market profile consistent with the status as a professional banking and financial services organisation.

The nature of the hedging and risk mitigation strategies range from the use of traditional market instruments, such as interest rate swaps, to more sophisticated hedging strategies to address a combination of risk factors arising at portfolio level.

Market risk governance

Market risk is managed and controlled through limits approved by the Group's Chief Risk Officer, noting the support of RMM. These limits are allocated across business lines and to the Group's legal entities, including Hang Seng Bank (China) Limited.

The management of market risk is principally undertaken in Global Markets using risk limits allocated from the risk appetite, which is subject to the Board's approval. Limits are set for portfolios, products and risk types where appropriate, with market liquidity and business need being primary factors in determining the level of limits set.

An independent market risk management and control function is responsible for measuring, monitoring and reporting market risk exposures against the prescribed limits on a daily basis.

Market risks arising on each product are transferred to Global Markets for management. Our aim is to ensure that all market risks are consolidated within operations that have the necessary skills, tools, management and governance to manage them.

Our control of market risk in the trading and non-trading portfolios is based on a policy of restricting trading within a list of permissible instruments authorised for each business lines, of enforcing new product approval procedures, and of restricting trading in the more complex derivative products only to business lines with appropriate levels of product expertise and robust control systems.

Market risk measures

Monitoring and limiting market risk exposures

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

Sensitivity analysis

The Group uses 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.

VaR

VaR is a technique that estimates the 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 is calculated for all trading positions regardless of how the Group capitalises those exposures. Where there is no approved internal model, the Group uses the appropriate local rules to capitalise exposures.

In addition, the Group calculates VaR for non-trading portfolios in order to have a complete picture of market risk. Where VaR is not calculated explicitly, alternative tools are used.

Standard VaR is calculated at a 99% confidence level for a one-day holding period while Stressed VaR uses a 10-day holding period and a 99% confidence interval based on a continuous one-year historical significant stress period. The VaR models used by the Group are predominantly based on historical simulation which incorporate the following features:

– historical market rates and prices are calculated with reference to foreign exchange rates and commodity prices, interest rates, equity prices and the associated volatilities;

– potential market movements utilised for Standard VaR are calculated with reference to data from the past two years; and

– Standard VaR is calculated to a 99% confidence level and use a one-day holding period.

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

VaR model limitations

Although a valuable guide to risk, VaR 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% confidence level, by definition does not take into account losses that might occur beyond this level of confidence; and

– VaR is calculated on the basis of exposures outstanding at the close of business and therefore does not necessarily reflect intra-day exposures.

Risk not in VaR ("RNIV") framework

The RNIV framework aims to manage and capitalise material market risks that are not adequately covered in the VaR model. In such instances the RNIV framework uses stress tests to quantify the capital requirement. On average in 2018, the capital requirement derived from these stress tests represented 1.85% of the total internal model-based market risk requirement.

RNIV is not viewed as being a material component of the Group's market risk capital requirement. Risks covered by RNIV represent 1.85% of market risk RWA for models with regulatory approval.

Risk factors are reviewed on a regular basis and either incorporated directly in the VaR models, where possible, or quantified through the VaR-based RNIV approach or a stress test approach within the RNIV framework.

Backtesting

The Group routinely validates the accuracy of the VaR models by back-testing both actual and hypothetical profit and loss against the trading 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. VaR backtesting is performed at Group consolidated and solo levels, including entities that do not have local permission to use VaR for regulatory purposes.

Stress testing

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

Stress testing is implemented at the legal entity and the overall Group levels. Scenarios are tailored in order to capture the relevant events or market movements. A scoring framework is in place for management to effectively assess the severity of the potential stress losses and the likelihood of occurrence of the stress scenarios. The risk appetite around potential stress losses for the Group is set and monitored against referral limits.

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

The market risk stress testing incorporates the historical and hypothetical events.

Stressed VaR and stress testing, together with reverse stress testing, provide management with insights regarding the "tail risk" beyond VaR for which the Group appetite is limited.

Market risk capital models

There are a number of measures that the Group has permission to use in calculating regulatory capital, which are listed below.

For regulatory purposes, the trading book comprises all positions in financial instruments and commodities that are held with trading intent, which are taken with the intention of benefiting from short-term gains or positions where it can be demonstrated that they hedge positions in the trading book.

Positions in the trading book are subject to market risk-based rules, i.e. market risk capital, computed using regulatory approved models. Otherwise,the market risk capital is calculated using the Standardised approach.

VaR

VaR used for regulatory purposes differs from VaR used for management purpose with key differences listed below.

VaR	Regulatory	Management
Scope	Regulatory approval	Broader population of trading and banking book positions
Confidence interval	99%	99%
Liquidity horizon	10-day	1-day
Data set	Past 2 years	Past 2 years

Stressed VaR

Stressed VaR is primarily used for regulatory capital purposes and is integrated into the risk management process to ensure prudent capital management. Stressed VaR complements other risk measures by providing the potential losses under stressed market conditions.

Stressed VaR modelling follows the same approach as our VaR risk measure, except for the following:

– potential market movements employed for stressed VaR calculations are based on a continuous one-year period of stress for the trading portfolio;
– it is calculated to a 99% confidence using a 10-day holding period;
– it is based on an actual 10-day holding period, whereas Regulatory VaR is based on a one-day holding period scaled to 10 days.

Market risk under standardised approach

Using the standard templates as specified by the HKMA, the following tables provide detailed information relating to market risk under STM and IMM approaches.

Table 45: MR1 – Market risk under STM approach

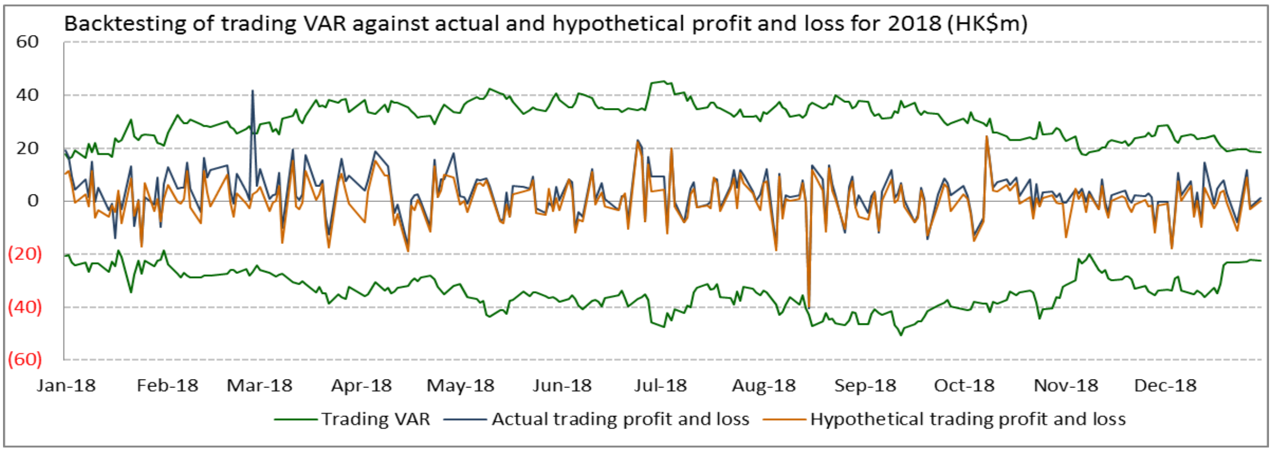
		a
		RWA
	As at 31 Dec 2018	**HK$m**
	Outright product exposures	
1	Interest rate exposures (general and specific risk)	**38**
2	Equity exposures (general and specific risk)	**-**
3	Foreign exchange (including gold) exposures	**-**
4	Commodity exposures	**-**
	Option exposures	
5	Simplified approach	**-**
6	Delta-plus approach	**-**
7	Other approach	**-**
8	Securitisation exposures	**-**
9	**Total**	**38**

Analysis of VaR, stressed VaR and incremental risk charge measures

Table 46: MR3 – IMM approach values for market risk exposures

		a
		Value
As at 31 Dec 2018		**HK$m**
VaR (10 days – one-tailed 99% confidence interval)		
1	Maximum Value	**161**
2	Average Value	**108**
3	Minimum Value	**59**
4	Period End	**64**
Stressed VaR (10 days – one-tailed 99% confidence interval)		
5	Maximum Value	**280**
6	Average Value	**185**
7	Minimum Value	**119**
8	Period End	**136**
IRC (99.9% confidence interval)		
9	Maximum value	-
10	Average value	-
11	Minimum value	-
12	Period end	-
CRC (99.9% confidence interval)		
13	Maximum value	-
14	Average value	-
15	Minimum value	-
16	Period end	-
17	Floor	-

Table 47: MR4 – Comparison of VaR estimates with gains or losses



In 2018, there were three profit exceptions for the Group consolidated level. The profit side exceptions are identified for actual P&L and those are mainly driven by intraday profit arising from trading activities.

The backtesting process applies only to regulatory trading book positions. The actual P&L excludes reserve which are resulted from regulatory banking book positions and also fee and commission which are non-modelled items.

Prudent valuation adjustment

The Group has documented policies and maintains systems and controls for the calculation of Prudent Valuation Adjustment ("PVA"). Prudent value is an estimated conservative pricing with a 90% degree of certainty that would be received to sell an asset or paid to transfer a liability in orderly transactions occurring between market participants at the balance sheet date. The Group's methodology addresses fair value uncertainties arising from a number of sources; market price uncertainty, bid offer ("close out") uncertainty, model risk, concentration, administrative cost, unearned credit spreads and investing and funding costs.

Table 48: PV1 – Prudent valuation adjustments

		a	b	c	d	e	f	g	h
		Equity	**Interest rates**	**FX**	**Credit**	**Commo-dities**	**Total**	**Of which: In the trading book**	**Of which: In the banking book**
As at 31 Dec 2018		**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**	**HK$m**
1	Close-out uncertainty -for which:								
2	Mid-market value	**(22)**	**(74)**	**(3)**	**(1)**	**-**	**(100)**	**(19)**	**(81)**
3	Close-out costs	**-**	**(10)**	**(1)**	**-**	**-**	**(11)**	**(4)**	**(7)**
4	Concentration	**-**	**(22)**	**-**	**-**	**-**	**(22)**	**-**	**(22)**
5	Early termination	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
6	Model risk	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
7	Operational risks	**(2)**	**(9)**	**-**	**-**	**-**	**(11)**	**(2)**	**(9)**
8	Investing and funding costs	**-**	**-**	**(1)**	**-**	**-**	**(1)**	**(1)**	**-**
9	Unearned credit spreads	**(1)**	**(2)**	**-**	**-**	**-**	**(3)**	**(3)**	**-**
10	Future administrative costs	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
11	Other adjustments	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
12	**Total adjustments**	**(25)**	**(117)**	**(5)**	**(1)**	**-**	**(148)**	**(29)**	**(119)**

Liquidity information

The following table displays the LCR and NSFR levels on three reporting bases in accordance with rules 10(1)(a), 10(1)(b) and 11(1) of the BLR:

Table 49: LIQA – LCRs and NSFRs on three liquidity reporting bases

	LCR	**NSFR**
As at 31 Dec 2018	**%**	**%**
Hong Kong Office	**227.2**	**155.5**
Unconsolidated	**219.7**	**153.9**
Consolidated	**214.7**	**154.0**

Information relating to the Group's approach to liquidity risk management, including customised measurement tools and metrics, and details of collateral pools and funding sources is set out in the "Liquidity and funding risk" section in pages 69 to 73 of the Group's 2018 Annual Report. The on- and off- balance sheet items, broken down into maturity buckets are disclosed in Note 22 "Analysis of assets and liabilities by remaining maturity" on the consolidated financial statements in the Group's 2018 Annual Report.

The BLR were introduced by the HKMA in 2014 and became effective from 1 January 2015. The Group is required to calculate its LCR on a consolidated basis in accordance with rule 11(1) of the BLR. During 2018, the Group was required to maintain a LCR of not less than 90%, increasing by 10% to not less than 100% from 1 January 2019.

The average LCR for the period is as follows:

Table 50: Average liquidity coverage ratio

	Quarter ended
	31 Dec 2018
	%
Average liquidity coverage ratio	**209.1**

In accordance with the BLR, the NSFR was implemented in Hong Kong with effect from 1 January 2018. The Group is required to calculate its NSFR on a consolidated basis and maintain a NSFR of not less than 100%.

The liquidity position and funding position of the Group remained strong and stable in 2018.

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

Table 51: Total weighted amount of high quality liquid assets

	Weighted value (average) for the quarter ended
	31 Dec 2018
	HK$m
Level 1 assets	**281,615**
Level 2A assets	**10,920**
Level 2B assets	**546**
Total weighted amount of HQLA	**293,081**

Sources of funding

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

Currency mismatch

The Group allows currency mismatches to provide some flexibility in managing the balance sheet structure and to carry out foreign exchange trading, on the basis that there is sufficient liquidity in the swap market to support currency conversion in periods of stress. The Group sets limits on LCR by currency for all material currencies based on liquidity in the swap markets. These limits are approved and monitored by Asset and Liability Management Committee ("ALCO").

Additional contractual obligations

Most of the Group's derivative transactions are exchange rate contracts and interest rate contracts. Under the terms of our current collateral obligations under derivative contracts (which are ISDA compliant CSA contracts), in the event of one-notch and two-notch downgrade in credit ratings, the additional collateral required to post is immaterial.

A summary of the Group's current policies and practices for the management of liquidity and funding risk is set out in "Liquidity and funding risk" section on pages 69 to 73 of the Group's 2018 Annual Report.

The following table sets out the required disclosure items under the Liquidity Coverage Ratio Standard Disclosure Template as specified by the HKMA. Number of data points used in calculating the average value of the LCR and related components set out in this table for the quarter ended on 31 December 2018 was 75.

Table 52: LIQ1 – Liquidity coverage ratio – for category 1 institution

		Quarter ended 31 Dec 2018 (75 data points)	
		a	b
	Basis of disclosure: consolidated	**Unweighted value (average) HK$m**	**Weighted value (average) HK$m**
A	**High quality liquid assets**		
1	Total high quality liquid assets ("HQLA")		**293,081**
B	**Cash outflows**		
2	Retail deposits and small business funding, of which:	**830,812**	**67,927**
3	*Stable retail deposits and stable small business funding*	***216,489***	***6,495***
4	*Less stable retail deposits and less stable small business funding*	***614,323***	***61,432***
4a	*Retail term deposits and small business term funding*	**-**	**-**
5	Unsecured wholesale funding (other than small business funding) and debt securities and prescribed instruments issued by the institution, of which:	**267,026**	**114,590**
6	*Operational deposits*	***57,458***	***13,594***
7	*Unsecured wholesale funding (other than small business funding) not covered in Row 6*	***209,556***	***100,984***
8	*Debt securities and prescribed instruments issued by the institution and redeemable within the LCR period*	***12***	***12***
9	Secured funding transactions (including securities swap transactions)		**-**
10	Additional requirements, of which:	**82,868**	**11,902**
11	*Cash outflows arising from derivative contracts and other transactions, and additional liquidity needs arising from related collateral requirements*	***3,543***	***3,543***
12	*Cash outflows arising from obligations under structured financing transactions and repayment of funding obtained from such transactions*	***1,092***	***1,092***
13	*Potential drawdown of undrawn committed facilities (including committed credit facilities and committed liquidity facilities)*	***78,233***	***7,267***
14	Contractual lending obligations (not otherwise covered in Section B) and other contractual cash outflows	**20,756**	**20,756**
15	Other contingent funding obligations (whether contractual or non-contractual)	**409,593**	**1,717**
16	Total cash outflows		**216,892**
C	**Cash inflows**		
17	Secured lending transactions (including securities swap transactions)	**1,021**	**-**
18	Secured and unsecured loans (other than secured lending transactions covered in Row 17) and operational deposits placed at other financial institutions	**103,921**	**60,092**
19	Other cash inflows	**25,903**	**16,470**
20	Total cash inflows	**130,845**	**76,562**
D	**Liquidity coverage ratio (adjusted value)**		
21	Total HQLA		**293,081**
22	Total net cash outflows		**140,330**
23	LCR (%)		**209.1%**

Table 53: LIQ2 – Net stable funding ratio – for category 1 institution

		Quarter ended 31 Dec 2018				
		Unweighted value by residual maturity				
	Basis of disclosure: consolidated	No specified term to maturity HK$m	<6 months or repayable on demand HK$m	6 months to < 12 months HK$m	12 months or more HK$m	Weighted amount HK$m
A.	**Available stable funding ("ASF") item**					
1	Capital:	**142,760**	**-**	**-**	**-**	**142,760**
2	*Regulatory capital*	***142,760***	***-***	***-***	***-***	***142,760***
2a	*Minority interests not covered by row 2*	***-***	***-***	***-***	***-***	***-***
3	*Other capital instruments*	***-***	***-***	***-***	***-***	***-***
4	Retail deposits and small business funding:	**-**	**854,080**	**-**	**-**	**779,462**
5	*Stable deposits*		***215,802***	***-***	***-***	***205,012***
6	*Less stable deposits*		***638,278***	***-***	***-***	***574,450***
7	Wholesale funding:	**-**	**358,517**	**10,619**	**903**	**152,301**
8	*Operational deposits*		***57,393***	***-***	***-***	***28,696***
9	*Other wholesale funding*	***-***	***301,124***	***10,619***	***903***	***123,605***
10	Liabilities with matching interdependent assets	-	-	-	-	-
11	Other liabilities:	**18,584**	**35,983**	**218**	**2,014**	**2,123**
12	*Net derivative liabilities*	**-**				
13	*All other funding and liabilities not included in the above categories*	***18,584***	***35,983***	***218***	***2,014***	***2,123***
14	**Total ASF**					**1,076,646**
B.	**Required stable funding ("RSF") item**					
15	Total HQLA for NSFR purposes		**340,594**			**8,800**
16	Deposits held at other financial institutions for operational purposes	-	-	-	-	-
17	Performing loans and securities:	**39,900**	**267,986**	**95,085**	**588,222**	**627,496**
18	*Performing loans to financial institutions secured by Level 1 HQLA*	***-***	***-***	***-***	***-***	***-***
19	*Performing loans to financial institutions secured by non-Level 1 HQLA and unsecured performing loans to financial institutions*	***8***	***73,296***	***1,046***	***6,798***	***18,324***
20	*Performing loans, other than performing residential mortgage, to non-financial corporate clients, retail and small business customers, sovereigns, the Monetary Authority for the account of the Exchange Fund, central banks and PSEs, of which:*	***37,018***	***163,153***	***77,076***	***316,944***	***420,421***
21	*With a risk-weight of less than or equal to 35% under the STC approach*	***13***	***5,165***	***339***	***2,741***	***4,531***
22	*Performing residential mortgages, of which:*	***-***	***6,463***	***6,224***	***253,652***	***178,829***
23	*With a risk-weight of less than or equal to 35% under the STC approach*	***-***	***5,374***	***5,298***	***215,591***	***145,470***
24	*Securities that are not in default and do not qualify as HQLA, including exchange-traded equities*	***2,874***	***25,074***	***10,739***	***10,828***	***9,922***
25	Assets with matching interdependent liabilities	-	-	-	-	-
26	Other assets:	**69,052**	**18,572**	**49**	**1,113**	**59,386**
27	*Physical traded commodities, including gold*	***5,257***				***4,469***
28	*Assets posted as initial margin for derivative contracts and contributions to default funds of CCPs*	***1,019***				***866***
29	*Net derivative assets*	***460***				***460***
30	*Total derivative liabilities before deduction of variation margin posted*	***3,441***				***N/A***
31	*All other assets not included in the above categories*	***58,875***	***18,572***	***49***	***1,113***	***53,591***
32	Off-balance sheet items			**487,873**		**3,407**
33	**Total RSF**					**699,089**
34	**Net Stable Funding Ratio (%)**					**154.0%**

Table 53: LIQ2 – Net stable funding ratio – for category 1 institution (continued)

		Quarter ended 30 Sep 2018				
		Unweighted value by residual maturity				
Basis of disclosure: consolidated		**No specified term to maturity**	**<6 months or repayable on demand**	**6 months to < 12 months**	**12 months or more**	**Weighted amount**
		HK$m	**HK$m**	**HK$m**	**HK$m**	**HK$m**
A.	**Available stable funding ("ASF") item**					
1	Capital:	140,253	-	-	-	140,253
2	*Regulatory capital*	*140,253*	-	-	-	*140,253*
2a	*Minority interests not covered by row 2*	-	-	-	-	-
3	*Other capital instruments*	-	-	-	-	-
4	Retail deposits and small business funding:	-	826,271	-	-	754,445
5	*Stable deposits*		*216,026*	-	-	*205,225*
6	*Less stable deposits*		*610,245*	-	-	*549,220*
7	Wholesale funding:	-	347,088	5,933	791	141,192
8	*Operational deposits*		*55,056*	-	-	*27,528*
9	*Other wholesale funding*	-	*292,032*	*5,933*	*791*	*113,664*
10	Liabilities with matching interdependent assets	-	-	-	-	-
11	Other liabilities:	19,965	17,583	298	1,996	2,145
12	*Net derivative liabilities*	-				
13	*All other funding and liabilities not included in the above categories*	*19,965*	*17,583*	*298*	*1,996*	*2,145*
14	**Total ASF**					1,038,035
B.	**Required stable funding ("RSF") item**					
15	Total HQLA for NSFR purposes		279,098			7,322
16	Deposits held at other financial institutions for operational purposes	-	-	-	-	-
17	Performing loans and securities:	36,739	282,044	102,264	577,392	620,150
18	*Performing loans to financial institutions secured by Level 1 HQLA*	-	-	-	-	-
19	*Performing loans to financial institutions secured by non-Level 1 HQLA and unsecured performing loans to financial institutions*	*8*	*89,991*	*2,255*	*5,934*	*20,568*
20	*Performing loans, other than performing residential mortgage, to non-financial corporate clients, retail and small business customers, sovereigns, the Monetary Authority for the account of the Exchange Fund, central banks and PSEs, of which:*	*33,685*	*155,029*	*82,737*	*309,874*	*410,342*
21	*With a risk-weight of less than or equal to 35% under the STC approach*	*7*	*4,087*	*85*	*2,767*	*3,878*
22	*Performing residential mortgages, of which:*	-	*6,206*	*6,699*	*247,399*	*179,200*
23	*With a risk-weight of less than or equal to 35% under the STC approach*	-	*4,795*	*4,713*	*187,706*	*126,763*
24	*Securities that are not in default and do not qualify as HQLA, including exchange-traded equities*	*3,046*	*30,818*	*10,573*	*14,185*	*10,040*
25	Assets with matching interdependent liabilities	-	-	-	-	-
26	Other assets:	68,096	14,558	22	1,150	58,293
27	*Physical traded commodities, including gold*	*4,407*				*3,746*
28	*Assets posted as initial margin for derivative contracts and contributions to default funds of CCPs*	*1,093*				*929*
29	*Net derivative assets*	*802*				*802*
30	*Total derivative liabilities before deduction of variation margin posted*	*3,870*				*N/A*
31	*All other assets not included in the above categories*	*57,924*	*14,558*	*22*	*1,150*	*52,816*
32	Off-balance sheet items			482,794		4,022
33	**Total RSF**					689,787
34	**Net Stable Funding Ratio (%)**					150.5%

Other disclosures

Interest rate exposures in the banking book

Interest rate risk in the banking book is the risk of an adverse impact to earnings or capital due to changes in market interest rates. The risk arises from timing mismatches in the re-pricing of non-traded assets and liabilities and is the potential adverse impact of changes in interest rates on earnings and capital.

In its management of the risk, the Group aims to mitigate the impact of future interest rate movements which could reduce future net interest income, while balancing the cost of hedging activities to the current revenue stream. Monitoring the sensitivity of projected net interest income and economic value of equity ("EVE") under varying interest rate scenarios is a key part of this.

In order to manage structural interest rate risk, non-traded assets and liabilities are transferred to Balance Sheet Management ("BSM") based on their re-pricing and maturity characteristics. For assets and liabilities with no defined maturity or re-pricing characteristics, behaviouralisation is used to assess the interest rate risk profile. BSM manages the banking book interest rate positions transferred to it within the approved limits. The ALCO is responsible for monitoring and reviewing its overall structural interest rate risk position. Interest rate behaviouralisation policies have to be formulated in line with the Group's behaviouralisation policies and approved at least annually by ALCO.

Quantitative Disclosure

An EVE Sensitivity is the extent to which the EVE will change due to a pre-specified movement in interest rates, where all other economic variables are held constant. The EVE sensitivity shown below is indicative and based on scenario and assumptions prescribed by HKMA under completion instruction for the Return of Interest Rate Risk Exposures (MA(BS)12), which is completed and reported quarterly on solo basis according to MA(BS)12. The HKMA applies a standardised 200-basis-point parallel rate shock* to institutions' interest rate risk exposures to measure the EVE impact of the shock.

All the positions captured by this return are slotted into the appropriate time bands according to the earliest interest repricing date (as per MA(BS)12).

* Multiplying the net position by the corresponding weighting factors which are designed to reflect the sensitivity of positions in different time bands to an assumed parallel shift of 200 basis points throughout the time spectrum.

Table 54: IRRBB – Sensitivity analysis

		Economic value sensitivity[2]			
		Material Currencies			
		Hong Kong dollar ("HKD")	**US dollar ("USD")**	**Chinese Renminbi ("RMB")**	**Total**
As at 31 Dec 2018	*Footnote*	**HK$m**	**HK$m**	**HK$m**	**HK$m**
Parallel up		**1,316**	**312**	**29**	**1,657**
Total Capital Base	*1*				**110,734**

1 The Total Capital Base is as of 31 December 2018.

2 The EVE sensitivity is reported on solo basis according to the Return of Interest Rate Risk Exposures (MA(BS)12) submitted to the HKMA.

Mainland activities exposures

The analysis of mainland activities exposures is based on the categories of non-bank counterparties and the type of direct exposures defined by the HKMA "Return of Mainland Activities - (MA(BS)20)". This includes the mainland activities exposures extended by the Bank's Hong Kong offices and its wholly owned banking subsidiary in mainland China.

Table 55: Mainland activities exposures

As at 31 Dec 2018	On-balance sheet exposure HK$m	Off-balance sheet exposure HK$m	Total exposures HK$m
Type of Counterparties			
1 Central government, central government-owned entities and their subsidiaries and joint ventures ("JVs")	**47,176**	**3,212**	**50,388**
2 Local governments, local government-owned entities and their subsidiaries and JVs	**15,588**	**2,310**	**17,898**
3 PRC nationals residing in Mainland China or other entities incorporated in Mainland China and their subsidiaries and JVs	**83,426**	**27,289**	**110,715**
4 Other entities of central government not reported in item 1 above	**7,507**	**1,541**	**9,048**
5 Other entities of local governments not reported in item 2 above	**4,320**	**634**	**4,954**
6 PRC nationals residing outside Mainland China or entities incorporated outside Mainland China where the credit is granted for use in Mainland China	**32,408**	**1,571**	**33,979**
7 Other counterparties where the exposures are considered by the reporting institution to be non-bank Mainland China exposures	**14,059**	**417**	**14,476**
Total	**204,484**	**36,974**	**241,458**
Total assets after provision	**1,435,631**		
On-balance sheet exposures as percentage of total assets	**14.24%**		

On-balance sheet exposures as percentage of total assets remained stable as compared with 30 June 2018.

International claims

The Group's country risk exposures in the table below are prepared in accordance with the HKMA "Return of International Banking Statistics - (MA(BS)21)" guidelines. International claims are on-balance sheet exposures to counterparties based on the location of the counterparties after taking into account the transfer of risk, and represent the sum of cross-border claims in all currencies and local claims in foreign currencies.

The table shows claims on individual countries and territories or areas, after recognised risk transfer, amounting to not less than 10% of the Group's total international claims.

Table 56: International claims

As at 31 Dec 2018	Banks HK$m	Official Sector HK$m	Non Bank Financial Institution HK$m	Non-Financial Private Sector HK$m	Others HK$m	Total HK$m
Developed countries	**47,929**	**46,164**	**14,222**	**47,922**	**-**	**156,237**
Offshore centres	**4,442**	**10,482**	**6,099**	**112,449**	**-**	**133,472**
of which : Hong Kong SAR	**3,118**	**1,339**	**5,457**	**95,631**	**-**	**105,545**
Developing Asia and Pacific	**79,487**	**11,747**	**9,419**	**75,359**	**-**	**176,012**
of which : China	**55,209**	**11,678**	**8,343**	**68,138**	**-**	**143,368**

At 31 December 2018, only claims on Hong Kong SAR and China were the individual countries and territories or areas, which were not less than 10% of the Group’s total international claims.

Foreign exchange exposure

The Group's foreign exchange exposures mainly comprise foreign exchange dealing by Global Markets and currency exposures originated by its banking business. The latter are transferred to Global Markets where they are centrally managed within foreign exchange position limits approved by the Group's Chief Risk Officer, noting the support of RMM. The net options position is calculated on the basis of delta-weighted positions of all foreign exchange options contracts.

The Group's structural foreign exchange exposure, monitored using sensitivity analysis, represents the Group's foreign currency investments in subsidiaries, branches and associates, and the fair value of the Group's certain long-term foreign currency equity investments. The Group's structural foreign exchange exposures are managed by the Group's ALCO with the primary objective of ensuring, where practical, that the Group's and the Bank's capital ratios are largely protected from the effect of changes in exchange rates.

The Group's foreign exchange exposures in the table below is prepared in accordance with the HKMA "Return of Foreign Currency Position - (MA(BS)6)".

At 31 December 2018, the USD, RMB and New Zealand dollar ("NZD") were the currencies in which the Group had non-structural foreign currency positions that were not less than 10% of the total net position in all foreign currencies. The Group also had a RMB structural foreign currency position, which was not less than 10% of the total net structural position in all foreign currencies.

The table below summarise the net structural and non-structural foreign currency positions of the Group.

Table 57: Foreign exchange exposure

As at 31 Dec 2018	USD HK$m	RMB HK$m	NZD HK$m	Other foreign currencies HK$m	Total foreign currencies HK$m
Non-structural position					
Spot assets	**188,061**	**106,361**	**1,973**	**114,479**	**410,874**
Spot liabilities	**(197,161)**	**(109,797)**	**(4,345)**	**(67,537)**	**(378,840)**
Forward purchases	**360,739**	**132,550**	**4,122**	**25,888**	**523,299**
Forward sales	**(349,362)**	**(130,604)**	**(1,614)**	**(72,687)**	**(554,267)**
Net options position	**110**	**(149)**	**(29)**	**30**	**(38)**
Net long/(short) non-structural position	**2,387**	**(1,639)**	**107**	**173**	**1,028**
Structural position	**-**	**14,755**	**-**	**1,212**	**15,967**

Other information

Abbreviations

A	
AI	Authorised institution
ALCO	Asset and Liability Management Committee
ASF	Available stable funding
AT1	Additional tier 1
AVAs	Additional valuation adjustments
B	
Bank	Hang Seng Bank Limited
BCBS	Basel Committee on Banking Supervision
BCR	Banking (Capital) Rules
BDR	Banking (Disclosure) Rules
BLR	Banking (Liquidity) Rules
BSC	Basic approach
BSM	Balance Sheet Management
C	
CCF	Credit conversion factor
CCP	Central counterparty
CCR	Counterparty credit risk
CCyB	Countercyclical capital buffer
CEM	Current exposure method
CET1	Common equity tier 1
CF	Commodities finance
CIS	Collective investment scheme
CRC	Comprehensive risk charge
CRM	Credit risk mitigation
CSA	Credit support annex
CVA	Credit valuation adjustment
D	
D-SIB	Domestic systemically important authorised institution
DTAs	Deferred tax assets
E	
EAD	Exposure at default
ECAI	External Credit Assessment Institution
EL	Expected loss
EPE	Expected positive exposure
EVE	Economic value of equity
F	
FBA	Fall-back approach
FFVA	Funding fair value adjustment
FX	Foreign Exchange
G	
G-SIB	Global systemically important authorised institution
Group	Hang Seng Bank Limited together with its subsidiaries
H	
HK$bn	Billions (thousands of millions) of Hong Kong dollars
HK$m	Millions of Hong Kong dollars
HKAS	Hong Kong Accounting Standard
HKD	Hong Kong dollar
HKMA	Hong Kong Monetary Authority
HKFRS	Hong Kong Financial Reporting Standards
Hong Kong	The Hong Kong Special Administrative Region of the People's Republic of China
HSBC	HSBC Holdings together with its subsidiary undertakings
HVCRE	High-volatility commercial real estate
HQLA	High quality liquid assets
I	
IMM	Internal models approach
IMM(CCR)	Internal models (counterparty credit risk) approach
IPRE	Income-producing real estate
IRB	Internal ratings-based approach
IRC	Incremental risk charge
ISDA	International Swaps and Derivatives Association
J	
JCCyB	Jurisdictional countercyclical capital buffer
JVs	Joint ventures
L	
LCR	Liquidity coverage ratio
LGD	Loss given default
LR	Leverage ratio
LTA	Look through approach
M	
MBA	Mandate-based approach
MOC	Model Oversight Committee
MSRs	Mortgage servicing rights
N	
N/A	Not applicable
NBFI	Non-Bank Financial Institution
NSFR	Net stable funding ratio
NZD	New Zealand dollar
O	
OBS	Off-balance sheet
OF	Object finance
OTC	Over-the-counter
P	
P&L	Profit and loss
PD	Probability of default
PF	Project finance
PFE	Potential future exposure
PRA	Prudential Regulation Authority
PRC	People's Republic of China
PSE	Public sector entity
PVA	Prudent valuation adjustment
PVIF	Present value of in-force long-term insurance business
Q	
QRRE	Qualifying revolving retail exposures
R	
RAS	Risk Appetite Statement
RBWM	Retail Banking and Wealth Management
RC	Replacement cost
RMB	Chinese Renminbi
RMM	Risk Management Meeting
RNIV	Risk not in VaR
RSF	Required stable funding
RW	Risk-weight
RWA	Risk-weighted asset/risk-weighted amount
S	
SA-CCR	Standardised approach for counterparty credit risk
SEC-ERBA	Securitisation external ratings-based approach
SEC-FBA	Securitisation fall-back approach
SEC-IRBA	Securitisation internal ratings-based approach
SEC-SA	Securitisation standardised approach
SFT	Securities financing transaction
SME	Small and medium-sized enterprises
SRW	Supervisory risk-weight
STC	Standardised (credit risk) approach
STM	Standardised (market risk) approach
U	
USD	US dollar
V	
VaR	Value at risk
W	
WCMR	Wholesale Credit and Market Risk